66th FMHS Annual Academic Day

31 August 2022-01 September 2022

66ste FGGW Akademiese Jaardag

31 Augustus 2022-01 September 2022

PROGRAMME / PROGRAM

FOREWORD

The Faculty of Medicine and Health Sciences of Stellenbosch University has a long and proud history of medical and health sciences research which stretches over a period of more than 65 years. The Annual Academic Day has always acted as a showcase of the groundbreaking research that we perform in this Faculty, and we regard it as a day of celebration, not only of our achievements and research excellence, but also of the positive impact that we have on the world around us. As the world is slowly returning to normal after two years of the COVID-19 pandemic, the Faculty has decided to return to an in-person meeting for this year's 66th Annual Academic Day, keeping the format of two afternoons. We are proud of the fact that we were able to keep on hosting the AAD throughout the pandemic, albeit in virtual format, but feel convinced that we should now return to the traditional format to encourage in-person interaction and networking.

Despite the challenges that we face, our Faculty's research enterprise has never been on a stronger footing. Our research outputs increased by more than 160% over the last 10 years, we have never had so many students graduating with PhDs, never had so much research grant funding and with exciting developments like the Biomedical Research Institute, the Node for Infection Imaging, the FMHS Biorepository, health data science initiatives and others, the future appears bright. As Vice Dean of Research and Internationalisation I would like to thank each and every staff member, postdoctoral fellow and student who made this happen. Our institution has made a commitment to being a university that is relevant to its context and is of service to our country and continent, a commitment that is underscored by our desire to solve the pressing problems and challenges that we encounter on this continent, and to unlock the incredible potential of our people. Our research does have a tremendous and immeasurably positive impact on society, as can be witnessed by the many positive stories of the people that we care for, and the policies, practices and procedures in health care which we have been able to influence over the years.

With an exciting line up of state-of-the-art speakers and a world-renowned leader in health focused on addressing disparities in health care and research capacity globally, Dr Patrice Matchaba, M.D, Head of US Corporate Responsibility and President, Novartis US Foundation, as our Guest Speaker for 2022, this year's event promises to be as exciting and stimulating as ever. We are looking forward to an in-person event again where all participants can meet, network, collaborate and be inspired by the outstanding research done at the Faculty of Medicine and Health Sciences of Stellenbosch University. I invite you all to share and enjoy this special event with us.

Professor Nico C Gey Van Pittius, Vice Dean: Research And Internationalisation

VOORWOORD

Die Fakulteit Geneeskunde en Gesondheidswetenskappe van die Universiteit Stellenbosch het 'n lang en trotse geskiedenis van mediese en gesondheidswetenskaplike navorsing wat oor 'n tydperk van meer as 65 jaar strek. Die Akademiese Jaardag het nog altyd gedien as 'n vertoonvenster van die baanbrekende navorsing wat ons in hierdie Fakulteit doen, en ons beskou dit as 'n dag van viering, nie net van ons prestasies en navorsingsuitnemendheid nie, maar ook van die positiewe impak wat ons op die wêreld om ons. Aangesien die wêreld ná twee jaar van die COVID-19-pandemie stadigaan na normaal terugkeer, het die Fakulteit besluit om terug te keer na 'n persoonlike vergadering vir vanjaar se 66ste Jaarlikse Akademiese Dag, met die behoud van die formaat van twee middae. Ons is trots op die feit dat ons kon aanhou om die AJD deur die hele pandemie aan te bied, al is dit in virtuele formaat, maar voel oortuig dat ons nou moet terugkeer na die tradisionele formaat om persoonlike interaksie en netwerke aan te moedig.

Ten spyte van die uitdagings wat ons in die gesig staar, was ons Fakulteit se navorsingsonderneming nog nooit op 'n sterker voet nie. Ons navorsingsuitsette het oor die afgelope 10 jaar met meer as 160% toegeneem, ons het nog nooit soveel studente gehad wat met PhD's gegradueer het nie, nog nooit soveel navorsingsbefondsing gehad nie en met opwindende ontwikkelings soos die Biomediese Navorsingsinstituut, die Node vir Infeksiebeelding, die FGGW Biobank, gesondheidsdatawetenskap-inisiatiewe en ander, lyk die toekoms blink. As Visedekaan van Navorsing en Internasionalisering wil ek elke personeellid, nadoktorale genoot en student bedank wat dit laat gebeur het. Ons instelling het 'n verbintenis gemaak om 'n universiteit te wees wat relevant is tot sy konteks en tot diens is vir ons land en kontinent, 'n verbintenis wat onderstreep word deur ons begeerte om die dringende probleme en uitdagings wat ons op hierdie kontinent teëkom, op te los, en om die ongelooflike potensiaal van ons mense te ontsluit. Ons navorsing het wel 'n geweldige en onmeetlik positiewe impak op die samelewing, soos gesien kan word deur die baie positiewe stories van die mense vir wie ons omgee, en die beleide, praktyke en prosedures in gesondheidsorg wat ons oor die jare kon beïnvloed .

Met 'n opwindende reeks spiespunt sprekers en 'n wêreldbekende leier in gesondheid wat daarop gefokus is om ongelykhede in gesondheidsorg en navorsingskapasiteit wêreldwyd aan te spreek, Dr Patrice Matchaba, M.D., Hoof van "US Corporate Responsibility" en President, Novartis US Foundation, as ons Gasspreker vir 2022, beloof vanjaar se geleentheid om net so opwindend en stimulerend te wees soos altyd. Ons sien weer uit na 'n persoonlike geleentheid waar alle deelnemers kan ontmoet, netwerk, saamwerk en geïnspireer kan word deur die uitstaande navorsing wat by die Fakulteit Geneeskunde en Gesondheidswetenskappe van die Universiteit Stellenbosch gedoen is. Ek nooi julle almal uit om hierdie spesiale geleentheid saam met ons te deel en te geniet.

Professor Nico C Gey Van Pittius, Visedekaan: Navorsing en Internasionalisering

THE FMHS WOULD LIKE TO EXPRESS ITS SINCERE APPRECIATION TO THE FOLLOWING COMPANIES FOR THEIR PARTICIPATION AND FINANCIAL SUPPORT /

DIE FGGW WIL GRAAG SY DANK EN WAARDERING UITSPREEK AAN DIE VOLGENDE MAATSKAPPYE VIR HULLE DEELNAME EN FINANSIËLE ONDERSTEUNING

Discovery Foundation

Inqaba Biotec

Nedbank

PerkinElmer South Africa

Whitehead Scientific

Programme Overview / Program Oorsig

66th ANNUAL ACADEMIC DAY 2022 / 66ste AKADEMIESE JAARDAG 2022

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

12h00-12h45: ***Lunch and Posters*** (Foyer between Lecture Hall 11 and 12)

Main Programme / Hoofprogram (Lecture Hall 11 / Voorlesingsaal 11)

Chair / Voorsitter: *Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)*

12h45-12h55:	Opening and welcome - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)
12h55-13h15:	Dean's Address – Prof Elmi Muller (Dean, Faculty of Medicine and Health Sciences, Stellenbosch University)
13h15-13h20:	Handing over of the HD Brede Awards for TB Research and the Faculty Awards for Excellence in a Master's programme - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)
13h20-13h30:	Introduction of Guest Speaker - Prof Elmi Muller
13h30-14h15:	Guest Speaker (see page 8) – Dr Patrice Matchaba, President, Novartis US Foundation and Novartis US Head for Corporate Responsibility. Presentation title: "*A new urgency and Perspective about Global and Human Health*"

14h15-14h45: ***Tea/Coffee and Posters*** (Foyer between Lecture Hall 11 and 12)

Afternoon Parallel Sessions / Namiddag Parallelle Sessies

14h45-18h00:	Infectious Diseases (Session 1)	Lecture Hall 11	p18
14h45-18h00:	Non-Communicable diseases (Session 1)	Lecture Hall 5	p22
14h45-16h45:	Global Health, Public Health and Health Systems (Session 1)	Lecture Hall 7	p25
14h45-18h00:	Violence, Injuries, Trauma and Rehabilitation (Session 1)	Lecture Hall 6	p28
14h45-18h00:	Perioperative Sciences (Session 1)	Lecture Hall 8	p30
14h45-18h00:	Maternal and Child Health (Session 1)	Lecture Hall 12	p32

Thursday 01 September 2022 / Donderdag 01 September 2022

12h00-12h45: ***Light Lunch and Posters*** (Foyer between Lecture Hall 11 and 12)

Lunch Parallel Sessions / Middagete Parallelle Sessies

12h45-14h15:	Infectious Diseases (Session 2)	Lecture Hall 11	p20
12h45-14h15:	Non-Communicable diseases (Session 2)	Lecture Hall 5	p24
12h45-14h15:	Global Health, Public Health and Health Systems (Session 2)	Lecture Hall 7	p26
12h45-14h15:	Health Professions Education (Session 1)	Lecture Hall 6	p36
14h45-14h15:	Mental Health and Neurosciences (Session 1)	Lecture Hall 8	p38
12h45-14h15:	Maternal and Child Health (Session 2)	Lecture Hall 12	p34

14h15-14h45: ***Tea/Coffee and Posters*** (Foyer between Lecture Hall 11 and 12)

Afternoon Parallel Sessions / Namiddag Parallelle Sessies

14h45-17h00:	Infectious Diseases (Session 3)	Lecture Hall 11	p20
14h45-16h15:	Primary Healthcare (Session 1)	Lecture Hall 7	p40
14h45-17h00:	Health Professions Education (Session 2)	Lecture Hall 6	p37
14h45-16h30:	Mental Health and Neurosciences (Session 2)	Lecture Hall 8	p39
14h45-17h00:	Maternal and Child Health (Session 3)	Lecture Hall 12	p34

State of the Art Lectures / Spiespuntvoordragte

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

14h45 - 15h15: **State of the Art Lecture 1** – Infectious Diseases (Lecture Hall 11)
Prof Brian Allwood (Division of Pulmonology, Department of Medicine)
Title: "*Post-TB Lung Disease: Of Ostriches, Elephants and Advocates*"

15h30 - 16h00: **State of the Art Lecture 2** – Violence, Injuries, Trauma and Rehabilitation (Lecture Hall 6)
Dr Xanthe Hunt (Institute for Life Course Health Research, Department of Global Health)
Title: "*Violence against people with disabilities: What it looks like, where it happens, and how to prevent it*"

16h15 - 16h45: **State of the Art Lecture 3** – Perioperative Sciences (Lecture Hall 8)
Dr Nadiya Ahmed (Division of Surgery, Department of Surgical Sciences)
Title: "*Robodoc - bringing the ICU to you*"

Thursday 01 September 2022 / Donderdag 01 September 2022

12h45 - 13h15: **State of the Art Lecture 4** – Non-Communicable Diseases (Lecture Hall 5)
Prof Shahida Moosa (Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences)
Title: "*Genomics in Africa: lessons from the Undiagnosed Disease Programme*"

13h45 - 14h15: **State of the Art Lecture 5** – Global Health, Public Health and Health Systems (Lecture Hall 7)
Prof Peter Nyasulu (Division of Epidemiology and Biostatistics, Department of Global Health)
Title: "*Lingering Shock Waves of COVID-19 Pandemic: A Global Health Perspective*"

14h45 - 15h15: **State of the Art Lecture 6** – Health Professions Education (Lecture Hall 6)
Prof Cecilia Jacobs (Centre for Health Professions Education)
Title: "*Health Professions Education – whence and whither?*"

15h30 - 16h00: **State of the Art Lecture 7** – Mental Health and Neurosciences (Lecture Hall 8)
Dr Lebogang Phahladira (Department of Psychiatry)
Title: "*Improving long-term treatment outcomes for schizophrenia: the South African experience*"

16h15 - 16h45: **State of the Art Lecture 8** – Maternal and Child Health (Lecture Hall 12)
Prof Pierre Goussard (Department of Paediatrics and Child Health)
Title: "*Pediatric bronchoscopy : The role of an expensive toy in the developing world"*

GUEST SPEAKER / GASSPREKER

Dr Patrice Matchaba

BSc (Lesotho), MBBS (with honors – Zimbabwe), FCOG (SA), DSc Honoris Causa (Stellenbosch)

Title: "A new urgency and Perspective about Global and Human Health"

Dr Patrice Matchaba *is the President, Novartis US Foundation and Novartis US Head for Corporate Responsibility. He has held the role of President since Feb 2021, and has been working for Novartis Global for 22 years. Prior to that he was the Novartis Group Head of Global Health and Corporate Responsibility (GH&CR) from 2017-2021. Other previous roles in Novartis included Global Head of Cardiometabolic Drug Development Unit, Transplantation, Immunology, Dermatology and Global Head of Drug Safety and Epidemiology. Prior to joining Novartis, Patrice ran a practice in Obstetrics and Gynecology in South Africa and worked at the Medical Research Council in Cape Town; teaching systematic reviews and meta-analysis methodologies. Patrice was born in Zimbabwe, is a citizen of both South Africa and the USA, a resident of Barcelona and lives in New Jersey, USA with his family. His current interests and responsibility at Novartis are the sustainable Integration of ESG – Material issues into the Core Business through innovation and technology. Examples while he was Group Head of Health and CR are:*

- *Rolling out the "Medicines Access Principles "throughout the R&D Process to deliver innovative medicines in Low- and Middle-income countries within a year of them being available i the US/EU – resulting on Novartis being ranked from 7th to 2nd by the Access to Medicines Index*
- *Building innovative sustainable "Ecosystem-Partnerships" to treat sickle cell disease in Africa, Chaga's Disease in South America*
- *Launching the first Sustainability Bond linked to innovative medicines access in LMIC*

In his current role in the US, he formed a first of its kind partnership called the "Beacon of Hope" with several groups, including 27 Historically Black Colleges/Medical Schools and other partners to tackle Health Inequity in populations of color made worse by the Covid pandemic in the US, by integrating D&I throughout the R&D Pharma Ecosystem. In April 2022 he received an Honorary Doctorate from the University of Stellenbosch for his outstanding contributions to pharmaceutical and clinical science, and his leadership role in addressing disparities in health care and research capacity globally.

State of the Art Lecturers / Spiespuntvoordrag Aanbieders

State of the Art Lecture 1

Prof Brian Allwood
(Division of Pulmonology, Department of Medicine)

Title: "*Post-TB Lung Disease: Of Ostriches, Elephants and Advocates"*

Prof Brian Allwood *is an Associate Professor in the Division of Pulmonology at Stellenbosch University and Tygerberg Hospital. He received his medical degree from the University of the Witwatersrand, and completed his training as a specialist physician and pulmonologist at the University of Cape Town (UCT). He has also attained a Master's Degree in Public Health (Clinical Research), and completed a PhD evaluating the link between tuberculosis and subsequent development of chronic obstructive pulmonary disease. He initiated, and heads, both the multidisciplinary interstitial lung disease and pulmonary hypertension service at Tygerberg Hospital, and was awarded the Discovery Foundation Fellowship to Massachusetts General Hospital/Harvard (Boston, USA) in 2017, where he obtained clinical training in pulmonary vascular diseases. On his return in June 2018, in addition to his role as a general pulmonologist, he has advocated for and expanded the clinical pulmonary hypertension service within his institution. In 2019, he chaired the steering committee for the 1st International Post-TB Symposium, which was hosted in Stellenbosch. In the same year, he initiated a post-tuberculosis lung disease service at Tygerberg Hospital, thought to be the first such service in the world. Apart from running the clinical interstitial lung disease and pulmonary hypertension services, his current research interests include post-TB lung disease (PTLD), and in particular, the pulmonary vascular effects after tuberculosis. He remains committed to teaching and training in pulmonology, and in particular the training of pulmonologists for the African context, as well as addressing respiratory problems relevant to Africa and South Africa. .*

State of the Art Lecture 2

Dr Xanthe Hunt
(Institute for Life Course Health Research, Department of Global Health)

Title: "*Violence against people with disabilities: What it looks like, where it happens, and how to prevent it"*

Dr Xanthe Hunt *is a Senior Researcher at the Institute for Life Course Health Research in the Department of Global Health at Stellenbosch University. Her research focuses on mental health, disability, and child development in low- and middle-income settings. Dr Hunt has a PhD in Psychology from Stellenbosch University, and postgraduate training from Harvard Medical School. She currently leads a large-scale study on student mental health in South Africa, as well as a number of projects related to disability-inclusive development. She collaborates extensively with the World Health Organisation on work related to disability, and is on the secretariat of the forthcoming WHO-UNICEF Global Report on Developmental Disabilities.*

State of the Art Lecture 3

Dr Nadiya Ahmed
(Division of Surgery, Department of Surgical Sciences)

Title: *"Robodoc - bringing the ICU to you"*

Dr Nadiya Ahmed *is a General Surgeon and Intensive Care Specialist at Tygerberg Hospital and the Division of Surgery in the Department of Surgical Sciences of Stellenbosch University. In addition to being involved in many educational activities at Tygerberg Hospital/Stellenbosch University, she also is an active member of the Tygerberg Hospital Antibiotic Stewardship Committee, Tygerberg Hospital Pharmacy Therapeutics Committee and the Western Cape Provincial Critical Care Forum. Her current focus and research interests include nutrition in the critically ill, source control and antimicrobial therapy, critical care education and telematics in critical care.*

State of the Art Lecture 4

Prof Shahida Moosa
(Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences)

Title: *"Genomics in Africa: lessons from the Undiagnosed Disease Programme"*

Prof Shahida Moosa *is an internationally-trained clinician-scientist and an Associate Professor in the Division of Molecular Biology and Human Genetics at the University of Stellenbosch. She is a senior medical geneticist at Tygerberg Hospital and combines her knowledge and skills of clinical genomics, bioinformatics, molecular biology and molecular genomics to lead the Rare Disease Genomics in South Africa research group at SU. After completing her specialty training at Wits University, she obtained her PhD at the University of Cologne, Germany (summa cum laude), followed by a postdoctoral fellowship at Harvard Medical School and Boston Children's Hospital. Prof Moosa is very passionate about bringing genomics to Africa and using these technologies to benefit African patients, especially those who are still undiagnosed. In 2021, Shahida established sub-Saharan Africa's first Undiagnosed Disease Programme (UDP). The UDP is transforming patient lives and providing unique opportunities for capacity building and training for the next generation of genomics experts in southern Africa.*

State of the Art Lecture 5

Prof Peter Nyasulu
(Division of Epidemiology and Biostatistics, Department of Global Health)

Title: *"Lingering Shock Waves of COVID-19 Pandemic: A Global Health Perspective"*

Prof Peter Suwirakwenda Nyasulu *is a Professor of Epidemiology and Biostatistics at Stellenbosch University's Faculty of Medicine and Health Sciences. He is a member of the American College of Epidemiology and an Honorary Associate Professor of Epidemiology at the School of Public Health, Faculty of Health Sciences, University of the Witwatersrand. He has extensive experience in clinical and public health research with special research interest in control of infectious diseases in LMICs, as well as enhancing medical education as a catalyst for skills development in disease control and management. He holds a PhD in Infectious Diseases Epidemiology, a Master of Science degree in Medicine in the field of Epidemiology and Biostatistics obtained from the School of Public Health (Wits), a Postgraduate Diploma in Epidemiology obtained from London School of Hygiene and Tropical Medicine, an Advanced Diploma in Dermato-venereology from the University of Dar-es-Salaam and a Diploma in Clinical Medicine (Cum Laude), College of Health Sciences (Malawi). Prof Nyasulu is a C-rated scientist, with an h-index of 24, and over 100 publications in peer reviewed international journals. He has supervised and graduated over 50 postgraduate students. He has an extensive network of research collaboration both locally and internationally and has over the years won multiple research grants with, inter alia, the Welcome Trust, the NRF, NIH, and MRC. He is currently actively involved in the COVID-19 research response initiative of Stellenbosch University. He is a peer reviewer of many journals and serves on the Editorial Boards of BMC Infectious Diseases and the Malawi Medical Journal. His publication record can be accessed at https://scholar.google.com/citations?user=X2JsbpQAAAAJ&hl=en.*

State of the Art Lecture 6

Prof Cecilia Jacobs
(Centre for Health Professions Education)

Title: *"Health Professions Education – whence and whither?"*

Prof Cecilia Jacobs *is an Associate Professor in Higher Education at the Centre for Health Professions Education in the Faculty of Medicine and Health Sciences of Stellenbosch University. Her field of expertise is higher education studies, and she has worked predominantly in the area of the professionalisation of academics for their teaching roles. Her work has been of a transdisciplinary nature, and she has always conducted research at the intersection of her field and other disciplines, such as engineering and, currently, health sciences. Her current research focuses on the question of knowledge and the importance of its centrality in debates on higher education teaching and learning.*

State of the Art Lecture 7

Dr Lebogang Phahladira
(Department of Psychiatry)

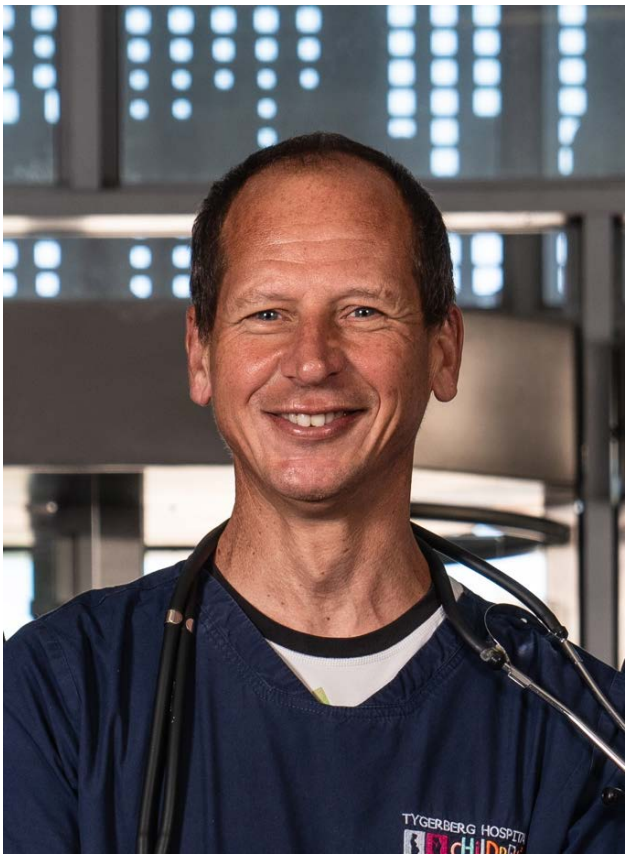
Title: *"Improving long-term treatment outcomes for schizophrenia: the South African experience"*

Dr Lebogang Phahladira, *MBChB, DMH(SA), FCPsych (SA), PhD(Stell), is a Specialist Psychiatrist and Senior Lecturer in the Department of Psychiatry at Stellenbosch University's Faculty of Medicine and Health Sciences. Dr Phahladira was born and raised in Limpopo Province. He graduated with a Bachelor of Medicine and Bachelor of Surgery degree from Medical University of Southern Africa (MEDUNSA) in 2005 and subsequently completed postgraduate training in psychiatry at the University of Cape Town (in 2012), before joining Stellenbosch University as a senior lecturer. Dr Phahladira is a PhD graduate and core member of the Psychosis Research Program of the Department of Psychiatry at Stellenbosch University. His current research interests include the long-term treatment outcomes following the first episode of psychosis and he has co-authored more than 30 peer reviewed articles in international journals. He is a member of the Schizophrenia International Research Society (SIRS) and serves on its Diversity Task Force. He has presented his work at various conferences locally and internationally. Dr Phahladira was recognized as an emerging leader at the National Health Awards in 2018 and has received several grants and awards. He is the lead-clinician at the psychotherapeutic unit at Lentegeur Hospital and mentors many undergraduate and postgraduate students.*

State of the Art Lecture 8

Prof Pierre Goussard
(Department of Paediatrics and Child Health)

Title: *"Pediatric bronchoscopy : The role of an expensive toy in the developing world"*



Prof Pierre Goussard *is the Head of Clinical Units: Paediatric Pulmonology and Paediatric Intensive Care at Tygerberg Hospital and the chair of Tygerberg Hospital Children's Trust. Tygerberg Hospital acts as a referral centre for complicated cases including disease like Tuberculosis, HIV, complicated pneumonia as well as complicated airway pathology and congenital lesions. He is responsible for paediatric bronchoscopes, seeing 350 cases per year which includes flexible bronchoscopes and rigid bronchoscopes. He also does a large number of different interventional procedures. His research fields include airway disease due to tuberculosis as well as new diagnostic methods using BAL in tuberculosis and other disease. He completed his PhD and has published 161 peer reviewed articles and a number of book chapters. He serves on the International Advisory Board of the annual International Congress on Pediatric Pulmonology (CIPP) and is the Co-Chair of the annual Here Be Lungs Conference Organising Committee.*

Full Programme / Volledige Program

Theme 1 / Tema 1

Infectious Diseases / Infeksiesiektes
Lecture Hall 11 / Lesinglokaal 11

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

MAIN PROGRAMME / HOOFPROGRAM (Lecture Hall 11)

12h45-12h55: **OPENING AND WELCOME** - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

12h55-13h15: **DEAN'S ADDRESS** – Prof Elmi Muller (Dean, Faculty of Medicine and Health Sciences, Stellenbosch University)

13h15-13h20: **HANDING OVER OF THE HD BREDE AWARDS FOR TB RESEARCH AND THE FACULTY AWARDS FOR EXCELLENCE IN A MASTER'S PROGRAMME**
- Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

13h20-13h30: **INTRODUCTION OF GUEST SPEAKER** - Prof Elmi Muller

13h30-14h15: **GUEST SPEAKER** (see page 8) – Dr Patrice Matchaba, President, Novartis US Foundation and Novartis US Head for Corporate Responsibility.
Presentation title: "*A new urgency and Perspective about Global and Human Health*"

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 11)

Session Chair / Sessie Voorsitter: Prof Gerhard Walzl

14h45-15h15 **STATE OF THE ART LECTURE 1**
POST-TB LUNG DISEASE: OF OSTRICHES, ELEPHANTS AND ADVOCATES
PROF BRIAN ALLWOOD

15h15-15h30 **LONG ACTING CABOTEGRAVIR: UPDATED EFFICACY AND SAFETY RESULTS FROM HPTN 084**
P BOCK
(Abstract Nr 1)

15h30-15h45 **UTILITY OF HOST TRANSCRIPTOMIC SIGNATURES IN DISCRIMINATING TUBERCULOSIS DISEASE FROM LATENT AND OTHER LOWER RESPIRATORY INFECTIONS IN A LOW ENDEMIC HOSPITAL-BASED SETTING**
B CHENDI
(Abstract Nr 2)

15h45-16h00 **IDENTIFICATION AND CHARACTERISATION OF NONTUBERCULOUS MYCOBACTERIA THAT MAY IMPEDE THE DIAGNOSIS OF BOVINE TUBERCULOSIS IN AFRICAN BUFFALOES (SYNCERUS CAFFER)**
C CLARKE
(Abstract Nr 3)

16h00-16h15 **THE CHARACTERISATION OF VIRULENCE IN COAGULASE-NEGATIVE STAPHYLOCOCCI CAUSING NEONATAL SEPSIS AT TYGERBERG HOSPITAL**
S CLOETE
(Abstract Nr 4)

16h15-16h30 **WHOLE GENOME SEQUENCING FOR COMPREHENSIVE MANAGEMENT OF BEDAQUILINE-RESISTANT TUBERCULOSIS: A CASE REPORT**
E CONCEICAO
(Abstract Nr 5)

16h30-16h45 **INVESTIGATING THE PREVALENCE OF HR-HPV INFECTION AND THE IMPACT OF HIV INFECTION ON CERVICAL CANCER AMONG WOMEN IN CAMEROON**
D G NDEH
(Abstract Nr 6)

16h45-17h00 **DISCREPANCIES BETWEEN ROUTINE PHENOTYPIC AND GENOTYPIC ISONIAZID SUSCEPTIBILITY TESTING OF MYCOBACTERIUM TUBERCULOSIS: COOPERATION FROM THE SCIENCE COMMUNITY TO IMPROVE DIAGNOSTICS**
E STREICHER
(Abstract Nr 7)

17h00-17h15 **EVALUATION OF APPROPRIATENESS OF PATIENT SELECTION AND THE EFFECT ON LEUKOCYTE LABELLING EFFICIENCY WITH [99MTC]TC-HMPAO**
B ADEDEJI
(Abstract Nr 8)

17h15-17h30 **CORRELATING HIGH-RISK HPV AND P16/KI67 CO-EXPRESSION WITH HIV INFECTION IN ABNORMAL CERVICAL SQUAMOUS INTRAEPITHELIAL CELLS**
M LOUW
(Abstract Nr 9)

17h30-17h45 **CORRELATION BETWEEN LUNG FUNCTION TESTS AND PEAK OXYGENCONSUMPTION IN POST-TB LUNG DISEASE**
B CURRY
(Abstract Nr 10)

17h45 **CLOSE OF SESSION 1 OF INFECTIOUS DISEASES TRACK**

Thursday 01 September 2022 / Donderdag 01 September 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

SECOND SESSION / TWEEDE SESSIE (Lecture Hall 11)

Session Chair / Sessie Voorsitter: Prof Andrew Whitelaw

12h45-13h00 **THE ASSOCIATION BETWEEN ACID-BASE STATUS AND CLINICAL OUTCOME IN CRITICALLY ILL COVID-19 PATIENTS ADMITTED TO ICU WITH AN EMPHASIS ON HIGH ANION GAP ACIDOSIS**
O WIESE
(Abstract Nr 11)

13h00-13h15 **PREFERENCES FOR TUBERCULOSIS PREVENTIVE THERAPY AMONG CHILDREN, ADOLESCENTS, AND CAREGIVERS IN SOUTH AFRICA: A DISCRETE CHOICE EXPERIMENT.**
A MCINZIBA
(Abstract Nr 12)

13h15-13h30 **CLINICAL FEATURES AND OUTCOMES OF COVID-19 ADMISSIONS IN A POPULATION WITH A HIGH PREVALENCE OF HIV AND TUBERCULOSIS: A MULTICENTRE COHORT STUDY**
A PARKER
(Abstract Nr 13)

13h30-13h45 **DETERMINATION OF THE TRANSCRIPTOMIC EFFECTS AND COMPENSATORY ROLE OF INHA PROMOTER MUTATION IN MYCOBACTERIUM TUBERCULOSIS**
L MWENDWA
(Abstract Nr 14)

13h45-14h00 **"WHY CAN'T WE DO IT FOR TB?": TUBERCULOSIS PROGRAMME STAKEHOLDERS' PERSPECTIVES ON LESSONS FROM THE COVID-19 RESPONSE IN SOUTH AFRICA**
H MYBURGH
(Abstract Nr 15)

14h00-14h15 **CHARACTERIZATION OF MYCOBACTERIUM BOVIS PERSISTERS FROM SOUTH AFRICA**
P NCUBE
(Abstract Nr 16)

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

THIRD SESSION / DERDE SESSIE (Lecture Hall 11)

Session Chair / Sessie Voorsitter: Prof Wolfgang Preiser

14h45-15h00 **POLYGENIC RISK SCORE FOR PREDICTION OF TUBERCULOSIS SUSCEPTIBILITY IN AN ADMIXED SOUTH AFRICAN POPULATION**
C NDONG SIMA
(Abstract Nr 17)

15h00-15h15	**APPLICATION OF WGS TO PREDICT RESISTANCE IN MYCOBACTERIUM TUBERCULOSIS STRAINS TO DRUGS IN THE NEW XDR-TB REGIMEN** J NGOM (Abstract Nr 18)
15h15-15h30	**CHARACTERISTICS AND OUTCOMES OF INFECTIVE ENDOCARDITIS IN SOUTH AFRICA: A RETROSPECTIVE COHORT STUDY** S POERSTAMPER (Abstract Nr 19)
15h30-15h45	**ALTERED CARDIAC STRUCTURE AND FUNCTION IN NEWLY DIAGNOSED PEOPLE LIVING WITH HIV: A PROSPECTIVE CARDIOVASCULAR MAGNETIC RESONANCE STUDY AFTER THE INITIATION OF ANTIRETROVIRAL TREATMENT** P ROBBERTSE (Abstract Nr 20)
15h45-16h00	**HOST GENETIC FACTORS CONTRIBUTING TO THE SUSCEPTIBILITY TO COVID-19** C STEYL (Abstract Nr 21)
16h00-16h15	**CULTURE-INDEPENDENT PCR DETECTION AND DIFFERENTIATION OF MYCOBACTERIA SPP. FROM ANTEMORTEM PAUCIBACILLARY RESPIRATORY FROM AFRICAN ELEPHANTS AND RHINOCEROS IN SOUTH AFRICA** W GOOSEN (Abstract Nr 22)
16h15-16h30	**HUMORAL RESPONSE TO HUMAN CYTOMEGALOVIRUS AND RISK OF PULMONARY TUBERCULOSIS IN ADOLESCENTS: A CASE-CONTROL STUDY** J SWANEPOEL (Abstract Nr 23)
16h30-16h45	**QUESTIONS AND REFLECTION ON THE DAY**
16h45	**CLOSE OF INFECTIOUS DISEASES TRACK**

Theme 2 / Tema 2

Non-Communicable Diseases/ Nie-Oordraagbare Siektes
Lecture Hall 5 / Lesingsaal 5

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

MAIN PROGRAMME / HOOFPROGRAM (Lecture Hall 11)

12h45-12h55: **OPENING AND WELCOME** - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

12h55-13h15: **DEAN'S ADDRESS** – Prof Elmi Muller (Dean, Faculty of Medicine and Health Sciences, Stellenbosch University)

13h15-13h20: **HANDING OVER OF THE HD BREDE AWARDS FOR TB RESEARCH AND THE FACULTY AWARDS FOR EXCELLENCE IN A MASTER'S PROGRAMME**
- Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

13h20-13h30: **INTRODUCTION OF GUEST SPEAKER** - Prof Elmi Muller

13h30-14h15: **GUEST SPEAKER** (see page 8) – Dr Patrice Matchaba, President, Novartis US Foundation and Novartis US Head for Corporate Responsibility.
Presentation title: "*A new urgency and Perspective about Global and Human Health*"

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 5)

Session Chair / Sessie Voorsitter: Prof Helmuth Reuter

14h45-15h00 **THE INCIDENCE AND OUTCOMES OF HIGH-RISK ACUTE CORONARY SYNDROMES IN THE WESTERN CAPE PROVINCE OF SOUTH AFRICA: A PROSPECTIVE COHORT STUDY**
J CILLIERS
(Abstract Nr 24)

15h00-15h15 **IMATINIB RESISTANCE: THE ROLE OF PHARMACOGENETIC VARIABILITY IN A SOUTH AFRICAN CHRONIC MYELOID LEUKEMIA COHORT**
C DE LONG
(Abstract Nr 25)

15h15-15h30 **IL1-RA AND SOLUBLE VCAM-1 ARE ASSOCIATED WITH LEFT VENTRICULAR DYSFUNCTION IN SYSTEMIC LUPUS ERYTHEMATOSUS**
R DU TOIT
(Abstract Nr 26)

15h30-15h45	**THE MUTATIONAL LANDSCAPE OF PHILADELPHIA CHROMOSOME-NEGATIVE MYELOPROLIFERATIVE NEOPLASMSIN THE WESTERN CAPE PROVINCE, SOUTH AFRICA** M DICKS (Abstract Nr 27)
15h45-16h00	**THE THERAPEUTIC EFFICACY OF ASCORBIC ACID 2 PHOSPHATE, N-ACETYLCYSTEINEAND METFORMIN AGAINST DIABETES MELLITUS ASSOCIATED CELLULAR SENESCENCE** S GOVENDER (Abstract Nr 28)
16h00-16h15	**INCIDENCE AND ONE-YEAR SURVIVAL IN ELDERLY SOUTH AFRICANS STARTING KIDNEY REPLACEMENT THERAPY** T JARDINE (Abstract Nr 29)
16h15-16h30	**EVALUATION OF HAND LABELLING OF LUTETIUM-177-PSMA-I&T ACCORDING TO RADIOPHARMACEUTICAL QUALITY CONTROL PARAMETERS** S SIBIYA-MRWETYANA (Abstract Nr 30)
16h30-16h45	**THE DEVELOPMENT OF AN LC-MS/MS METHOD TO DETECT SPECIES SPECIFIC SNAKE VENOM TOXINS IN HUMAN PLASMA** A LERMER (Abstract Nr 31)
16h45-17h00	**ASSOCIATION BETWEEN PBD ADHERENCE AND CARDIOMETABOLIC RISK PROFILE IN COMMERCIAL TAXI DRIVERS** T LOPES (Abstract Nr 32)
17h00-17h15	**ANALYSIS AND COMPARISON OF ACUTE TOXICITIES IN HYPOFRACTIONATION RADIOTHERAPY VS STANDARD FRACTIONATION RADIOTHERAPY IN HEAD AND NECK CANCERS OVER A PERIOD OF 12 MONTHS AT TYGERBERG HOSPITAL** G JORAM (Abstract Nr 33)
17h15-17h30	**HYPERTENSION DOES NOT INFLUENCE AORTIC STENOSIS SEVERITY ASSESSMENT USING MEAN TRANSVALVULAR GRADIENT** J LIEBENBERG (Abstract Nr 34)
17h30-17h45	**QUESTIONS AND REFLECTION ON THE DAY**
17h45	**CLOSE OF SESSION 1 OF NON-COMMUNICABLE DISEASES TRACK**

Thursday 01 September 2022 / Donderdag 01 September 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

SECOND SESSION / TWEEDE SESSIE (Lecture Hall 5)

Session Chair / Sessie Voorsitter: Dr Erna Marais

12h45-13h15 **STATE OF THE ART LECTURE 4**
GENOMICS IN AFRICA: LESSONS FROM THE UNDIAGNOSED DISEASE PROGRAMME
PROF SHAHIDA MOOSA

13h15-13h30 **THE CLINICAL PROFILE OF HDL2 IN THE WESTERN CAPE POPULATION OF SOUTH AFRICA | NAROTAM JEENA, HEENA, STELLENBOSCH UNIVERSITY, TYGERBERG HOSPITAL**
H NAROTAM JEENA
(Abstract Nr 35)

13h30-13h45 **DEFINING THE ROLE OF C-REACTIVE PROTEIN VALUES IN DIFFERENTIATING A FLARE FROM AN INFECTION IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS**
T SABELA
(Abstract Nr 36)

13h45-14h00 **THE DETECTION OF STRESS-RELATED DISEASES: A UNIQUE METHOD TO DISCOVER CIRCULATORY PHOSPHOPROTEINS | SMITH, MR LOGAN, STELLENBOSCH UNIVERSITY**
L SMITH
(Abstract Nr 37)

14h00-14h15 **DISTINCT SEX-SPECIFIC RESPONSES IN A PRECLINICAL MODEL OF CHRONIC STRESS**
M VAN WYK
(Abstract Nr 38)

14h15 **CLOSE OF NON-COMMUNICABLE DISEASES TRACK**

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

Theme 3 / Tema 3

Global Health, Public Health and Health Systems /
Globale Gesondheid, Openbare Gesondheid en Gesondheidstelsels
Lecture Hall 7 / Lesingsaal 7

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

MAIN PROGRAMME / HOOFPROGRAM (Lecture Hall 11)

12h45-12h55: **OPENING AND WELCOME** - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

12h55-13h15: **DEAN'S ADDRESS** – Prof Elmi Muller (Dean, Faculty of Medicine and Health Sciences, Stellenbosch University)

13h15-13h20: **HANDING OVER OF THE HD BREDE AWARDS FOR TB RESEARCH AND THE FACULTY AWARDS FOR EXCELLENCE IN A MASTER'S PROGRAMME**
- Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

13h20-13h30: **INTRODUCTION OF GUEST SPEAKER** - Prof Elmi Muller

13h30-14h15: **GUEST SPEAKER** (see page 8) – Dr Patrice Matchaba, President, Novartis US Foundation and Novartis US Head for Corporate Responsibility.
Presentation title: "*A new urgency and Perspective about Global and Human Health*"

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 7)

Session Chair / Sessie Voorsitter: Prof Kathryn Chu

14h45-15h00 **INVESTIGATING VACCINE HESITANCY IN THE CITY OF CAPE TOWN METROPOLITAN DISTRICT**
E ODUWOLE
(Abstract Nr 39)

15h00-15h15 **EXPLORING A METROPOLITAN DISTRICT'S RESPONSE DURING THE FIRST COVID-19 WAVE: APPLYING A HEALTH SYSTEMS RESILIENCE FRAMEWORK**
R ENGLISH
(Abstract Nr 40)

15h15-15h30 **SOUTH AFRICAN HEALTHCARE COST DRIVERS**
M PATEL
(Abstract Nr 41)

15h30-15h45 **RESOURCES SUPPORTING TRUSTWORTHY, RAPID AND EQUITABLE EVIDENCE SYNTHESIS AND GUIDELINE DEVELOPMENT: RESULTS FROM**

THE COVID-19 EVIDENCE NETWORK TO SUPPORT DECISION-MAKING (COVID-END)
M MCCAUL
(Abstract Nr 42)

15h45-16h00 **PERCEPTIONS AND EXPERIENCES OF DELAYS TO ACCESSING CARE FOR APPENDECTOMY IN THE WESTERN CAPE, SOUTH AFRICA**
J LOUW
(Abstract Nr 43)

16h00-16h15 **VALIDATING THE SEFI® TOOL (SELF EVALUATION OF FOOD INTAKE) IN HOSPITALIZED PATIENTS OF SOUTH AFRICA**
A STEENKAMP
(Abstract Nr 44)

16h15-16h30 **MEDIA CONTENT ANALYSIS ON THE EXTENT AND NATURE OF COVERAGE GIVEN TO THE COMPETITION COMMISSION COVID- 19 BLOCK EXEMPTION INTO HEALTHCARE**
A ABDULLAH
(Abstract Nr 45)

16h30-16h45 **QUESTIONS AND REFLECTION ON THE DAY**

16h45 **CLOSE OF SESSION 1 OF GLOBAL HEALTH, PUBLIC HEALTH, HEALTH SYSTEMS TRACK**

Thursday 01 September 2022 / Donderdag 01 September 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

SECOND SESSION / TWEEDE SESSIE (Lecture Hall 7)

Session Chair / Sessie Voorsitter: Prof Rene English

12h45-13h00 **FROM CONSUMPTIVE CHIC TO DIRTY DISEASE: SOCIETAL ATTITUDES TO TUBERCULOSIS AS REVEALED IN THE ARTS AND LITERATURE**
S PURCHASE
(Abstract Nr 46)

13h00-13h15 **LESSONS FROM A SYSTEMATIC TRACING PROCESS AIMED AT REDUCING INITIAL LOSS TO FOLLOW-UP (ILTFU) AMONG TUBERCULOSIS (TB) PATIENTS IN CAPE TOWN, SOUTH AFRICA**
N VANQA
(Abstract Nr 47)

13h15-13h30 **THE PREVALENCE AND ASSOCIATED FACTORS RESPONSIBLE FOR DELAYED RETURN TO WORKAFTER THE MANDATORY ISOLATION PERIOD POST-COVID-19 AT TYGERBERG HOSPITAL, 2020A CROSS-SECTIONAL STUDY**
F WEINAND
(Abstract Nr 48)

13h30-13h45	**MENTAL HEALTH SCREENING IN THE CONTEXT OF OCCUPATIONAL HEALTH SURVEILLANCE** C VAN WIJK (Abstract Nr 49)
13h45-14h15	**STATE OF THE ART LECTURE 5** **LINGERING SHOCK WAVES OF COVID-19 PANDEMIC: A GLOBAL HEALTH PERSPECTIVE** PROF PETER NYASULU
14h15	**CLOSE OF GLOBAL HEALTH, PUBLIC HEALTH, HEALTH SYSTEMS TRACK**
14h15-14h45:	**TEA AND POSTER DISCUSSIONS**

Theme 4 / Tema 4

Violence, Injuries, Trauma and Rehabilitation / Geweld, Beserings, Trauma en Rehabilitasie

Lecture Hall 6 / Lesingsaal 6

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

MAIN PROGRAMME / HOOFPROGRAM (Lecture Hall 11)

12h45-12h55: **OPENING AND WELCOME** - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

12h55-13h15: **DEAN'S ADDRESS** – Prof Elmi Muller (Dean, Faculty of Medicine and Health Sciences, Stellenbosch University)

13h15-13h20: **HANDING OVER OF THE HD BREDE AWARDS FOR TB RESEARCH AND THE FACULTY AWARDS FOR EXCELLENCE IN A MASTER'S PROGRAMME**
- Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

13h20-13h30: **INTRODUCTION OF GUEST SPEAKER** - Prof Elmi Muller

13h30-14h15: **GUEST SPEAKER** (see page 8) – Dr Patrice Matchaba, President, Novartis US Foundation and Novartis US Head for Corporate Responsibility.
Presentation title: "*A new urgency and Perspective about Global and Human Health*"

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 6)

Session Chair / Sessie Voorsitter: Prof Susan Hanekom

14h45-15h00 **THE ROLE OF OXYTOCIN RECEPTOR GENE VARIANTS IN APPETITIVE AGGRESSION: A STUDY IN A SOUTH AFRICAN POPULATION**
C LOHRENTZ
(Abstract Nr 50)

15h00-15h15 **EARLY OUTCOMES OF SURGICALLY MANAGED CIVILIAN GUNSHOT FEMUR FRACTURES AT A LEVEL ONE TRAUMA UNIT IN CAPE TOWN, SOUTH AFRICA: A RETROSPECTIVE REVIEW**
O MAKHUBALO
(Abstract Nr 51)

15h15-15h30 **AVAILABLE DYSPHAGIA ASSESSMENT PROTOCOLS FOR POPULATIONS WITH PAEDIATRIC TRAUMATIC BRAIN INJURY: A SCOPING REVIEW**
B MEHALE
(Abstract Nr 52)

15h30-16h00	**STATE OF THE ART LECTURE 2** **TITLE: "VIOLENCE AGAINST PEOPLE WITH DISABILITIES: WHAT IT LOOKS LIKE, WHERE IT HAPPENS, AND HOW TO PREVENT IT"** DR XANTHE HUNT
16h00-16h15	**EFFECTIVENESS OF QUADRICEPS MUSCLE STRENGTHENING ON ACTIVE TERMINAL KNEE EXTENSION DEFICIT FOLLOWING FEMORAL FRACTURE: A CASE STUDY AND LITERATURE REVIEW** T AINSWORTH (Abstract Nr 53)
16h15-16h30	**FACILITATORS AND BARRIERS OF TELEREHABILITATION AT THE BISHOP LAVIS REHABILITATION CENTRE: A STAKEHOLDER PERSPECTIVE** M DE VILLIERS (Abstract Nr 54)
16h30-16h45	**INJURY PATTERN, MANAGEMENT AND OUTCOMES OF GUNSHOT-RELATED FRACTURES TO THE HAND AND WRIST AT A TERTIARY LEVEL TRAUMA CENTER** W HOWARD (Abstract Nr 55)
16h45-17h00	**THE IMMEDIATE EFFECT OF PROGRESSIVE MUSCLE RELAXATION ON THE PAIN AND MENTAL WELL-BEING OF GARMENT WORKERS** Z JACOBS (Abstract Nr 56)
17h00-17h15	**FUNCTIONAL RESPONSE OF A PATIENT WITH HEMIPLEGIA TO TRUNK REHABILITATION: A CASE STUDY AND LITERATURE REVIEW** S KLOPSTRA (Abstract Nr 57)
17h15-17h30	**MANAGEMENT AND OUTCOMES OF GUNSHOT INDUCED FOREARM FRACTURES** D BRUCE-BRAND (Abstract Nr 58)
17h30-17h45	**QUESTIONS AND REFLECTION ON DAY 1**
17h45	**CLOSE OF VIOLENCE, INJURIES, TRAUMA AND REHABILITATION TRACK**

Theme 5 / Tema 5

Perioperative Sciences / Perioperatiewe Wetenskappe
Lecture Hall 8 / Lesingsaal 8

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

MAIN PROGRAMME / HOOFPROGRAM (Lecture Hall 11)

12h45-12h55: **OPENING AND WELCOME** - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

12h55-13h15: **DEAN'S ADDRESS** – Prof Elmi Muller (Dean, Faculty of Medicine and Health Sciences, Stellenbosch University)

13h15-13h20: **HANDING OVER OF THE HD BREDE AWARDS FOR TB RESEARCH AND THE FACULTY AWARDS FOR EXCELLENCE IN A MASTER'S PROGRAMME**
- Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

13h20-13h30: **INTRODUCTION OF GUEST SPEAKER** - Prof Elmi Muller

13h30-14h15: **GUEST SPEAKER** (see page 8) – Dr Patrice Matchaba, President, Novartis US Foundation and Novartis US Head for Corporate Responsibility.
Presentation title: "*A new urgency and Perspective about Global and Human Health*"

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 8)

Session Chair / Sessie Voorsitter: Prof Elmin Steyn

14h45-15h00 **DEAD SPACE MANAGEMENT STRATEGIES IN THE TREATMENT OF CHRONIC OSTEOMYELITIS**
G EPSTEIN
(Abstract Nr 59)

15h00-15h15 **POSTERIOR MALLEOLUS ANKLE FRACTURES: INVESTIGATING THE FRACTURE PATTERNS AND THE MANAGEMENT DECISIONS OF POSTERIOR MALLEOLUS ANKLE FRACTURES IN THE SOUTH AFRICAN POPULATION**
E FUZY
(Abstract Nr 60)

15h15-15h30 **THE SPECTRUM OF DISEASE AND SHORT-TERM OUTCOMES OF OBSTETRIC PATIENTS WITH CARDIAC DISEASE AT A TERTIARY HOSPITAL IN SOUTH AFRICA**
N GREEFF
(Abstract Nr 61)

15h30-15h45	**UTILISATION OF THE POST ANAESTHETIC HIGH CARE UNIT AT TYGERBERG HOSPITAL: A RETROSPECTIVE AUDIT** L HARMSE (Abstract Nr 62)
15h45-16h00	**SURGICAL OUTCOME OF INFECTIVE ENDOCARDITIS AT TYGERBERG HOSPITAL FROM 2010-2019: A RETROSPECTIVE REVIEW** R NEL (Abstract Nr 63)
16h00-16h15	**A QUALITY IMPROVEMENT STUDY OF THE INFORMATION PERTAINING TO ANTICIPATED POST-OPERATIVE COURSE IN MASTECTOMY PATIENTS** L NELL (Abstract Nr 64)
16h15-16h45	**STATE OF THE ART LECTURE 3** **TITLE: "ROBODOC - BRINGING THE ICU TO YOU** DR NADIYA AHMED
16h45-17h00	**EFFECT OF A CARBOHYDRATE LOLLIPOP ON THE GASTRIC VOLUME OF FASTED PEDIATRIC PATIENTS** P ODENDAAL (Abstract Nr 65)
17h00-17h15	**INVESTIGATING A LOW-COST, NASOPHARYNGEAL APNOEIC OXYGENATION TECHNIQUE IN A MORBIDLY OBESE POPULATION: A RANDOMISED CONTROLLED STUDY** S PIERPOINT (Abstract Nr 66)
17h15-17h30	**PETROLEUM JELLY AS AN ALTERNATIVE COUPLINGMEDIUM IN FOCUS ASSESSED TRANSTHORACIC ECHOCARDIOGRAPHY (FATE)** C SMIT (Abstract Nr 67)
17h30-17h45	**THIRTY-DAY UNPLANNED REOPERATION FOLLOWING SPINAL SURGERY: HOW DOES THE SOUTH AFRICAN PRIVATE SECTOR MEASURE UP?** M VAN HEUKELUM (Abstract Nr 68)
17h45	**CLOSE OF PERIOPERATIVE SCIENCES TRACK**

Theme 6 / Tema 6

Maternal and Child Health / Moeder en Kind Gesondheid
Lecture Hall 12 / Lesingsaal 12

Wednesday 31 August 2022 / Woensdag 31 Augustus 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

MAIN PROGRAMME / HOOFPROGRAM (Lecture Hall 11)

12h45-12h55: **OPENING AND WELCOME** - Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

12h55-13h15: **DEAN'S ADDRESS** – Prof Elmi Muller (Dean, Faculty of Medicine and Health Sciences, Stellenbosch University)

13h15-13h20: **HANDING OVER OF THE HD BREDE AWARDS FOR TB RESEARCH AND THE FACULTY AWARDS FOR EXCELLENCE IN A MASTER'S PROGRAMME**
- Prof NC Gey van Pittius (Vice Dean: Research and Internationalisation)

13h20-13h30: **INTRODUCTION OF GUEST SPEAKER** - Prof Elmi Muller

13h30-14h15: **GUEST SPEAKER** (see page 8) – Dr Patrice Matchaba, President, Novartis US Foundation and Novartis US Head for Corporate Responsibility.
Presentation title: "*A new urgency and Perspective about Global and Human Health*"

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 12)

Session Chair / Sessie Voorsitter: Prof Mariana Kruger

14h45-15h00 **THE BURDEN AND OUTCOMES OF SELECTED CONGENITAL SURGICAL ABNORMALITIES AT A TERTIARY CARE SOUTH AFRICAN NEONATAL INTENSIVE CARE UNIT**
I ABRAHAMS
(Abstract Nr 69)

15h00-15h15 **CAREGIVERS' PERSPECTIVES ON HEALTH-RELATED QUALITY OF LIFE DOMAINS FOR CHILDREN WITH TUBERCULOSIS AND OTHER RESPIRATORY ILLNESSES**
M ANTHONY
(Abstract Nr 70)

15h15-15h30 **TUBERCULOSIS PREVENTIVE THERAPY (TPT) IMPLEMENTATION IN THREE SOUTH AFRICAN PROVINCES: FACILITY-LEVEL REVIEW**
D BALOYI
(Abstract Nr 71)

15h30-15h45	**PSYCHOSOCIAL DISTRESS OF YOUNG ADULT AND ADULT CHILDHOOD CANCER SURVIVORS IN A SOUTH AFRICAN COHORT** A VAN ZYL (Abstract Nr 72)
15h45-16h00	**MATERNAL AND NEONATAL OUTCOMES OF COVID-19 IN AHIGH-RISK PREGNANT COHORT WITH AND WITHOUT HIV** L DE WAARD (Abstract Nr 73)
16h00-16h15	**A FEASIBILITY RANDOMIZED CONTROLLED TRIAL EVALUATING INTERACTIVE WEEKLY MOBILE PHONE TEXT MESSAGING PLUS MOTIVATIONAL INTERVIEWING VERSUS STANDARD INFANT FEEDING COUNSELLING IN PROMOTION OF BREASTFEEDING AMONG WOMEN LIVING WITH HIV IN SOUTH AFRICA** M DZIKITI (Abstract Nr 74)
16h15-16h30	**THE IMPACT OF THE COVID-19 PANDEMIC ON THE HEALTHCARE UTILIZATION AND OUTCOME OF CHILDREN < 5 YEARS OF AGE IN METRO EAST, CAPE TOWN** N ELMI (Abstract Nr 75)
16h30-16h45	**OUTCOMES OF LOW BIRTH WEIGHT AND PREMATURE INFANTS REQUIRING ADMISSION TO HOSPITAL, FROM THE NORTHERN AND TYGERBERG HEALTH SUBDISTRICT, RISK STRATIFIED BY MATERNAL MENTAL HEALTH** C ELY (Abstract Nr 76)
16h45-17h00	**THE IMPACT OF COVID-19 ON TB TESTING AND DIAGNOSIS IN CHILDREN AND ADOLESCENTS IN THE WESTERN CAPE PROVINCE, SOUTH AFRICA** K DU PREEZ (Abstract Nr 77)
17h00-18h00	**PROF MP KEET MEMORIAL LECTURE**
18h00	**CLOSE OF SESSION 1 OF MATERNAL AND CHILD HEALTH TRACK**

Thursday 01 September 2022 / Donderdag 01 September 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

SECOND SESSION / TWEEDE SESSIE (Lecture Hall 12)

Session Chair / Sessie Voorsitter: Prof Gugu Kali

12h45-13h00 **PREGNANCY OUTCOMES AMONG SOUTH AFRICAN WOMEN WITH TUBERCULOSIS IN THE CONTEXT OF HIV**
S MEEHAN
(Abstract Nr 78)

13h00-13h15 **OUTCOME OF RETINOBLASTOMA TREATMENT PROTOCOL FOR DEVELOPING COUNTRIES AS PER SIOP-PODC RECOMMENDATION IN SOUTH AFRICA**
M KRUGER
(Abstract Nr 79)

13h15-13h30 **DEVELOPMENT AND INTERNAL VALIDATION OF A NEONATAL HEALTHCARE-ASSOCIATED INFECTION PREDICTION SCORE (NEOHOP SCORE)**
L LLOYD
(Abstract Nr 80)

13h30-13h45 **LC-MS/MS METHOD DEVELOPMENT AND VALIDATION FOR THE DETERMINATION OF SULFASALAZINE AND SULFAPYRIDINE IN PLACENTA: APPLICATION TO A PHARMACOKINETIC STUDY**
V LOUW
(Abstract Nr 81)

13h45-14h00 **A SYSTEMATIC REVIEW OF CEREBRAL PALSY IN AFRICAN PAEDIATRIC POPULATIONS**
S MURUGASEN
(Abstract Nr 82)

14h00-14h15 **CHEST X-RAY FEATURES OF NON-SEVERE PULMONARY TUBERCULOSIS IN CHILDREN ENROLLED ON THE SHINE TRIAL**
M PALMER
(Abstract Nr 83)

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

THIRD SESSION / DERDE SESSIE (Lecture Hall 12)

Session Chair / Sessie Voorsitter: Prof Ronald van Toorn

14h45-15h00 **TRACKING OF LUNG FUNCTION DURING ANTITUBERCULOSIS TREATMENT IN ADOLESCENTS WITH PULMONARY TUBERCULOSIS**
M VAN DER ZALM
(Abstract Nr 84)

15h00-15h15	**CHALLENGES OF CONDUCTING CLINICAL RESEARCH IN LOW-MIDDLE INCOME COUNTRIES: REFLECTIONS ON RESEARCH FIELD EXPERIENCES FROM CAPE TOWN, SOUTH AFRICA** M VAN NIEKERK (Abstract Nr 85)
15h15-15h30	**ENDOSCOPIC FINDINGS IN CHILDREN BORN WITH OESOPHAGEAL ATRESIA** D DE VOS (Abstract Nr 86)
15h30-15h45	**THE HEALTH SYSTEMS IMPACT OF COVID-19 ON CHILDREN WITH TUBERCULOUS MENINGITIS THROUGH THE LENS OF HEALTH CARE WORKERS** D BALOYI (Abstract Nr 87)
15h45-16h00	**SHORT TERM OUTCOMES OF SOUTH AFRICAN CHILDREN WITH MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN (MIS-C): A PROSPECTIVE COHORT STUDY** J LISHMAN (Abstract Nr 88)
16h00-16h15	**UTERINE BALLOON VOLUME SHIFTS USING A FREE-FLOW UTERINE BALLOON IN THE MANAGEMENT OF REFRACTORY POST-PARTUM HAEMORRHAGE** T HASSIM (Abstract Nr 89)
16h15-16h45	**STATE OF THE ART LECTURE 8** **TITLE: "PEDIATRIC BRONCHOSCOPY : THE ROLE OF AN EXPENSIVE TOY IN THE DEVELOPING WORLD** PROF PIERRE GOUSSARD
16h45-17h00	**QUESTIONS AND REFLECTION ON THE DAY**
17h00	**CLOSE OF MATERNAL AND CHILD HEALTH TRACK**

Theme 7 / Tema 7

Health Professions Education / Gesondheidsberoepe Onderwys

Lecture Hall 6 / Lesingsaal 6

Thursday 01 September 2022 / Donderdag 01 September 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 6)

Session Chair / Sessie Voorsitter: Dr Mariette Volschenk

12h45-13h00 **EXPERIENCES USING VIDEOS TO COMPLEMENT STRUCTURED ORAL EXAMINATIONS IN SURGERY**
J EDGE
(Abstract Nr 90)

13h00-13h15 **EXPLORING THE PERCEPTIONS OF PHYSIOTHERAPY STUDENTS ON THEIR PREPAREDNESS TO INCLUDE EXERCISE IN THE TREATMENT OF CANCER PATIENTS**
L WILLIAMS
(Abstract Nr 91)

13h15-13h30 **TOWARDS UNDERSTANDING THE USE OF DIGITAL ANATOMY LEARNING PLATFORMS - PRELIMINARY FINDINGS**
J FOIRET
(Abstract Nr 92)

13h30-13h45 **FACILITATORS PERCEPTIONS OF LEARNING IN THE CLINICAL ENVIRONMENT**
A SCHMUTZ
(Abstract Nr 93)

13h45-14h00 **EXPOSURE TO PAEDIATRIC END-OF-LIFE CARE: THE EXPERIENCES AND COPING STRATEGIES OF PAEDIATRIC REGISTRARS IN SOUTH AFRICA**
A SULLIVAN
(Abstract Nr 94)

14h00-14h15 **EXPLORING THE USE OF STANDARDISED TESTS AND NON-STANDARDISED TESTING METHODS USED BY OCCUPATIONAL THERAPISTS WORKING WITH CHILDREN IN A SOUTH AFRICAN CONTEXT**
I KUCHAR
(Abstract Nr 95)

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

SECOND SESSION / TWEEDE SESSIE (Lecture Hall 6)

Session Chair / Sessie Voorsitter: Prof Susan van Schalkwyk

14h45-15h15	**STATE OF THE ART LECTURE 6** **TITLE: "HEALTH PROFESSIONS EDUCATION – WHENCE AND WHITHER** PROF CECILIA JACOBS
15h15-15h30	**A QUALITATIVE STUDY: WOMEN'S LIVED EXPERIENCE OF TRAINING AND WORKING IN ORTHOPAEDIC SURGERY IN SOUTH AFRICA** M THIART (Abstract Nr 96)
15h30-15h45	**'IT'S ALL ABOUT THE PATIENTS': MEDICAL STUDENTS' REFLECTIONS ON A NOVEL 12-WEEK INTEGRATED ROTATION** S VAN SCHALKWYK (Abstract Nr 97)
15h45-16h00	**MEDICAL TEACHERS NAVIGATING THEIR IDENTITY IN THE CONTEXT OF MAJOR CURRICULUM REFORM** M VOLSCHENK (Abstract Nr 98)
16h00-16h15	**STUDENT-PERCEIVED VALUE ON THE USE OF CLAY MODELLING IN UNDERGRADUATE CLINICAL ANATOMY AT STELLENBOSCH UNIVERSITY** J CORREIA (Abstract Nr 99)
16h15-16h45	**SEX AS A SPECTRUM: INCLUSIVE ANATOMICAL EDUCATION AND THE TRANSLATION THEREOF INTO CLINICAL PRACTICE** R LOCHNER (Abstract Nr 100)
16h45-17h00	**QUESTIONS AND REFLECTION ON THE DAY**
17h00	**CLOSE OF HEALTH PROFESSIONS EDUCATION TRACK**

Theme 8 / Tema 8

Mental Health and Neurosciences / Geestesgesondheid en Neurowetenskappe

Lecture Hall 8 / Lesingsaal 8

Thursday 01 September 2022 / Donderdag 01 September 2022

12h00-12h45 **LUNCH** (Foyer between Lecture Hall 11 and 12) and **POSTER VIEWING**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 8)

Session Chair / Sessie Voorsitter: Dr Michelle Bowers

12h45-13h00 **EFFECT OF BRIEF COPING SKILL TRAINING ON ALCOHOL USE IN HIGH-RISK STUDENT DRINKERS**
F AHMED
(Abstract Nr 101)

13h00-13h15 **ALLOSTATIC EFFECTS OF PTSD AND/OR OBESITY AFFECT DERMAL FIBROBLAST CHARACTERISTICS**
R MEERHOLZ BENECKE
(Abstract Nr 102)

13h15-13h30 **NEUROLOGICAL RISK OF PROLONGED LOW DOSE EXPOSURE TO IMIDACLOPRID ELUCIDATED IN ZEBRAFISH**
M MCCULLOCH
(Abstract Nr 103)

13h30-13h45 **THE FEASIBILITY, ACCEPTABILITY AND PRELIMINARY EFFICACY OF A MENTAL HEALTH SELF-MANAGEMENT APP IN CLINICIANS WORKING DURING THE COVID-19 PANDEMIC: A PILOT RANDOMISED CONTROLLED TRIAL**
K KIRYKOWICZ
(Abstract Nr 104)

13h45-14h00 **GUT MICROBIAL ALTERATIONS IN FOETAL ALCOHOL SPECTRUM DISORDERS**
N KITCHIN
(Abstract Nr 105)

14h00-14h15 **YOUTH ENGAGEMENT IN MENTAL HEALTH RESEARCH: EMERGENT LESSONS FROM A MULTI-COUNTRY COLLABORATION**
C LAURENZI
(Abstract Nr 106)

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

SECOND SESSION / TWEEDE SESSIE (Lecture Hall 8)

Session Chair / Sessie Voorsitter: Prof Soraya Seedat

14h45-15h00	**SPECIES-LEVEL PROFILING OF THE MATERNAL VAGINAL BACTERIOME USING 16S RRNA AMPLICON SEQUENCING WITH APPLICATION TO FETAL ALCOHOL SPECTRUM DISORDERS** L MARTIN (Abstract Nr 107)
15h00-15h15	**INCREASED BLOOD-DERIVED MITOCHONDRIAL DNA COPY NUMBER IN AFRICAN ANCESTRY INDIVIDUALS WITH PARKINSON'S DISEASE** A MÜLLER-NEDEBOCK (Abstract Nr 108)
15h15-15h30	**DISTRESS SECONDARY TO ROMANTIC RELATIONSHIP DISSOLUTION: ASSOCIATED FACTORS AND ATTACHMENT STYLE AS MODERATOR** A VAN DER WATT (Abstract Nr 109)
15h30-16h00	**STATE OF THE ART LECTURE 7** **TITLE: "IMPROVING LONG-TERM TREATMENT OUTCOMES FOR SCHIZOPHRENIA: THE SOUTH AFRICAN EXPERIENCE"** DR LEBOGANG PHAHLADIRA
16h00-16h15	**QUESTIONS AND REFLECTION ON THE DAY**
16h15	**CLOSE OF MENTAL HEALTH AND NEUROSCIENCES TRACK**

Theme 9 / Tema 9

Primary Healthcare / Primêre Gesondheidsorg

Lecture Hall 7 / Lesingsaal 7

Thursday 01 September 2022 / Donderdag 01 September 2022

14h15-14h45: **TEA AND POSTER DISCUSSIONS**

FIRST SESSION / EERSTE SESSIE (Lecture Hall 7)

Session Chair / Sessie Voorsitter: Prof Bob Mash

14h45-15h00 **ADAPTATION AND VALIDATION OF THE UGANDAN PRIMARY CARE ASSESSMENT TOOL (UG-PCAT)**
I BESIGYE
(Abstract Nr 110)

15h00-15h15 **COMMUNICATION SKILLS OF GENERAL PRACTITIONERS IN NAIROBI, KENYA: A DESCRIPTIVE OBSERVATIONAL STUDY**
G MOHAMOUD
(Abstract Nr 111)

15h15-15h30 **EVALUATING THE IMPLEMENTATION OF THE GREAT4DIABETES WHATSAPP CHATBOT TO EDUCATE PEOPLE WITH TYPE 2 DIABETES IN CAPE TOWN DURING THE COVID-19 PANDEMIC: CONVERGENT MIXED METHODS**
D SCHOUW
(Abstract Nr 112)

15h30-16h00 **HEALTHCARE WORKER PERSPECTIVES ON LESSONS FROM THE COVID-19 PANDEMIC FOR NATIONAL TUBERCULOSIS PROGRAMS – A QUANTITATIVE SURVEY FROM THE IMPAC19TB PROJECT IN BRAZIL, RUSSIA, INDIA, AND SOUTH AFRICA**
D WADEMAN
(Abstract Nr 113)

16h00-16h15 **QUESTIONS AND REFLECTION ON THE DAY**

16h15 **CLOSE OF PRIMARY HEALTHCARE TRACK**

Oral Abstracts / Mondelinge Abstrakte

Please note: Abstracts are published as received from the author(s)

Let wel: Abstrakte is gepubliseer soos ontvang van die outeur(s)

Theme 1 - Infectious Diseases / Tema 1 - Infeksiesiektes

Abstract 1

Long acting cabotegravir: updated efficacy and safety results from HPTN 084

Prof Sinead Delany-Moretlwe[1], Prof Jim Hughes[2], A/Prof Peter Bock[3], HPTN 084 study team[1]
[1]Wits RHI, University of the Witwatersrand, Johannesburg, South Africa, , South Africa, [2]Statistical Centre for HIV/AIDS Research Prevention Fred Hutchinson Cancer Research Institute, Seattle, , , USA, [3]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University , , South Africa

Biography:
Peter Bock is Principal Investigator and Family Physicians based at the Desmond Tutu TB Centre working in HV and TB treatment and prevention trials

BACKGROUND
HPTN 084 is an ongoing Phase 3 randomized, controlled trial that demonstrated the superiority of long-acting injectable cabotegravir (CAB) compared to daily oral TDF/FTC for HIV prevention in individuals assigned female at birth (AFAB). The blinded portion of the trial was stopped at a planned interim review in November 2020. Participants were subsequently unblinded and continued on their original randomised study treatment pending a protocol amendment to offer open-label CAB.

METHODS
We report on HIV incidence for the 1) 12-month follow-up period following trial unblinding, 2) cumulative HIV incidence. ≥ Grade 2 adverse events, injection site reactions (ISR), pregnancy incidence and outcomes .

RESULTS
Twenty-three incident infections were observed over 2728 person-years in the 12-month unblinded period (HIV incidence 0.84%, 95% confidence interval [CI] 0.53, 1.26); 3 in the CAB arm (incidence 0.22%, 95% CI 0.04, 0.63) and 23 in the TDF/FTC arm (incidence 1.48%, 95% CI 0.9, 2.2) (hazard ratio [HR] 0.15 (95% CI 0.04, 0.49). Overall, 60 incident HIV infections (6 CAB, 56 TDF/FTC) have been observed during the study over 6626 years of follow up (HIV incidence 0.94%, 95% CI 0.72, 1.2) and the superiority of CAB appears sustained (HR 0.11, 95%CI 0.05, 0.24). Adverse events were mild (36% CAB, 38% TDF/FTC) to moderate (61% CAB, 59% TDF/FTC) and balanced by arm; 22% were assessed as related to study product. In the CAB arm, 6% of participants reported an injection site reaction. An additional 83 confirmed pregnancies (43 CAB, 40 TDF/FTC) occurred in the unblinded period (incidence 3.2%,95% CI 2.56, 3.98). No congenital anomalies were reported.

CONCLUSIONS
Reductions in HIV incidence were sustained. CAB continues to be superior to TDF/FTC in preventing HIV infection in individuals AFAB. Pregnancy incidence was higher in the unblinded period highlighting the importance of ongoing evaluations of CAB safety in pregnancy.

Abstract 2

Utility of host transcriptomic signatures in discriminating Tuberculosis disease from latent and other lower respiratory infections in a low endemic hospital-based setting.

Ms Bih H Chendi[1], Miss Vanessa Muwanga[3], Dr. Tracey Jooste[2], Prof Martin Kidd[4], Dr. Simon Mendelsohn[3], Prof Gerhard Walzl[2], Prof Thomas Scriba[3], Prof Anne M Dyrhol-Riise[5], Prof Chegou Novel[2]

[1]Institute of Clinical Medicine, Faculty of Medicine, University of Oslo, Oslo, Norway, , , [2]DSI-NRF Centre of Excellence for Biomedical Tuberculosis Research; South African Medical Research Council Centre for Tuberculosis Research; Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa., , , [3]South African Tuberculosis Vaccine Initiative, Institute of Infectious Disease and Molecular Medicine and Division of Immunology, Department of Pathology, University of Cape Town, Cape Town, South Africa., , , [4]Department of Statistics and Actuarial Sciences, Centre for Statistical Consultation, Stellenbosch University, Cape Town, South Africa , , , [5]Department of Infectious Diseases, Oslo University Hospital, Oslo, Norway, ,

Biography:

Bih Chendi is a final-year registered Ph.D. fellow at the University of Oslo, Norway, affiliated with Stellenbosch University, where she carries out her research project. Bih earned a master's degree in Health Sciences option: Medical Immunology from the Catholic University of Central Africa, School of Health Sciences, Yaoundé, Cameroon. She is currently supervised by Prof Anne Ma Dryhol-Riise (Norway) and Prof Chegou Novel (SA). Her Ph.D. research project focuses on evaluating the performance of identified host biosignatures for Tuberculosis in low and high TB burden countries. Findings so far have resulted in peer-reviewed articles in accredited journals.

Background and objectives: Host blood transcriptomic signatures have shown promise as candidate biomarkers for non-sputum-based diagnostics in tuberculosis (TB). There is a need for further evaluation of the most promising genes and signatures across different geographical and endemic settings. We assessed the performance of selected published genes and gene signatures in discriminating TB disease from latent TB infection (LTBI) and other lower respiratory tract infections (LRI) in a low TB endemic hospital setting.

Methods: We extracted mRNA from Paxgene blood collected from 86 hospitalised individuals (n=18 TB, n=19 LRI, and n=49 LTBI) recruited at Oslo University Hospital, Norway. We evaluated the expression of 96 genes selected from 20 published gene signatures using a microfluidic qRT-PCR instrument, followed by assessing their abilities to discriminate between the patient groups.

Results: Multiple genes discriminated between the TB patients and individuals with LRI, and LTBI, with Areas Under the ROC curve (AUCs) ≥ 0.80, with GBP1 and GBP5 being amongst the most prominent individual genes. "Satproedprai7", "Sambarey10", "Duffy9", "RISK6", "Gjeon7" and "Laux Da Costa3" were the most accurate published signatures that discriminated between the study groups with AUCs ≥ 0.80. However, a "new/unified" 3-gene signature that was identified, irrespective of the contributing parent signature (UCP2+WARSj1+TMCC1), was the most accurate in distinguishing TB disease from LRI (AUC of 1.00). A new 5-gene signature (GBP5+STT3A+FCGR1C+KAZN+FCGR1A_SAT7) was the most accurate in discriminating TB disease from LTBI (AUC=0.99).

Conclusion: Host blood transcriptomic signatures that were largely identified in studies carried out in high TB burden settings also discriminated TB disease from LRI and LTBI, respectively, in a low-burden hospital setting with high accuracy. The newly identified gene signatures met the WHO target product profile criteria for non-sputum-based triage and confirmatory TB tests, respectively, and warrant further investigation in larger, prospective, diverse patient cohorts.

Abstract 3

Identification and characterisation of nontuberculous mycobacteria that may impede the diagnosis of bovine tuberculosis in African buffaloes (*Syncerus caffer*)

Miss Charlene Clarke[1], Dr Tanya Kerr[1], Dr Leanie Kleynhans[1], Prof Michele Miller[1], Dr Wynand Goosen[1]
[1]*Stellenbosch University, Bellville, South Africa*

Biography:
I am a final-year PhD student in the Animal TB Research Group, Division of Molecular Biology and Human Genetics, at Stellenbosch University. My research focuses on bovine tuberculosis in African buffaloes (Syncerus caffer), specifically investigating rapid molecular techniques that detects mycobacterial DNA in paucibacillary samples. Also, we are investigating infection of buffaloes with nontuberculous mycobacteria, and how this may affect bovine TB diagnosis.

Nontuberculous mycobacteria (NTMs) consist of more than 140 species, of which some are emerging as opportunistic pathogens in livestock and wildlife. Cross-reactivity to M. bovis antigens, ESAT-6 and CFP-10, by some NTMs may impede bovine tuberculosis (bTB) diagnosis, due to false positive test results. Accurate bTB diagnosis is essential, especially in bTB maintenance hosts, African buffaloes, since positive tests may result in culling, or quarantine of the farm. Identification and characterisation of NTMs found in buffaloes are important for improvement of diagnostic accuracy. This study aimed to investigate NTM species diversity in respiratory secretions and tissue samples from buffaloes, using a combination of available molecular tools.
Oronasal swabs were collected from buffaloes (n=120) from historically bTB free herds. Bronchoalveolar lavage fluid (BALF; n=10) or tissue samples (n=19) were collected from other buffaloes, following culling and post-mortem examination. All samples were cultured and PCRs targeting hsp65 and rpoB, and Sanger sequencing, were performed for mycobacterial species identification. Also, NTMs were screened for esat-6 and cfp-10 genes by PCR and Sanger sequencing. Additionally, Xpert MTB/RIF Ultra qPCR and the line probe assay, GenoType CMdirect, were performed directly on oronasal swabs.
36 Positive swab cultures were NTM positive on hsp65 or rpoB PCR sequencing, in which 57 mycobacterial species were identified. The predominant species were M. avium complex, M. komanii and M. novocastrense. Twenty of 36 cultures were esat-6 or cfp-10 positive. Six of 10 positive lavage and 4 of 19 tissue cultures were NTM positive, with 4/6 and 1/4, respectively, esat-6 or cfp-10 positive. Ultra-results revealed that MTBC DNA was not detected in 106/120 swabs. The CMdirect assay detected mycobacterial species in 104/120 swabs, with 75 identified as NTMs of clinical importance.
Our findings show that a great diversity of NTMs may be infecting buffaloes, with several species potentially impeding bTB assays.

Abstract 4

The characterisation of virulence in Coagulase-Negative Staphylococci causing neonatal sepsis at Tygerberg Hospital

Miss Stephanie Cloete[1], Ms Siphiwe Matukane[1,2], Dr Mae Newton-Foot[1,2], Professor Andrew Whitelaw[1,2]
[1]Stellenbosch University, Cape Town , South Africa, [2]National Health Laboratory Services, Cape Town, South Africa

Biography:
I am a second-year MSc Medical Microbiology candidate at Stellenbosch University. I have previously completed my BSc in Molecular biology and Biotechnology and BSc (Hons) Medical Microbiology at Stellenbosch University.

Introduction: Coagulase-Negative Staphylococci(CoNS), although commensals, are important nosocomial pathogens, particularly in premature neonates.
The extensive range of virulence factors in CoNS, some of which may be regulated by mobile genetic elements, contributes to their pathogenicity. This study aims to describe the species distribution, antimicrobial resistance, and molecular virulence markers in CoNS from neonatal blood cultures to identify potential pathogenicity markers.
Methods: Between February and July 2021, 127 CoNS isolates were collected from neonatal blood cultures submitted to Tygerberg NHLS Microbiology laboratory. Species identification was performed on all isolates using mass spectrometry, and antimicrobial susceptibility testing (AST) using the Kirby Bauer disc diffusion method was performed on 82 isolates representing the two predominant species from the most represented hospitals. Twenty isolates, representing a range of susceptibility patterns, were chosen for Oxford Nanopore whole genome sequencing (WGS). The assembled genomes were analysed using the Center for Genomic Epidemiology, VirulenceFinder, ISSaga and Resistance Gene Identifier.
Results: The most common species identified were Staphylococcus epidermidis (80/127, 63%) and Staphylococcus hominis (29/127, 23%). AST showed that 81.7 % (67/82) were non-susceptible to at least one antibiotic, and 54% (44/82) were multidrug resistant. The highest rates of resistance were to erythromycin (64.6%), trimethoprim sulfamethoxazole (56.1%) and cloxacillin (54.9%). The WGS data predicted all 20 isolates as possible human pathogens, with a probability pathogen score higher for S. epidermidis (□=0.93) than S. hominis (□=0.89) isolates ($p<0.001$). The ica operon (biofilm formation) was present in 10/14 S. epidermidis isolates, and 7/14 isolates contained the IS256 mobile element. None of the S. hominis isolates harboured the ica operon.
Conclusion: The presence of the ica operon and IS256, along with varying resistance profiles may enhance the pathogenicity of S. epidermidis . Additional qPCR analysis is planned to explore the role of IS256 in regulating expression of the ica operon.

Abstract 5

Whole genome sequencing for comprehensive management of Bedaquiline-resistant tuberculosis: a case report

Dr Emilyn Conceicao[1], Dr Mingi Miala[2], Dr Boitumelo Fanampe[2], Ms Felicia Wells[1], Dr Tim Heupink[3], Mr Lennert Verboven[3], Ms Leole Setlhare[2], Mr Emmanuel Ogunbayo[4], Ms Nomadlozi Mhalmbo[4], Ms Zandile Sibeko[5], Mr Felex Ndebele[5], Dr Salome Charalambous[5], Ms Anneke Van Dijk[4], Prof Robin Warren[1], Prof Annelies Van Rie[3]

[1]South African Medical Research Council Centre for Tuberculosis Research, DST NRF Centre of Excellence for Biomedical Tuberculosis research, Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Free State Department of Health, TB, DR-TB & CDC Directorate, Bloemfontein, South Africa, [3]Tuberculosis Omics ResearCH, Family Medicine and Population Health, Faculty of Medicine and Health Sciences, University of Antwerp, Antwerp, Belgium, [4]Universitas Academic Laboratory, National Health Laboratory Service and Department of Medical Microbiology, Faculty of Health Sciences, University of the Free State, Bloemfontein, South Africa, [5]Aurum Institute, Johannesburg, South Africa

Biography:

Emilyn joined the Division of MBHG as a postdoctoral fellow in 2021. Her current research focuses on personalized medicine through WGS as part of "Sequencing Mycobacteria and Algorithm-Determined Resistant Tuberculosis Treatment (Smartt) Trial". Emilyn is a Biologist (Federal University of Para), holding a masters degree in Infectious Disease (State University of Para) and PhD in Microbiology (Federal University of Rio de Janeiro/ Paris-Sud University). Emilyn has experience in clinical trials and routine diagnostics with a focus on molecular biology applied to Mycobacterium tuberculosis complex, nontuberculous mycobacteria and Mycobacterium leprae. She is interested in epidemiology, genomics, drug-resistance, bioinformatics and Science education.

An HIV-positive woman with rifampicin resistant tuberculosis initiated the all oral BDQ-LZD-CFZ-LFX-ETO-PZA-INH (high-dose) regimen. Because of fluoroquinolone resistance on LPA, treatment was changed at month 1 to BDQ-LZD-CFZ-DLM-PAS. Culture conversion was achieved at month 4 but reverted at month 11, whereafter the patient was lost to care. One year later she returned and was initiated on BDQ-CFZ-TZD-LZD-DLM-PAS. Phenotypic BDQ resistance was diagnosed on the month 4 culture. The patient was lost to care at month 5 and represented for care 7 months later. We performed whole genome sequencing and contact tracing. The isolate contained 41 mutations in tier-1 and 20 in tier-2 candidate resistance genes. Resistance was detected for INH (inhA_G-154A), RIF/RBT (rpoB_Ser450Leu), PZA (pncA_Gly97Asp), EMB (embB_Met306Val), LFX/MFX (gyrB_Glu501Asp), BDQ/CFZ (mmpR5, Rv0678_Gln22Pro), ETO (inhA_G-154A) and SM (rrs_C517T). Despite the presence of variants, the isolate was judged susceptible to AMI (fprA-11_-10insA, rrs_C-187T, fprA_C591A, aftB_T-770C, tlyA_A33G), TZD (ald_T-32C, cycA_Arg93Leu, cycA_Ser187Pro, cycA_C-14T, ddlA_Thr365Ala), DLM (fgd1_T960C), and imipenem/meropenem (nadD_A-44C). No variants were detected in candidate resistance genes for LZD and PAS. The patient was hospitalized and initiated on LZD-DLM-PAS-TZD-imipenem and clavulanic acid, received a disability grant and support by a psychologist and social worker. The phylogenetic tree did not identify rifampicin resistant isolates with <12 SNP difference from patients residing in the same province. Contact tracing of five household members and two other close contacts revealed that none had active TB. WGS was valuable in the identification of a rescue treatment regimen and was complementary to contact tracing for assessment of transmission.

Abstract 6

Investigating the prevalence of HR-HPV infection and the impact of HIV infection on cervical cancer among women in Cameroon

Mr. Doh Gilbert Ndeh[1], Dr. Micheline Sanderson, Dr. George Mondinde Ikomey, Dr. Atangana Paul, Pr. Tebeu Pierre Marie, Pr. Fokunang Charles
[1]*Stellenbosch University, ,*

Biography:
After obtaining my previous degree from the Faculty of Medicine and Biomedical Sciences, University of Yaoundé 1 in 2012, I worked as a temporary research assistant in a higher education institute and later as a biomedical scientist for the ministry of public Health Cameroon. My research interest is on the determination of disease burden, molecular epidemiology, diagnosis, and genomics of HPV and HIV. My particular interests is in the field of HPV/HIV molecular biology, including monitoring of patients and disease surveillance. From January 2019 till date, I am registered as a Ph.D. student at the division of Anatomical pathology.

Introduction: Cervical cancer (CC) screening, early detection and treatment of cervical pre-cancerous lesions is elemental in preventing up to 80% of pre-cancer lesions from progressing to cancerous lesions. In most developed countries where CC screening is done routinely, ancillary HPV testing has been proven to be more effective than cytology alone for CC screening.
The aim was to determine prevalent high-risk (HR)-HPV types in HIV negative and HIV positive women with low-grade squamous intraepithelial lesions (LSIL) and high-grade squamous intraepithelial lesions (HSIL). Studies have shown a global geographical variation, ranging from 2% to 44%, in the type-specific prevalence of HR-HPV among different populations. This observation implies that the commercially available HPV vaccines could be less effective in countries such as Cameroon.
Material and methods: We used residual exfoliated cervical samples collected from patients in a liquid preservative medium for HR-HPV analysis. The AmpFire® HPV genotyping assay was used for HPV analysis. The Pearson $\chi 2$ test was used for correlation analysis of enumerated data and P-values < 0.05 were considered significant
Results and conclusion: HR-HPV prevalence of 36.9% (133/360) was observed for this study, with 44.6% of HIV positive participants having one or more HR-HPV genotypes. Prevalent HR-HPV genotypes identified in descending order were HPV 56 (14.1%), HPV 58 (8.7%), HPV 52 (7.6%), HPV 16 (7.2%), HPV 18 (6.7%), HPV 45 (5.0%) and HPV 35 (3.1%). There was a higher risk of developing HSIL and eventually CC in patients infected with single or multiple carcinogenic HR-HPVs. HR-HPV and abnormal cervical lesions were most common among women between the ages of 30-45 and among women living with HIV.
As further developments of HPV prophylactic vaccines continue, it is necessary to regard regional variation in HR-HPV type prevalence to ensure optimal protection by the vaccine in a country like Cameroon.

Abstract 7

Discrepancies between routine phenotypic and genotypic isoniazid susceptibility testing of Mycobacterium tuberculosis: Cooperation from the science community to improve diagnostics

Dr Elizabeth Streicher[1], Ms Simone Nagel, Dr Marisa Klopper, Dr Anzaan Dippenaar, Ms Cindy Hayes, Dr James Posey, Prof Robin Warren
[1]*Stellenbosch University, ,*

Biography:
Dr Streicher is a Scientist at MBGH. She has established and manages a culture bank of drug resistant M. tuberculosis isolates from patients from the Western Cape Province, which currently has more than 55000 TB cultures. This very valuable resource forms the basis for various student research and collaborations that contributed significantly to our current understanding and molecular epidemiology, exogenous reinfection, dual infections, and mechanisms and spread of drug resistant TB. A special area of interest is acquisition of drug resistance and specifically the influence of hetero-resistance on the molecular based drug resistance diagnostics.

Isoniazid (INH) serves as the backbone of combined anti-tuberculosis therapy. However, in South Africa, the current algorithm dictates that only rifampicin resistant cases are tested for INH resistance. This is done by the MTBDRplus line-probe assay (LPA), which reports INH resistance based on mutations in katG gene and inhA promoter, followed by a phenotypic drug susceptibility test (DST) to confirm INH susceptibility. However, discrepancies between the results of these tests are frequently reported. This may result in incorrect diagnoses and the prescription of improper drug treatment regimens. This study investigates 297 clinical isolates obtained from a routine laboratory in Eastern Cape Province with discrepant LPA and DST results.
The isolates were investigated by minimum inhibitory concentration determination to confirm resistance and Sanger sequencing and whole genome sequencing (WGS) to determine reasons for the discrepancies between the LPA and DST.
WGS revealed several genomic features that may explain INH resistance in the absence of canonical mutations, including large deletions of katG, heteroresistance and several potential novel resistance-causing mutations, however for about 35% the mechanism of resistance remained unknown.
While LPA is conveniently rapid, and accurate in most cases, phenotypic DST is necessary to detect resistance conferred by less common mechanisms. WGS can be applied to inform researchers and clinicians of such alternative resistance markers and contribute to improve current diagnostics for detection of INH resistance, but it is of utmost importance to have well curated and updated catalogs of these mutations (such as the WHO catalog for drug resistance mutations).

Abstract 8

Evaluation of appropriateness of patient selection and the effect on leukocyte labelling efficiency with [99mTc]Tc-HMPAO

Ms Bolutife Adedeji[1], Dr Janke Kleynhans[1]
[1]*Division of Nuclear Medicine Stellenbosch Universitz, Cape Town, South Africa*

Biography:
Ms Bolutife finished her B.Pharm degree at the University of Ibadan Nigeria in 2017. She then progressed to become an intern at the National Agency for Food and Drugs administration and Control (NAFDAC) and thereafter a supply chain officer. In 2019 she become inolved in Radiopharmacy as a trainee at the Universitz College Hospital, Ibadan Nigeria. She received a scholarship to study her MSc in Nuclear Medicine at the Stellenbosch University, through the IAEA. She joined the group in 2021 and will graduate earlz 2023.

The aim of this study was to retrospectively review data from white blood cell scintigraphy studies performed at Tygerberg Hospital in the last 5 years. It was evaluated if the ESR, CRP and WBC levels were strong enough indicators to request for the study and if the studies requested conformed with the recommendations given by the EANM guidelines. It is important to clarify if the Radiopharmacist should insist on these charactersitics before radiopharmaceutical production begins. Data was retrospectively analyed from patient files at Tygerberg Hospital. A total of 52 case studies with an average age of 58 ± 14 years were reviewed.

The gender distribution was equal. Leucocyte levels, Erythrocyte Sedimentation Rate (ESR), and C-reactive protein levels (CRP) were correlated to the EANM guidelines of threshold levels, initially with positive results and then with labelling efficiency and radiolabeling yield as produced in the radiopharmacy. Only 19% of the investigations done resulted in a positive test for inflammation. All the positive results (10/52) showed a higher CRP range than normal (10 mg/l).

No significance was related to a high ESR rate (31/52) with respect to positive findings. In radiopharmaceutical practice, no correlation was found between labelling efficiency and labelling yield when the EANM criteria for threshold levels to request the study were examined.

Abstract 9

Correlating high-risk HPV and p16/ki67 co-expression with HIV infection in abnormal cervical squamous intraepithelial cells

Ms Meagan Louw[1]
[1]*Stellenbosch University, Francie Van Zijl Drive, South Africa*

Biography:
My name is Meagan Louw I am 31 years old. I am a 2nd year Master's student at the Department of Anatomical Pathology.

Human Papilloma Virus (HPV) is the main etiological factor in the development of cervical cancer. HPV-associated cervical cancer is more likely to develop in people living with Human Immunodeficiency Virus (HIV)(PLWH), possibly due to their compromised immune systems. The aim of this study was to identify the prevalent high risk (hr)-HPV types and to investigate the simultaneous expression of p16INK4a and ki67 in cytology samples from HIV-positive and HIV-negative women with pre-cancerous cervical lesions. Cervical swabs were collected from 75 women diagnosed with low grade squamous intraepithelial lesions (LSIL) (12 HIV+), high grade squamous intraepithelial lesions (HSIL) (12 HIV+; 12 HIV-), atypical squamous cells of undefined significance (ASC-US) (3 HIV+; 4 HIV-), and atypical squamous cells high grade (ASC_H) (11 HIV+; 2 HIV-) and negative for intraepithelial lesion or malignancy (NILM) (7 HIV+; 12 HIV). Samples with normal cytology were used as negative controls. HPV genotyping was done using the Hybrispot HPV direct flow chip kit and the CINtec-Plus kit was used for p16/Ki-67 dual staining. Overall, 65% (49/75) of participants tested positive for HPV, of which the majority were PLWH (69%; 34/49). A large proportion of participants tested positive for hr-HPV (87%; 43/49) and 67% (29/43) of those were PLWH. The five most predominant hr-HPV types detected were HPV 16 (28%; 14/49), HPV 35 (18%; 9/49), HPV 33 (16%; 8/49), HPV52 (16%; 8/49) and HPV53 (16%; 8/49). Preliminary results showed that p16/Ki-67 dual staining could be detected in 40% (21/52) of precancerous samples, of which 62% (13/21) were from PLWH. Results showed that hr-HPV could be detected in 85% (17/20) of the samples positive for p16/Ki-67 dual staining. Detection of hr-HPV and p16/Ki-67 dual staining could be useful tools to identify women at risk of developing cervical cancer.

Abstract 10

Correlation between lung function tests and peak oxygen consumption in post-TB lung disease

Dr Brett Curry[1], Dr Emily van't Wout[2], Dr Elizna Maarsdorp[3], Dr Andre Nortje[4], Prof Elvis Irusen[4], Mr David Maree[4], Prof Coenraad Koegelenberg[4], Prof Brian Allwood[4]

[1]Department Of Medicine, Stellenbosch University And Tygerberg Hospital, Cape Town, South Africa, [2]Division of Pulmonology, Department of Medicine, Leiden University Medical Centre, Leiden, Netherlands, [3]Faculty of Medicine and Health Sciences, Division of Molecular Biology and Human Genetics, Stellenbosch University, Cape Town, South Africa, [4]Division of Pulmonology, Department of Medicine, Stellenbosch University and Tygerberg Hospital, Cape Town, South Africa

Biography:
Internal Medicine Registrar Department Of Medicine, Stellenbosch University And Tygerberg Hospital.
Diploma of Primary Emergency Care, College of Medicine South Africa, 2016
MBChB, University of Cape Town 2013
Creator of @TBHMedicine on Twitter
Passionate about Medical Education

BACKGROUND
After TB treatment, many patients have post-TB lung disease (PTLD), associated with increased mortality and morbidity. Nevertheless, relationships between lung function testing and exercise capacity in people with PTLD are poorly understood.

METHODS
This single-centre study investigated the association between lung function testing and peak oxygen consumption (VO2peak) and percentage-predicted VO2peak (VO2peak (%pred)) in adults with PTLD investigated for surgery.

RESULTS
Eighty-two patients (52 males, 30 females) with a mean age of 43.2 years (SD 11.3) were included. Spirometric values of forced vital capacity (FVC) percentage predicted (%pred) and forced expiratory volume in 1 sec (FEV1) %pred suggested significant correlations with VO2peak (%pred) (P , 0.001 and P , 0.001), whereas FEV1/FVC did not. Diffusing capacity for carbon monoxide (DLCO) %pred also correlated significantly with VO2peak (%pred) (P ¼ 0.002). However, the magnitude of all significant correlation coefficients were weak. No significant correlations for any plethysmographic values with VO2peak (%pred) could be robustly concluded. Correlations with VO2peak (ml/kg/min) for most physiological variables were less robust than for VO2peak (%pred).

CONCLUSIONS
Although statistically significant, the correlations between any measure of lung function and VO2peak or VO2peak (%pred) were weak, with only FVC correlation coefficient surpassing 0.50.

Abstract 11

The association between acid-base status and clinical outcome in critically ill COVID-19 patients admitted to ICU with an emphasis on high anion gap acidosis

Dr Owen Wiese[1], Prof Annalise Zemlin[1], Mr Lovemore Sigwadhi[1], Dr Thumeka Jalavu[1], Prof Peter Nyasulu[1]
[1]*Stellenbosch University, Bellville, South Africa*

Biography:
Dr Owen J Wiese is a registrar in the division of Chemical Pathology at Stellenbosch University and the National Health Laboratory Service at Tygerberg Academic Hospital. He holds a BSc and MB,ChB degrees from Stellenbosch University.

Background: Arterial blood gas (ABG) abnormalities are expected in patients admitted to the intensive care unit (ICU) due to critical illness, including severe acute respiratory syndrome and acute kidney injury (AKI). Our aim was to identify ABG abnormalities, with a focus on a high anion gap (AG) metabolic acidosis and evaluate outcomes in COVID-19 patients admitted to the ICU.
Methods: A retrospective, observational study was conducted in a tertiary hospital in Cape Town during the first two COVID-19 waves. Demographics, electrolyte and ABG findings, kidney function and lactate levels were obtained from prospectively collected records from COVID-19 patients older than eighteen years. The Pearson $\chi 2$ test or Fisher exact test was used for categorical variables and the Wilcoxon rank-sum test for continuous variables to compare mortality and survival. To identify factors associated with non-survival, a multivariable model for demographics, comorbidities, and laboratory parameters was developed.
Results: This study included 465 patients, 226 (48%) of whom were female. The sample population's median (IQR) age was 54.2 (46.1-61.3) years, and 63% died. ABG analyses found that 283 (61%) had alkalosis (pH ≥7.45), 67 (14%) had acidosis (pH ≤7.35), and 117 (25%) had normal pH (7.35-7.45). In patients with alkalosis, 199 (70.3%) had a metabolic alkalosis and in those with acidosis, 42 (64%) had a metabolic acidosis with an increased AG of more than 17. Non-survivors were older (56.4 years versus 50.3 years, $p < 0.001$). Age, gender, lactate levels, diabetes and eGFR were not associated with increased AG metabolic acidosis.
Conclusion: Most COVID-19 patients admitted to the ICU had an alkalosis, with acidosis predicting a worse prognosis. Higher AG metabolic acidosis was not associated with patients' characteristics. Our findings are significant in lowering the risk of mortality among COVID-19 patients in the ICU, indicating that a more aggressive clinical approach is required.

Abstract 12

Preferences for tuberculosis preventive therapy among children, adolescents, and caregivers in South Africa: A discrete choice experiment.

Mr Abenathi Mcinziba[1], Mr Micheal Strauss[2], Dr Graeme Hoddinott[1], Mr Dillon Wademan[1], Ms Mohhadiah Rafique[1], Ms Lucia Jola[1], Ms Chantel Streicher[1], Dr Karen Du Preez[1], Dr Muhammad Osman[1], Dr Jody Boffa[3], Prof. Harry Hausler[4], Prof. Anneke Hesseling[1], Prof. Yael Hirsch-Moverman[5]

[1]Desmond Tutu TB Centre, Stellenbosch University., Tygerberg Campus, Cape Town, South Africa, [2]Health Economics and HIV and AIDS Research Division, University of KwaZulu-Natal, Durban, South Africa, [3]The Aurum Institute, TB Think Tank., Johhanesburg, South Africa, [4]TB HIV Care, Cape Town, South Africa, [5]International Center for AIDS Care and Treatment Program, Columbia University., New York, United States of America

Biography:

Abenathi Mcinziba is a junior study coordinator and a PhD Candidate at the Department of Pediatrics and Child Health, Desmond Tutu TB Centre, Stellenbosch University. He upholds MPhil in Transdisciplinary Health and Development Studies and specializes in qualitative research with skills including research design, data collection, processing, and analysis. He has coordinated studies on the field, focusing on HIV and TB in resource-constrained settings. His ambition is to become an established researcher focusing on local social and health systems around HIV and TB.

Background: TB preventive therapy (TPT) is a critical strategy to end TB. Yet implementation, especially among children, remains poor. With new South African guidelines expanding TPT eligibility and regimens, we sought to determine TPT preferences among children, adolescents, and their caregivers to inform TPT scale-up efforts.

Methods: We undertook a discrete choice experiment (DCE) with children (8-14 years-old), adolescents (15-19-years-old), and caregivers of children in 25 primary health facilities (PHCs), Cape Town. The DCE included eight attributes (location, waiting time, treatment duration, dosing frequency, formulation/size, side effects, packaging, and taste) with 2-4 choice levels per attribute, which were informed by previous and following stakeholder engagement. Participants selected between two hypothetical scenarios across eight choice sets, using a fractional factorial, main effects design. Mixed effects binary logistic regression models were used for the analysis of choice data.

Findings: Overall, 171 children, 170 adolescents, and 173 caregivers completed the DCE. We found that children preferred TPT regimens with smaller pills, which had no side effects, and were not bitter. Adolescents preferred TPT care in PHCs rather than at home, with short waiting times, few clinic visits, and no side effects. Caregivers preferred easily administered regimens with less frequent dosing and no side effects. We found a general preference for fewer, smaller pills. None of the groups considered dispersible formulations to be significantly preferable to film-coated formulations with two small pills.

Conclusions: Smaller and better tasting formulations were preferred. Shorter TPT regimens and reduced number of clinic visits were not primary drivers of choice and were unlikely to affect TPT uptake in isolation. Heterogeneity between groups suggests that choices between regimens may be needed even among same household members, although family-centred approach may help to bridge these differences. Consideration of fast-track TPT services in PHCs may improve uptake and completion, especially among adolescents.

Abstract 13

Clinical features and outcomes of COVID-19 admissions in a population with a high prevalence of HIV and tuberculosis: a multicentre cohort study

Dr. Arifa Parker[1], Dr. Linda Boloko[2], Dr. Muhammad Saadiq Moolla[1], Dr. Nabila Ebrahim[3], Prof Birhanu T Ayele[4], Dr. Alistair GB Broadhurst[1], Dr. Boitumelo Mashigo[1], Dr. Gideon Titus[1], Dr Timothy De Wet[2], Dr Nicholas Boliter[3], Dr. Michael-Jon Rosslee[2], Dr. Nectarios Papavarnavas[2], Dr. Riezaah Abrahams[1], Prof. Marc Mendelson[2], Dr. Sipho Dlamini[2], Dr. Jantjie J Taljaard[1], Dr. Hans W Prozesky[1], Dr. Abdurasiet Mowlana[1], Dr. Abraham J Viljoen[1], Dr. Neshaad Schrueder[1], Prof Brian Allwood[1], Dr Usha Lalla[1], Prof Joel A Dave[2], Prof Greg Calligaro[2], Prof Dion Levin[2], Dr Deborah Maughan[2], Prof Ntobeko AB Ntusi[2], Prof Peter S Nyasulu[4], Prof Graeme Meintjes[2], Prof Coenraad FN Koegelenberg[1], Dr. Ayanda T Mnguni[3], Prof Sean Wasserman[2]

[1]Department of Medicine, Stellenbosch University and Tygerberg Hospital, , , [2]Department of Medicine, University of Cape Town and Groote Schuur Hospital, , , [3]Department of Medicine, Stellenbosch University and Khayelitsha Hospital, , , [4]Division of Biostatistics and Epidemiology, Stellenbosch University, ,

Biography:

Dr. Arifa Parker is an Infectious Diseases specialist working in the Department of Medicine at Stellenbosch University and Tygerberg Hospital. She is enrolled in the PhD program looking at COVID-19 and co-morbidities. Research interests include the relationship between NCDs and infections, outbreaks, HAI's, antimicrobial resistance, HIV and TB. She is also president-elect of the Infectious Diseases Society of Southern Africa.

Background

There is still a paucity of evidence on the outcomes of coronavirus disease 2019 (COVID-19) among people living with human immunodeficiency virus (PWH) and those co-infected with tuberculosis (TB), particularly in areas where these conditions are common. We describe the clinical features, laboratory findings and outcome of hospitalised PWH and human immunodeficiency virus (HIV)-uninfected COVID-19 patients as well as those co-infected with tuberculosis (TB).

Methods

We conducted a multicentre cohort study across three hospitals in Cape Town, South Africa. All adults requiring hospitalisation with confirmed COVID-19 pneumonia from March to July 2020 were analysed.

Results

PWH comprised 270 (19%) of 1434 admissions. There were 47 patients with active tuberculosis (3.3%), of whom 29 (62%) were PWH. Three-hundred and seventy-three patients (26%) died. The mortality in PWH (n = 71, 26%) and HIV-uninfected patients (n = 296, 25%) was comparable. In patients with TB, PWH had a higher mortality than HIV-uninfected patients (n = 11, 38% vs n = 3, 20%; p = 0.001). In multivariable survival analysis a higher risk of death was associated with older age (Adjusted Hazard Ratio (AHR) 1.03 95%CI 1.02-1.03, p < 0.001), male sex (AHR1.38 (95%CI 1.12-1.72, p = 0.003) and being "overweight or obese" (AHR 1.30 95%CI 1.03-1.61 p = 0.024). HIV (AHR 1.28 95%CI 0.95-1.72, p 0.11) and active TB (AHR 1.50 95%CI 0.84-2.67, p = 0.17) were not independently associated with increased risk of COVID-19 death. Risk factors for inpatient mortality in PWH included CD4 cell count < 200 cells/mm3, higher admission oxygen requirements, absolute white cell counts, neutrophil/lymphocyte ratios, C-reactive protein, and creatinine levels.

Conclusion

In a population with high prevalence of HIV and TB, being overweight/obese was associated with increased risk of mortality in COVID-19 hospital admissions, emphasising the need for public health interventions in this patient population.

Abstract 14

Determination of the transcriptomic effects and compensatory role of inhA promoter mutation in Mycobacterium tuberculosis

Miss Leah Mwendwa[1], Dr Monique Barnard[1], Dr Vuyo Mavumengwana[1], Dr Johannes Loubser[1], Dr. rer. nat Christian Utpatel[2], Dr Lindsay Sonnenkalb[2], Prof. Dr. rer nat Stefan Niemann[2], Distinguished Prof Rob Warren[1], Dr Marisa Klopper[1]

[1]Stellenbosch University, Cape Town, South Africa, [2]Research Center Borstel, Borstel, Germany

Biography:

Leah Mwendwa holds a First class honors award for BSc Industrial Biotechnology from Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya. She joined the division of MBHG at Stellenbosch University in 2021 as a DAAD In-region scholar to pursue MSc in Molecular Biology. She studies as part of the TB Genomics group and her MSc project focuses on RNAseq and the compensatory role of the inhA promoter mutations in M. tuberculosis. She also has an interest in bioinformatics analysis of RNAseq and WGS.

Background:

The inhA C-15T promoter mutation (IPM) confers resistance to both Isoniazid and Ethionamide in Mycobacterium tuberculosis. The frequency of IPM has been observed to increase with the progression of TB resistance (from MDR, through pre-XDR to XDR-TB), and has hence been proposed to be a gateway for the development of XDR-TB. In clinical atypical Beijing genotype strains, ethA mutations have been unexpectedly observed to occur first, followed by katG mutations, and inhA promoter mutations last. We hypothesised that IPM confers a fitness advantage over wild-type M. tuberculosis strains in the absence of additional drug-resistance mutations. RNAseq data of clinical isolates with IPM show upregulation of the mabA-inhA-hemZ operon. We aimed to determine whether IPM alone is sufficient to cause upregulation of the mabA-inhA-hemZ operon and whether additional transcriptomic effects could be observed. We used an inhA C-15T promoter mutant generated from H37Rv by site-directed mutagenesis in this transcriptomic study.

Methods:

RNA was extracted at mid-log phase using FastRNA Pro Blue kit (MP Biomedicals) per the manufacturer's instructions, six replicates each of the mutant and progenitor were prepared. RNA quality/integrity was checked on Agilent 2100 Bioanalyzer. Sequencing libraries were prepared using Zymo-Seq RiboFree Total RNA Library Kit as per the manufacturer's instructions. cDNA libraries were sequenced using the Illumina NextSeq 550 Series platform. RNAseq data were analyzed using R software (DEseq2 v1.36).

Results:

RNA integrity (RIN) was above 7.0. For each sample, 9 million properly paired reads were generated and a minimum of 90% were mapped to the reference genome. Differential gene expression analysis showed that the inhA operon genes (mabA, inhA and hem Z) were significantly upregulated in the inhA promoter mutant strain (adjusted p-value < 0.05), while no other genes were significantly differentially expressed.

In conclusion, inhA C-15T upregulates the mabA-inhA-hemZ operon, without any additional transcriptomic effects.

Abstract 15

"Why can't we do it for TB?": tuberculosis programme stakeholders' perspectives on lessons from the COVID-19 response in South Africa

Mrs Hanlie Myburgh[1], Mr Dillon Wademan[1], Dr Graeme Hoddinott[1], Dr Sue-Ann Meehan[1], Dr Muhammad Osman[1,2]

[1]Desmond Tutu TB Centre, Stellenbosch University, Tygerberg, South Africa, [2]School of Human Sciences, Faculty of Education, University of Greenwich, , United Kingdom

Biography:

Hanlie Myburgh is a member of the Socio-behavioural Science team at the Desmond Tutu TB Centre, Stellenbosch University and a PhD candidate at the University of Amsterdam. Her research is cross-disciplinary, drawing from anthropology and public health, with two intersecting foci: 1) health service delivery and patient-provider relationships in the context of chronic infectious disease (e.g., shifts from conventional paternalistic modes of service delivery towards person-centred approaches to care); and 2) understanding health services as microcosms of the broader historical and social contexts of which they are a part.

Background and objectives

The COVID-19 pandemic has negatively impacted current global TB control efforts. It has also sparked unprecedented global and local innovation and collaboration. In South Africa, health system recovery measures were implemented to address the significant decline in people diagnosed and treated for TB due to COVID-19. We aimed to understand lessons from the South African COVID-19 response from the perspective of TB programme stakeholders.

Method

We conducted interviews with provincial and district-level managers (n=12) in the Western Cape and KwaZulu-Natal provinces, and facility-level TB staff (n=26) in 12 primary health care facilities (mix of high and low TB burdens). We analysed these data as case descriptions.

Results

Managers perceived that the COVID-19 response generated multi-sectoral collaboration that improved the quality and speed of policy development and implementation. To address COVID-19-related reductions in accessibility, health workers offered less frequent DOT, opportunities for medication home delivery, and more weeks/months' medication supply to reduce clinic attendance. TB contact management suffered poor implementation due to limited resources and urgency compared to COVID-19. A call centre implemented in the Western Cape provided widespread support to people diagnosed with COVID-19. Integration with routine data systems allowed people with COVID-19 at high-risk for adverse health outcomes to be identified and supported. In KwaZulu-Natal work with traditional healers and community gatekeepers helped to debunk COVID-19 related myths and garner community support for health interventions. Participants opined that mask-wearing in facilities and screening all clients for TB outside facilities should remain. All participants shared that greater public awareness of TB is needed in our high-burden context.

Conclusion

The COVID-19 pandemic has shown that with political will, simplified, streamlined responses integrated within routine services can attain wide population reach in South Africa. We must learn from COVID-19 to help restore and maximise benefits to the TB programme.

Abstract 16

Characterization of Mycobacterium bovis persisters from South Africa

Miss Pamela Ncube[1], Dr Bahar Bhageri[1], Prof Michele Miller[1], Prof Samantha Sampson[1]

[1]*DSI/NRF Centre of Excellence for Biomedical Tuberculosis Research, South African Medical Research Council Centre for Tuberculosis Research, Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:

Pamela Ncube was a shared MSc student with the Host-Pathogen and Animal TB research groups, and her research focused on the characterization of Mycobacterium bovis persister formation in the South African wildlife population from 6 different locations. She is now a PhD student and her project aims to validate the in vitro acid stress model applied to M. bovis during her MSc, explore the macrophage infection models, and examine molecular mechanisms involved during these stress conditions. Understanding M. bovis persister formation will build a foundation for understanding whether latency (an asymptomatic state of tuberculosis) exists in animals.

Mycobacterium tuberculosis infection in humans can either progress to disease or be contained and lead to a latent infection without evidence of active disease. It is unknown whether a similar scenario exists in animals infected with Mycobacterium bovis. Since management strategies may differ for latently infected animals, it is important to evaluate whether M. bovis can form persisters, believed to underlie latent infection. Here, we aimed to characterize M. bovis persister formation upon in vitro acid stress which mimics the macrophage phagolysosome microenvironment. Samples (n=23) from naturally infected M. bovis wildlife species were decontaminated, purified, and genotyped. Spoligotyping identified 5 different M. bovis spoligotypes. Twenty-two of the 23 isolates were successfully transformed with the Fluorescent Dilution reporter plasmid pTiGc. Growth curves confirmed that there were no growth defects of the transformants due to the carriage of the reporter plasmid. Three M. bovis strains were selected for persister assay experiments and subjected to in vitro acid stress, which is believed to enrich for persisters [reflected by a sub-population of viable but non- or slowly replicating bacteria (VBNR)]. Laboratory strains, Severely Attenuated Mutant of M. tb::pTiGc and BCG::pTiGc, had the highest VBNR mean percentage of cells of 12.2 ± 1.5% and 7.2 ± 0.6% (± SD), respectively on day 4. The VBNR mean percentages of clinical M. bovis varied from 0.2 ± 0.0%. to 1.3 ± 0.1%. These data suggest that upon acid stress: (i) laboratory strains have a higher propensity to form VBNR populations than three clinical isolates examined, (ii) M. bovis may demonstrate VBNR populations following acid stress, although these are very small, (iii) VBNR formation may vary depending on strain genotype. Notably, the small VBNR populations detected under the conditions employed in this study (0.5 ± 0.6 %) were as expected, supported by previous studies conducted on bacterial persisters.

Abstract 17

Polygenic risk score for prediction of tuberculosis susceptibility in an admixed South African population

Carene Anne Alene Ndong Sima[1], Prof Marlo Möller[1], Dr Caitlin Uren[1], Dr Haiko Schurz[1], Prof Emile Chimusa[2]
[1]Stellenbosch University, Cape Town, South Africa, [2]University of Cape Town, Cape Town, South Africa

Biography:
Carene Ndong Sima is a first-year PhD candidate in Human genetics. Her current subject is on pharmacokinetics of anti-TB drugs in southern African patients. Originally from Gabon, she is excited to see what this journey holds for her.

To curb the death toll caused by tuberculosis (TB), screening measures need to be scaled up to identify genetically at-risk individuals. Polygenic risk scores (PRS) are able to assess an individual's genetic risk to a trait. However, similar to genome-wide association studies (GWAS), PRS have mostly been assessed not only in European populations but also for non-communicable diseases and traits. Little is known about how to effectively construct PRS in more genetically complex populations.
We explored different approaches for constructing PRS for prediction of TB susceptibility in a multi-way admixed South African population. By doing so, we assessed and compared the predictive performance of three PRS construction tools (PRSice2, LDpred2, and Lassosum2) and evaluated the predictive power of different combinations of TB-PRS models and nongenetic factors. Our results showed that LDpred2 consistently yielded better prediction accuracy compared to the non-Bayesian PRS models and notably, we observed a 18% relative loss of power for PRSice2. Additionally, we showed that the linear mixture of PRSs outperforms models that use a single discovery population. We attained 22% relative improvement in prediction accuracy with the multi-ethnic model compared with single-population PRS models. Furthermore, we demonstrated an association between age and TB risk, in addition to an increased predictive power when combining of genetic and nongenetic risk factors (AUC [95%CI]=0.61937 [0.54306 – 0.69323]). Our study showed that the choice of the PRS tool used can greatly influence the predictive accuracy of PRS models in an admixed population. Additionally, we highlight that in the event that nongenetic factors are strongly associated with disease outcome, their inclusion in a linear mixture of risk models can result in a substantial gain in prediction power.

Abstract 18

Application of WGS to predict resistance in Mycobacterium tuberculosis strains to drugs in the new XDR-TB regimen

Mr Justice Tresor Ngom Ngom[1], Dr Elizabeth Streicher[1], Dr Marisa Klopper[1], Dr Hanno Loubser[1], Pr Robin Warren[1]

[1]DST-NRF Centre of Excellence for Biomedical Tuberculosis Research/SAMRC Centre for Tuberculosis Research, Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, Cape Town, South Africa

Biography:

Justice Tresor NGOM is PhD candidate in Molecular Biology in TB Genomics research Unit, Stellenbosch University. His research interests lie in molecular biology and evolution of pathogens that cause disease burdens (TB and co-infections, zoonotic pathogens), specifically genomic epidemiology, molecular diagnostics, and drug resistance mechanisms of TB. He has a strong desire to understand the spread, evolution, and interactions of pathogens among humans, animals, and the environment. Ideally, this will help predict outbreaks, preserve human and animal health, and conserve the environment. He hopes to participate in improving the molecular surveillance of resistant pathogens and rapid molecular diagnostic methods.

Background: Extensively drug resistant tuberculosis (XDR-TB) is currently defined by the WHO as TB that is resistant to isoniazid, rifampicin, any fluoroquinolone, and either bedaquiline or linezolid (or both), following a change in the XDR treatment regimen. We aimed to describe the impact of a new XDR definition and regimen in the context of samples collected during a period where the old definition was used.

Methodology: Whole genome sequences of isolates collected between 2007-2019, phenotypically determined to be XDR-TB as per the old definition, were analysed using an in-house WGS analysis pipeline and TB-profiler. A phylogeny was generated and TB-profiler used to predict resistance associated with mutations, based on both the new and old XDR-TB definition. R v3.6.1 was used for analyses.

Results: Of the 743 old definition XDR samples investigated, only 10 were XDR by the new definition. Additionally, we have identified some variants associated with new and repurposed drugs in this cohort even though there was limited use of these drugs during this time, which warrants further investigation.

Conclusion: By using WGS we were able to find variants associated with resistance to the new and repurposed drugs used in current drug resistant TB regimens. This will theorically change the way that this group of patients should be treated and demonstrated WGS as a valuable tool for routine diagnostics and monitoring of drug resistant TB treatment.

Key words: XDR-TB, WGS, genotypic DST, molecular diagnostics

Abstract 19

Characteristics and outcomes of infective endocarditis in South Africa: A retrospective cohort study

Dr Simon Poerstamper[1], Dr Alfonso JK Pecoraro[1], Prof Anton F Doubell[1]
[1]*SU, ,*

Biography:
General Internal Medicine registrar with a special interest in Cardiology and a growing appreciation for infective endocarditis.

Background
Infective endocarditis(IE) remains a disease with significant morbidity and mortality for a predominantly young group of patients in South Africa. There is a paucity of data assessing contemporary outcomes of IE in South Africa, limiting our ability to institute strategies to improve the outcome of patients with IE in South Africa.
Methods
A retrospective cohort of patients with IE was established from healthcare records for the period of 1 January 2017 to 31 December 2018. A profile of clinical, laboratory, microbiologic, echocardiographic, surgical and morbidity and mortality data was compiled for each patient.
Results
A total of 75 patients with definite IE were included in this study. The mean age was 39.6 years with a male preponderance(68%). Mortality at six months (all cause) was 34.7% and embolic complications were common, especially cerebral embolism(21%). Rheumatic heart disease(RHD) was present in 28% of the cohort. A high rate of blood culture negative IE(BCNIE) was present(62.7%). In patients with a positive blood culture, Staphylococcus aureus(43%) and the viridans group of streptococci(32%) were the most common causative organisms.
Conclusion
IE in South Africa remains a disease with a significant mortality rate despite the young age of the patients affected. The high rate of BCNIE is a likely contributor to the associated adverse outcomes. Some of the features of IE in South Africa have evolved to resemble a profile of disease similar to cohorts from high-income countries with a Staphylococcal predominance and a reduction in underlying RHD as predisposing risk factor.

Abstract 20

Altered cardiac structure and function in newly diagnosed people living with HIV: A prospective cardiovascular magnetic resonance study after the initiation of antiretroviral treatment

Dr Pieter-Paul Robbertse[1,2], Prof Anton Doubell[1], Mr Jan Steyn[1], Prof Carl Lombard[3,4], Dr Mohammed Talle[1,5], Dr Philip Herbst[1]

[1]Division of Cardiology, Faculty of Medicine and Health Sciences, Stellenbosch University , Cape Town, South Africa, [2]University of Pittsburgh HIV-Comorbidities Research Training Programme in South Africa, Cape Town, South Africa, [3]Biostatistics Unit, South African Medical Research Council, Cape Town, South Africa, [4]Division of Epidemiology and Biostatistics, Department of Global Health, Stellenbosch University, Cape Town, South Africa, [5]Department of Medicine, Faculty of Clinical Sciences, College of Medical Sciences, University of Maiduguri, , Nigeria

Biography:

I am a researcher-clinician that strives to improve the understanding and expertise of cardiovascular disease in a resource constrained South Africa. I completed my MBChB degree cum laude at Stellenbosch University in 2015. I recently submitted my PhD dissertation titled "Prospective evaluation of the presence, profile and evolution of asymptomatic cardiovascular disease in treatment naïve, HIV-infected patients using cardiac magnetic resonance imaging after initiation on antiretroviral therapy."

Background

HIV associated cardiomyopathy (HIVAC) is a poorly understood entity that may progress along a continuum. We evaluated a group of persons newly diagnosed with HIV and studied the evolution of cardiac abnormalities using cardiovascular magnetic resonance imaging imaging (CMR) after the initiation of antiretroviral therapy (ART).

Methods

We recruited a group of newly diagnosed, ART naïve persons with HIV and a healthy, HIV uninfected group. Participants underwent comprehensive cardiovascular evaluation, including a contrasted CMR study. The HIV group was started on ART and re-evaluated 9 months later. The cardiovascular parameters of the study groups were compared at diagnosis and after 9 months.

Results

The ART naïve group's (n=66) left- and right end diastolic volume for height were larger compared with controls (n=22) ($p<0.03$). The left ventricular mass for height was larger in the naïve group compared with controls ($p=0.04$). The ART naïve group had decreased left- and right ventricular ejection fraction ($p<0.03$) and negative, non-linear associations with high HIV viral load ($p=0.02$). The left ventricular size increased after 9 months ($p=0.04$), while the systolic function remained unchanged. The HIV group had a high rate of non-resolving pericardial effusion.

Conclusion

HIV infected persons demonstrate structurally and functionally altered ventricles at diagnosis. High HIV viral load was associated with left- and right ventricular dysfunction. Cardiac parameters and pericardial effusion prevalence did not show improvement with ART. Conversely, a concerning trend of increase was observed with left ventricular size. These subclinical cardiac abnormalities may represent a stage on the continuum of HIVAC that can progress to symptomatic disease if the causes are not identified and addressed.

Abstract 21

Host genetic factors contributing to the susceptibility to COVID-19

Ms Chrystal Steyl[1], Dr Ibtisam Abdullah[2,12], Dr Deepthi Abraham[4,6], Dr Sihaam Boolay[1], Dr Zivanai Chapanduka[2,12], Dr Helena Cornelissen[2,12], Ms Natrisha Damons[10], Dr Brigitte Glanzmann[1,11], Prof Richard Glashoff[3,12], Prof Sian Hemmings[7], Dr Judith Hornby[9], Dr Sauliegh Kamedien[13], Prof Craig Kinnear[1,11], Dr Elouise Kroon[1], Mr Hendrik La Grange[9], Ms Deanah Lloyd[1], Dr Tongai Maponga[5], Prof Marlo Möller[1], Dr Shane Murray[9], Dr Shiraz Patel[14], Dr Desiree Petersen[1,15], Dr Lindsay Petersen[10], Prof Helena Rabie[6], Ms Denise Scholtz[1], Dr Aubrey Shoko[9], Dr Timothy Sparcklen[8], Dr Caitlin Uren[1], Dr Gert van Zyl[5,12], Ms Annecke Vermeulen[1], Dr Kate Webb[8]

[1]Division of Molecular Biology and Human Genetics (Stellenbosch University), Cape Town, South Africa, [2]Division of Haematological Pathology (Stellenbosch University), Cape Town, South Africa, [3]Division of Medical Microbiology and Immunology (Stellenbosch University), Cape Town, South Africa, [4]Division of Paediatric Rheumatology and Immunology (Stellenbosch University), Cape Town, South Africa, [5]Division of Medical Virology (Stellenbosch University), Cape Town, South Africa, [6]Department of Paediatrics and Child Health (Stellenbosch University), Cape Town, South Africa, [7]Department of Psychiatry (Stellenbosch University), Cape Town, South Africa, [8]Department of Paediatrics and Child Health (University of Cape Town), Cape Town, South Africa, [9]Centre for Proteomic and Genomic Research (CPGR), Cape Town, South Africa, [10]Artisan Biomed, Cape Town, South Africa, [11]South African Medical Research Council (SAMRC) Genomics Centre, Cape Town, South Africa, [12]The National Health Laboratory Service (NHLS), Cape Town, South Africa, [13]N1 Hospital, Cape Town, South Africa, [14]Thembani Khayelitsha Surgical Centre, Cape Town, South Africa, [15]South African Medical Research Council (SAMRC) CTR, Cape Town, South Africa

Biography:

Chrystal Steyl completed her BSc (Human Life Science) degree at Stellenbosch University in 2019, majoring in Genetics and Physiology. In 2020 she joined the TB Host Genetics group in the Division of Molecular Biology and Human Genetics to complete her Hons degree. For her MSc degree she remained in the group but also became part of the COVID-19 Host Genetics research group where her current project involves identifying host genetic variants that might contribute to the susceptibility to COVID-19 disease. Chrystal is also in the process of upgrading this project to a PhD.

Towards the end of 2019, the world faced the emergence of the COVID-19 pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). To date, most research has been dedicated to elucidating the disease pathology and pathogenesis, however knowledge gaps such as the inter-individual variability of host responses remain. Most individuals are asymptomatic or develop mild disease, however, some do develop severe and critical disease. What is of particular interest are individuals who develop extreme phenotypes despite being young without any underlying comorbidities. Further, a novel rare and severe clinical syndrome in previously healthy children related to SARS-CoV-2 has been described, namely Multisystem Inflammatory Syndrome in Children (MIS-C). A dysregulation of the immune response in these extreme phenotypes is clear and host genetic factors have been proposed as a contributor which may leave these individuals more susceptible to COVID-19. However, published literature on COVID-19 human genetic susceptibility has been predominantly from first world countries with limited data from Africa. In the current study, whole genome sequencing (WGS) and data analysis of individuals who have been admitted with severe/critical COVID-19 disease or MIS-C at Tygerberg Hospital and Red Cross Children's Hospital, in the Western Cape of South Africa, has been performed. The generated WGS data was submitted to an in-house prioritisation tool, TAPER, which identified rare genetic variants associated with immune system pathways. Although still ongoing, this study may provide the first direct association between MIS-C and genetic susceptibility in an Africa population while also providing a better understanding of the genetic basis of COVID-19 pathogenesis in humans. It may also lead to additional research involving novel prophylactic treatments and revised treatment strategies. Further, it will highlight the need for more human genetic research in Africa to ensure that the continent more swiftly contributes human genetic data during future pandemics.

Abstract 22

Culture-independent PCR detection and differentiation of Mycobacteria spp. from antemortem paucibacillary respiratory from African elephants and rhinoceros in South Africa.

Dr Wynand Goosen[1], Ms Charlene Clarke[1], Dr Léanie Kleynhans[1], Dr Tanya Kerr[1], Dr David Cooper[2], Dr Peter Buss[3], Prof Michele A. Miller[1]

[1]DSI–NRF Centre of Excellence for Biomedical Tuberculosis Research, South African Medical Research Council Centre for Tuberculosis Research, Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, Tygerberg, South Africa, [2]Ezemvelo KwaZulu-Natal Wildlife, Mtubatuba, South Africa, [3]Veterinary Wildlife Services, Kruger National Park, South African National Parks, Skukuza, South Africa

Biography:

Dr Goosen is a Wellcome Trust International Fellow, National Geographic Explorer, Chairman of the Wildlife Disease Association Africa and Middle East and Biosafety and Environmental Ethics Committee member. He received the Vice Rector's Postdoctoral Award for Exceptional Achievements in 2020 and he was identified every year for the last 4 years as one of the top 10 emerging researchers in South Africa by the NSTF. He has published 34 peer-reviewed papers in international journals, 10 first-author, 8 senior and 16 co-author. He also presented at 4 international conferences upon invitation and graduated 3 PhDs, 2 MSc and 1 Hons student.

Abstract: Mycobacterium tuberculosis complex (MTBC) members and environmental non-tuberculous mycobacteria (NTM), frequently infect various wildlife species like African elephants and rhinoceros. In some cases, infections can lead to disease, but even if they do not, NTM infections can prime the host's immune system to react to shared proteins between NTM and MTBC like M. bovis and M. tuberculosis. Consequently, this sensitization can then interfere with tests used to screen for bovine tuberculosis, producing false-positive test results in M. bovis-uninfected animals. This result can lead to issues with moving animals due to rejected permits and possibly even unnecessary euthanasia. Unfortunately, the only definitive way of detecting MTBC and NTMs is by culture, a technique that cannot by itself distinguish between NTM and MTBC and requires a minimum of 8-week incubation. Research has demonstrated these consequences can occur in South African wildlife and NTM have been isolated from their environments. Therefore, in this study, we aimed to enhance the culture-independent surveillance for MTBC and NTMs by improving the antemortem rapid detection and differentiation of Mycobacteria spp. by PCRs and subsequent amplicon sequencing directly from respiratory samples. Used in combination, veterinarians and managers will be able to thoroughly identify infecting Mycobacterium species and confirm the absence or presence of possible cross-reactive NTM species that may impede M. bovis diagnostics and/or cause disease.

Abstract 23

Humoral response to human cytomegalovirus and risk of pulmonary tuberculosis in adolescents: a case-control study

Dr Jeremi Swanepoel[1], Prof Gert Van Zyl[2], Prof Anneke Hesseling[1], Prof David Moore[3], Prof James Seddon[1]
[1]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Division of Medical Virology, Department of Pathology, Faculty of Medicine and Health Sciences, Stellenbosch University and National Health Laboratory Service, Cape Town, South Africa, [3]TB Centre, London School of Hygiene and Tropical Medicine, London, United Kingdom

Biography:
Jeremi is an early-career researcher from Cape Town, South Africa. He obtained his medical degree from Stellenbosch University in 2016 and completed his Master of Science in Tropical Medicine and International Health at the London School of Hygiene and Tropical Medicine in 2021. He is currently assisting as a clinician-researcher at the Desmond Tutu TB Centre where he is involved with a variety of adolescent TB and lung health related research projects. He is also a clinical research manager for the HIV Mental Health Research Unit at the University of Cape Town and involved with the CONNECT study.

Background
Emerging evidence suggests a link between infection with herpes viruses, particularly human cytomegalovirus (HCMV), and progression to tuberculosis (TB) disease. We aimed to determine whether there is an association between humoral responses to HCMV and Epstein-Barr Virus (EBV) and the risk of TB in adolescents.

Design/ Methods
An unmatched case-control study was conducted amongst adolescents aged 10-19 years enrolled in an observational study (Teen TB), between November 2020 and November 2021, in Cape Town, South Africa. Fifty cases with pulmonary TB and 51 healthy controls were included. Demographics and clinical data were obtained, and serum samples at enrolment were tested for HCMV IgG and EBV Nuclear Antigen (EBNA) IgG using two automated enzyme immunoassays. Odds ratios (ORs) were estimated using unconditional logistic regression.

Results
The median age of 101 participants was 15 years (interquartile range [IQR] 13 to 17) and 55 (54%) were female. All participants were HCMV IgG seropositive and 95% were EBNA IgG seropositive. Individuals with TB had higher IgG levels than healthy controls (p=0.04). Individuals with HCMV IgG values in the upper tertile had a 3.7 times greater odds of pulmonary TB disease compared with IgG levels in the lower tertile (95%CI: 1.05–12.84; p=0.04). There was a trend for increasing odds of pulmonary TB with increasing level of HCMV IgG (p=0.04). In contrast, there was no trend of increased odds of TB with higher EBNA IgG values.

Conclusions
There is a high prevalence of HCMV and EBV amongst adolescents in this high-TB burden setting. The magnitude of HCMV IgG response may be associated with an increased risk of pulmonary TB in adolescents. Improved characterisation of the immunological interaction between HCMV and M. tuberculosis would permit targeted development of host-directed therapies and TB vaccines.

Theme 2 - Non-Communicable Diseases / Tema 2 – Nie-Oordraagbare Siektes

Abstract 24

The incidence and outcomes of high-risk acute coronary syndromes in the Western Cape Province of South Africa: a prospective cohort study

Dr Jacob Cilliers[1]
[1]*Tygerberg Hospital, Cape Town, South Africa*

Biography:
I am a medical registrar at Tygerberg Hospital,currently in my third year.

Background:
Tygerberg Hospital(TBH), a tertiary care hospital in the Western Cape, South Africa, serves a large, low to middle income(LMIC) population with centralised advanced cardiac care. Acute coronary syndrome(ACS), remains the principal cause of death locally, despite a high burden of communicable diseases, including HIV.

Objectives:
We sought to describe the incidence and mortality rates of ST elevation myocardial infarction(STEMI) and high-risk non-ST elevation ACS(HR-NSTEACS) in the region and identify population-based risk characteristics and comorbidities.

Methods:
Tygerberg Acute Coronary Syndrome Registry (TRACS) is a prospective database that captures all STEMI and HR-NSTEACS patients in the TBH referral network. Patients older than 18 years, presenting with STEMI or HR-NSTEACS, were included prospectively over a 9-month surveillance period. Patients' demographic and risk factor profiles, in hospital therapies and 30-day mortality rates were collected.

Results:
586 patients were enrolled (64.5% male) with incidence rates of STEMI and HR-NSTEACS of 14.7/100 000 and 15.6/100 000 respectively Mean patient age was 58.1yrs with STEMI patients younger than those with HR-NSTEACS (56yrsvs.58yrs; p=0.01). Coronary artery disease(CAD) risk factors were overall prevalent with hypertension (79.8%vs.68.3%; p<0.01), and pre-existing CAD (29%vs.7%; p=0.03), more prevalent in the HR-NSTEACS group. HIV was present in 12.6% of patients tested, similar to the background population rate. The 30-day all-cause mortality was 6.1% with in-hospital mortality rate 3.9%, and was similar for STEMI(6.7%) and HR-NSTEACS(5.7%,P=0.83). HIV positivity did not impact mortality.

Conclusions:
A contemporary approach to treating ACS in a LMIC setting yields mortality rates comparable to high income countries. However, the lower-than-expected overall incidence rates in a young population with relatively high proportion of STEMI and high-risk factor burden suggests potential under recording of CAD in the region. CAD outcomes in people living with HIV(PLHIV) was similar to those without, suggesting traditional risk factors drive CAD outcomes in the region.

Abstract 25

Imatinib resistance: The role of pharmacogenetic variability in a South African chronic myeloid leukemia cohort

Miss Chantal De Long[1], Dr Nomusa Mashigo[2], Dr Fatima Bassa[1], Dr Jurie Jordaan[1], Mr Faghri February[1], Dr Carmen Swanepoel[1,2]

[1]Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Services, Cape Town, South Africa

Biography:

Chantal De Long is a final year Master in Pathology student at Stellenbosch University. She received a Bachelors's degree in Biotechnology at the University of the Western Cape and a BSc Honours degree in Pathology at Stellenbosch University. Her current research focus is Imatinib resistant mechanisms in Chronic Myeloid Leukemia patients in South Africa.

Background

Drug-resistant cancers are often associated with poor patient outcomes and burden an already strained healthcare system. The underlying resistance mechanism is poorly understood, however Chronic Myeloid Leukemia (CML) serves as a useful disease model. For CML, highly effective therapies, such as tyrosine kinase inhibitors, particularly the first-line drug Imatinib, have been developed. Unfortunately, approximately 20-30% of patients do become resistant to Imatinib. Variability in patient drug response could be due to single nucleotide polymorphisms (SNPs) in genes that encode for Imatinib-metabolizing enzymes and transporters.

Aims and objectives

The overall aim of the study is to evaluate the effect of selected SNPs located within genes(CYP3A4/3A5 (Cytochrome P450), OATP1A2 (SLCO1A2), OCTN1 (SLC22A4), and hOCT1 (SLC22A1) that encode selected drug transporters has on drug uptake, particularly Imatinib and to determine if these SNPs contribute to an alternative mechanism leading to Imatinib resistance in a South African cohort.

Method

A maximum of 44 samples from Imatinib-resistant CML patients will be analyzed. The patient's treatment response will be monitored using the GeneXpert and the selected SNPs will be analyzed using PCR-based genotyping assays. In addition, 44 non-resistant CML patients will be included as controls.

Results

Provisional data for SNPs SLC22A1 (rs628031) and CYP3A4 (rs2740574) suggest that the SNPs are more prevalent in the non-resistant group with 25% and 77.2% of patients having the SNPs as opposed to the 7.89% and 68.1% of patients having the SNP in the resistant group, respectively. However, the data should be analyzed along with the data of other SNPs in the study to determine the poor outcome of imatinib treatment in CML patients.

Conclusion

The anticipated results would aid in determining whether the selected SNPs contribute to Imatinib resistance and to identify potential biological predictors of outcome which could help improve patient treatment stratification.

Abstract 26

IL1-Ra and soluble VCAM-1 are associated with left ventricular dysfunction in systemic lupus erythematosus.

Dr Riette Du Toit[1], Dr Phillip Herbst[2], Prof Helmuth Reuter[3], Prof Novel Chegou[4]
[1]Division of Rheumatology, Stellenbosch University and Tygerberg Hospital, Parow, South Africa, [2]Division of Cardiology, Stellenbosch University and Tygerberg Hospital, Parow, South Africa, [3]Department of Medicine, Stellenbosch University and Tygerberg Hospital, Parow, South Africa, [43]Stellenbosch University Immunology Research Group, Parow, South Africa

Biography:
I am a rheumatologist with research interests in systemic aspects of rheumatological disease as well as serological/immune pathways involved in these conditions.
I completed my PhD on myocardial injury in systemic lupus erythematosus with ongoing research in the field of lupus myocarditis. I supervise MMed and MPhil dissertations in various aspects of rheumatological diseases.
I am actively involved in AFLAR, sharing the vision of improving rheumatological services research capacity in the African continent.
I aim to inspire as a teacher, to improve the quality of life of the patients I treat, and to contribute to relevant research.

Introduction:
Interleukins (IL) play a key role in the activation of immune pathways, leading to the phenotypical expression of systemic lupus erythematosus (SLE). IL-18 enhances expression of vascular cell adhesion molecule-1 (VCAM-1), mediating myocardial inflammation / contractile dysfunction in viral myocarditis and ischaemic cardiomyopathy (CMO). IL-1Ra, IL-18 and soluble VCAM-1 (sVCAM-1) is associated with SLE-associated myocardial inflammation demonstrated by cardiac magnetic resonance. Limited information is available on cytokine pathways involved in SLE-associated myocardial dysfunction.
Objectives:
To identify markers of endothelial activation and cytokine mediators of myocardial dysfunction in SLE.
Methods:
A prospective cross-sectional study was done at Tygerberg Hospital including adult SLE patients. Serum cytokine (IL-1β, IL-1Ra, IL-2, IL-6, IL-10, IL-17, IL-18, TNF-alpha) and sVCAM-1 levels were compared with regards to echocardiographic functional analyses. Patients with established non-SLE cardiac pathology were excluded.
Results:
Forty-one patients were included. Patients were young (29 years [±10]) females (87.8%) with high disease activity (SLEDAI-2K) (med:14; IQR:9-16.5). Six patients (14.6%) had clinically evident lupus myocarditis (LM). TNF-alpha correlated with all cytokines, except for IL-18. sVCAM-1 positively correlated with IL-18 (r=0.419; p=0.006), IL-6 (r=0.333; p=0.033) and TNF-alpha (r=0.440; p=0.004) as well as lupus disease activity (r=0.485; p=0.003). Left ventricular ejection fraction (LVEF) negatively correlated with sVCAM-1 (r=-0.329; p=0.041) but not TNF-alpha nor IL-18. Patients with an LVEF<55% had higher levels of sVCAM-1 (p=0.012). IL-1Ra (p=0.02) and sVCAM-1 levels (p=0,09) were higher in patients with echocardiographic evidence of regional LV dysfunction.
Conclusion:
Our findings suggest that IL-1Ra, IL-18 and sVCAM-1 are potential mediators of LV dysfunction in SLE, similar to what is described in ischaemic and viral CMO. Exploring tissue expression of sVCAM-1, IL-18 and IL1-Ra will provide valuable information regarding their pathogenetic role and identify possible new therapeutic targets in patients with LM.

Abstract 27

The mutational landscape of Philadelphia chromosome-negative myeloproliferative neoplasms in the Western Cape Province, South Africa

Dr Marthinus Dicks[1], Dr Ibtisam Abdullah[1], Dr Carmen Swanepoel[1], Dr Zivanai Chapanduka:[1]
[1]*National Health Laboratory Service, Cape Town, South Africa*

Biography:
Dr Thinus Dicks completed his undergraduate MBCHB degree at the University of Pretoria 2013.

He has also worked as a medical officer with the Stem Cell Transplantation Service at St James's Hospital in Dublin and completed an MPhil in Genomic Medicine, focusing on clonal haematopoiesis, at the University of Cambridge.

He is currently a registrar in haematopathology at the Stellenbosch-Tygerberg NHLS. His MMed project is focused on myeloproliferative disorders.

Introduction: Philadelphia chromosome-negative myeloproliferative neoplasms (MPNs) are driven by a limited number of mutations occurring at different frequencies in populations. These frequencies have been poorly documented in the genetically diverse South African population. Information about the mutational landscape of MPNs can guide diagnostic testing, treatment options and disease prognosis.

Objective: To describe the genetic mutations seen in MPNs in a South African population.
Methods: A retrospective descriptive study of patients diagnosed with an MPN at a South African state sector tertiary academic hospital over a twelve-year period was conducted. Information available on the Laboratory Information System (LIS) was used to construct a profile of genetic mutations in MPNs.

Results: There were 113 patients diagnosed with an MPN over the twelve-year period. Primary Myelofibrosis (PMF) was the commonest MPN (37%), followed by Polycythaemia Vera (PV) (30%) and Essential thrombocythaemia (ET) (15%). JAK2 V617F was the most frequent mutation (75%), followed by CALR type 1 and type 2 mutations (8%). Triple-negative MPNs amounted to 5%. There were no mutations found in MPL or JAK2 exon 12. In PMF, patients with JAK2 V617F mutations were older and had higher haemoglobin at diagnosis when compared to patients without JAK2 V617F. One case of ET had a CALR variant not previously described in the literature.

Conclusion: The mutational landscape of MPNs in this cohort differs from international studies. The frequency of JAK2 V617F in PMF and ET within this study is higher than reported internationally. Additionally, the absence of MPL and JAK2 exon 12 mutations contrasts with several international studies. The spectrum of mutations needs to be investigated and local guidelines on diagnostic workflow, treatment and prognosis need to be developed.

Abstract 28

The therapeutic efficacy of Ascorbic acid 2 phosphate, N-acetylcysteine and Metformin against diabetes mellitus associated cellular senescence.

Saiuree Govender[1], Dr Maritza Kruger[2], Dr Rabia Johnson[3], Dr Mari van de Vyver[2]
[1]Division of Medical Physiology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Division of Clinical Pharmacology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]South African Medical Research Council, Cape Town, South Africa

Biography:
Full name is Saiuree Govender, currently in her 2nd year of Masters in Medical Physiology and studying at Stellenbosch University (Tygerberg Campus).
Supervisor is Dr Mari van de Vyver and Co-supervisor is Dr Rabia Johnson.

Background
Type 2 diabetes is an escalating global epidemic. The diabetic microenvironment consists of high levels of glucose (hyperglycaemia); chronic inflammation and oxidative stress which together cause DNA damage, promote continuous telomere shortening and induce premature cellular senescence. The accumulation of senescent cells is strongly associated with disease progression and the onset of co-morbidities. The purpose of this research study was to develop a physiologically relevant in vitro model of premature cellular senescence associated with diabetes and test the therapeutic efficacy of various preventative and/or restorative agents.

Methodology
This study was performed using a human adipose tissue derived stromal cell line. Serial passaging was done to determine the onset of replicative senescence and eliminate it as a confounder. Premature cellular senescence was induced in low passage cells using a combination of high glucose (25mM), advanced glycation end products (AGE-BSA) (400ug/mL) and tumour necrosis factor alpha (TNFa) (0.02 ug/mL). The ratio of senescent vs non-senescent cells was assessed using SA β-gal (Senescence associated β-galactosidase) staining and confirmed using qPCR (P53, P16, P21). Following a dose response experiment, the therapeutic efficacy of either preventative or restorative N-acetylcysteine (NAC), ascorbic acid 2 phosphate (AAP) and Metformin treatment was assessed.

Results
By mimicking the diabetic microenvironment in culture, the combination of high glucose, AGE-BSA and TNFa induced a 3-fold increase in the ratio of senescent to non-senescent cells, and suppressed p21 expression. Pre-treatment as well restorative treatment using either AAP (0.6mM), NAC (3.75mm) or Metformin (200µg/mL) effectively prevented the onset of senescence and restored cellular function.

Conclusion
In conclusion, this study confirmed that a diabetic environment can induce premature senescence in ADSCs. The use of antioxidant (AAP and NAC) and hypoglycaemic (Metformin) supplementation as therapeutic strategy to prevent premature cellular senescence in diabetes can be of potential benefit to prevent disease progression.

Abstract 29

Incidence and one-year survival in elderly South Africans starting kidney replacement therapy

Santosh Thapa[1], Thabiet Jardine[1,2], Thaabit Davids[2], Fergus Caskey[3], M Razeen Davids[1,2]
[1]Division of Nephrology, Department of Medicine, Stellenbosch University and Tygerberg Hospital, Cape Town, South Africa, [2]South African Renal Registry, Cape Town, South Africa, [3]Population Health Science Institute, University of Bristol, Bristol, United Kingdom

Biography:
Medical registrar

Background: Recent data suggests that the one-year survival of South African patients on kidney replacement therapy (KRT) is comparable to that of more developed countries and identified older age as a risk factor for inferior survival. This paper is the first to report on the incidence, treatment modalities and one-year survival of elderly patients on KRT in South Africa.

Methods: The cohort included patients with kidney failure aged 65 years and older, who initiated KRT between 1 January 2013 and 30 September 2018. We collected data on potential risk factors for mortality. The Kaplan-Meier method was used to estimate one-year patient survival, while the Cox proportional-hazards model was used to determine the association of risk factors with survival.

Results: The cohort comprised 1866 patients. The median age was 71.1 years, 62.7% had diabetes mellitus, and 93.2% had haemodialysis as their first KRT modality. Nearly all patients (99.0%) received KRT in the private sector. A total of 243 patients died within 1 year of initiating KRT, and overall survival was estimated at 86.4% (95% confidence interval 84.8–88.0%). Higher mortality was associated with older age, White and Indian ethnicity, and residence in certain provinces. Neither diabetes mellitus, primary kidney disease nor sex were independently associated with one-year survival.

Conclusions: The findings of this study are in line with data from elsewhere, confirming inferior survival in elderly patients on KRT. Since KRT is a severely limited resource in South Africa, the results may inform rationing policies and more equitable delivery of KRT in South Africa.

Abstract 30

Evaluation of hand labelling of Lutetium-177-PSMA-I&T according to radiopharmaceutical quality control parameters

Mr Sandile Sibiya-Mrwetyana[1,2], Ms Bolutife Adedeji[1], Ms Samantha Du Plessis[2], Prof Sietske Rubow[1], Dr Janke Kleynhans[1]

[1]Division of Nuclear Medicine, Cape Town, South Africa, [2]NTP Radioisotopes SOC Ltd, Pelindaba Brits, South Africa

Biography:

Mr Sandile Sibiya graduated in 2014 from the University of the Witwatersrand with a B.Pharm. He registered in 2016 as a Pharmacist and performed his community service at Sharpville Community Health Centre. He joined NTP Radioisotopes SOC Ltd in 2017 and first performed the scope of practice of a production pharmacist until being promoted to the designation of Quality Assurance Responsible Pharmacist in 2020. He is currently enrolled for the MSc in Nuclear Medicine specializing in Radiopharmacy.

Lutetium-177 is a radionuclide with wide popularity in the incorporation in radiopharmaceutical for the treatment of tumours . As such, methods of labelling with receptor radionuclide peptides for therapy are in high demand as these will facilitate the production of doses in nuclear medicine facilities. The benefits and drawbacks of these methods need to be evaluated to allow Nuclear Medicine Facilities to make an informed decision regarding which is optimal for the unique environment they are located in.

Synthesis using the hand labelling method enlists lutetium-177 n.c.a (n = 11) from NTP Radioisotopes SOC Ltd and iTM Medical isotopes added to PSMA-I&T (purchased from Germany). The radiopharmaceutical was compounded aseptically using an ascorbic acid buffer to maintain a pH of 4.5 to 5.5. The reaction was incubated at 95ºC for 25 min. Quality aspects such as Radiochemical purity tests (≥99%), sterility tests, and visual inspection was performed and analyzed to get baseline data. The next phase of the study will evaluate automated synthesis and compare it with manual labelling. Operator radiation exposure will also be monitored.

All manual labelled [177Lu]Lu-PSMA production proved to be well controlled with an experienced operator by achieving the prerequisite radiochemical purity specification (≥99.9%), achieving an average purity of 99.95 ± 0.07%. The same was observed for the radionuclidic purity of all labelled doses, which maintained an average of 99.91 ± 0.04 %. Of the eleven labelled batches evaluated, none were observed to be out of specification for pH (4.5-5.5) and all sterility and filter integrity testing complied with the specification.

The manual labelling method for [177Lu]Lu-PSMA is well controlled. Radiation protection aspects of hand labelling need to be further investigated and compared to other available methods (automated synthesis and manual labelling with lyophilized kits).

Abstract 31

The development of an LC-MS/MS method to detect species specific snake venom toxins in human plasma

Me Anné Lermer[1], Me Carine Marks[1], Dr Nicolaas Maré Vlok[2], Dr Tracy Ann Kellermann[1]

[1]Division of Clinical Pharmacology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Central Analytical Facility, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

Biography:

Ms Anné Lermer completed her BSc undergraduate studies majoring in Botany and Biochemistry, followed by BSc honours in Biochemistry at the University of South Africa. She completed her MSc in Pharmacology at Stellenbosch University. Her masters research topic was Toxicology, more specifically biological toxins. Here her focus was on snake venom toxins and their use in diagnostics and drug discovery and development in snakebite envenomation. Currently she continues her research in this field as a PhD (Clinical Pharmacology) student in the Division of Clinical Pharmacology at Stellenbosch University.

Background

Snakebite envenomation in sub-Saharan Africa significantly threatens human health. Antivenom is required to reverse toxicity, but species identification is imperative. No rapid diagnostics are available for identification of responsible species. The aim of this study is to develop an LC-MS/MS method for the rapid species-specific detection of venom toxins from human plasma.

Methods

An epidemiological study on incidence of snakebite in South Africa as reported to Poisons Information Helpline of Western Cape (PIHWC) was performed to provide rationale for the analytical study. Analytical methodology includes identification of species-specific venom toxins by high resolution (HR) LC-MS/MS, fractionation of Naja nivea venom by size exclusion chromatography and compositional analysis of fractions by HR-LC-MS/MS. Venom fractions were screened for toxicity using a zebrafish model, utilising DanioVision for behavioral tracking. Thereafter, a triple quadrupole LC-MS/MS method was developed containing species-specific toxins.

Results

Analysis of PIHWC call data showed that in 44% of snakebite cases the causative species were unidentified. Naja nivea, Bitis arietans and Bitis atropos were identified as most medically significant species in South Africa and consequently included in the study. N. nivea venom was chosen for fractionation after identification of common peptides from inter-region venom unique to the species. After exposure to sub-lethal concentrations of N. nivea venom fractions, significant ($p < 0.0001$) changes in larval behaviour were observed in two treatment groups compared to the control. Using transitions generated during HR-LC-MS/MS analysis, FASTA files were generated and converted into MRM's on the triple quadrupole LC-MS/MS. Toxins were positively identified from human plasma by LC-MS/MS.

Conclusion

Triple quadrupole LC-MS/MS can be used for the specific diagnosis of envenomation in human plasma, although optimization is required. This is a proof of concept towards the goal of developing a low-cost point of care diagnostic for snakebite envenomation with utility in rural communities.

Abstract 32

Association between PBD adherence and cardiometabolic risk profile in commercial taxi drivers

Tatum Lopes[1,2], Annalise E Zemlin[2,3], Machoene D Sekgala[4,5], Zandile J Mchiza[1,4], Rajiv T Erasmus[2], Andre P Kengne[1,6]

[1]Non-Communicable Diseases Research Unit, South African Medical Research Council, Tygerberg, South Africa, [2]Division of Chemical Pathology, Department of Pathology, Faculty of Medicine and Health Sciences, University of Stellenbosch, Tygerberg, South Africa, [3]National Health Laboratory Service, Tygerberg Hospital, Tygerberg, South Africa, [4]School of Public Health, University of the Western Cape, Bellville, South Africa, [5]Human and Social Capabilities, Human Sciences Research Council, Cape Town, South Africa, [6]Department of Medicine, University of Cape Town, Cape Town, South Africa

Biography:

Tatum is a young medical science researcher from Cape Town, South Africa. In 2017, she joined the South African Medical Research Council (SAMRC) to gain work experience as a junior scientist at the non-communicable diseases research unit. She is currently registered as a PhD candidate in Chemical Pathology at Stellenbosch University with the SAMRC as her host institution. During this period, she has developed skills in community-based research. Her research aims to investigate the association between plant-based diets and cardiovascular disease risk in Africa. Through her research Tatum hopes to contribute to the fields of nutritional epidemiology, and public health.

BACKGROUND

Consumption of unhealthy foods and having a sedentary lifestyle predispose individuals to non-communicable diseases (NCDs). This study investigated the association between plant-based diet (PBD) adherence and cardiometabolic risk in high-risk commercial taxi drivers.

METHODS

Secondary cross-sectional analysis was conducted among commercial taxi drivers who consumed street foods sold by vendors in the Cape Metropole. Two hundred and thirty-seven commercial taxi drivers were conveniently sampled from two main taxi ranks namely Bellville and Cape Town. A validated questionnaire was administered to obtain quantified dietary data using a 24-hour recall and fasting blood samples were collected for biochemical analysis. Statistical analyses were performed by study area to determine the association between PBD adherence and cardiometabolic risk, while adjusting for energy intake and age in the regression models.

RESULTS

The analytic sample consisted of 189 males with a mean age of 40 ± 10.6 years. Taxi drivers operating in Cape Town had significantly greater PBD adherence than those in Bellville: 45% vs 22% for the overall PBD index (PDI), p=0.003; 26% vs 25% for the healthful PBD index (hPDI), p=0.004; and 33% vs 23% for the unhealthful PBD index (uPDI), p=0.320. hPDI was positively associated with fasting high-density lipoprotein cholesterol (HDL-C) and negatively associated with triglyceride levels; standardised beta co-efficient (β) = 0.148, p=0.043 and β = -0.145, p=0.046, respectively. Logistic regression analysis revealed a sustained positive association between hPDI and fasting HDL-C; adjusted odds ratio (AOR) = 1.82, 95% confidence intervals (95% CI): 1.15-2.88, p=0.011. Surprisingly, hPDI had a positive association with hs-CRP >3 mg/L; AOR=1.54, 95%CI:1.00-2.38, p=0.051.

CONCLUSION

Greater adherence to the hPDI was positively associated with HDL-C and subclinical inflammation in commercial taxi drivers. These preliminary findings need confirmation and larger and more elaborated studies, in order to be exploited for prevention and control interventions.

Abstract 33

Analysis and comparison of acute toxicities in hypofractionation radiotherapy vs standard fractionation radiotherapy in head and neck cancers over a period of 12 months at Tygerberg hospital.

Dr George Joram[1], Dr Komeela Naidoo[1], Dr Begg Waleed[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
I'm currently third year MMed student in Radiation Oncology at Tygerberg Campus/Hospital. My main interest is in Gynecological and Urology cancers especially in Brachytherapy treatment

Abstract

Background
Radiation or concurrent chemoradiotherapy remains an important modality in management of head and neck cancers and is associated with significant acute toxicity. There is no data on frequency and severity in the Southern Africa setting and this study aims to address this topic
Objectives
The primary objective was to report the grade and prevalence of acute toxicities in patients receiving hypofractionated radiotherapy and standard fractionation radiotherapy with or without concurrent chemotherapy. Secondary objectives were to describe the patterns of toxicities, time of occurrence, severity and any association with the descriptive variables such as smoking status and treatment volume.
Methods
This was a retrospective study. Data on acute toxicity during treatment, and on first visit at 6 weeks post treatment were collected
Results
A total of 44 patients were treated with radical intent and 39 patients were included in the analysis after excluding 5 due to incomplete data. Median age was 58 years (range 23-73). Twelve patients (30.8%) received
concurrent chemoradiation and 27 (69.2%) received radiation only. Eleven patients (28.2%) received 55 Gy in 2.75Gy per fraction, while 28 (71.8%) received 60-70 Gy in 2Gy per fraction. Thirty-eight (97%) patients reported mucositis and dysphagia during treatment and only three (7.6%) experience grade ≥ 3 mucositis and dysphagia. Xerostomia was also reported by 38 (97%) patients and persisted at six weeks post treatment in 35 (90%) patients. Most grade 3 toxicity occurred in patients who were using tobacco at the time of
treatment. Treatment volume of ≥ 350cc was associated with grade ≥3 toxicity

Conclusions
Despite advance radiotherapy techniques, head and neck cancer patients still experience severe treatment-related toxicity affecting their quality-of-life during and post treatment. More detailed prospective studies with a prospective assessment of acute toxicity is required to accurately document the incidences and severity of acute radiation toxicity

Abstract 34

Hypertension does not influence aortic stenosis severity assessment using mean transvalvular gradient

J. Liebenberg [*a]; R. Laubscher [b]; A. Doubell [a]; P. Herbst [a]
[a] *Division of Cardiology, Department of Medicine, Tygerberg Hospital and University of Stellenbosch*
[b] *Institute for Biomedical Engineering, Department of Mechanical and Mechatronic Engineering, University of Stellenbosch*

Biography: J. Liebenberg - liebjurg@gmail.com

Background
Aortic stenosis (AS) and hypertension often coexist. The influence of hypertension on the diagnostic assessment of AS severity is unclear. To clarify the effect of hypertension on transvalvular gradient, requires a better understanding of the impact that blood pressure (BP) change has on left ventricular systolic pressure (LVSP). Also, the effect of mean flow rate and intrinsic left ventricular contractile function (elastance) on this interaction, needs clarification.

Objective
To evaluate the impact of hypertension on the diagnostic assessment of AS.

Methods
A validated, zero-dimensional electro-hydraulic analogue computer model of the cardiovascular system was used to evaluate the impact of hypertension and BP changes on LVSP and transvalvular gradients at various flow rates and left ventricular elastances.

Results
In AS, systolic arterial pressure changes are mirrored by directionally similar changes in the LVSP. Flow rate remains remarkably stable over a range of afterloads (flow rate reserve intact), followed by an inflection point where mean flow rate falls for subsequent increases in afterload (flow rate reserve exhausted). The magnitude of the change in LVSP per unit change in systolic arterial pressure is dependent on the presence/absence of left ventricular flow rate reserve. However, changes in systolic arterial pressure, even when mean flow rate reserve is absent, results in a clinically negligible change in the mean transvalvular gradient across a spectrum of LV elastances.

Conclusion
In the presence of severe AS, any change in mean transvalvular gradient due to a change in BP is mediated via change in mean flow rate. The magnitude of the impact that change in BP has on flow rate and transvalvular gradient (even at exhausted flow rate), is negligible and of doubtful clinical relevance. Transvalvular gradient is therefore a robust parameter of aortic stenosis severity that is not impacted by hypertension in a meaningful way.

Abstract 35

The Clinical Profile of HDL2 in the Western Cape Population of South Africa

Heena Narotam Jeena[1], Prof Jonathan Carr[1], Dr Ludo van Hillegondsberg[1]
[1]*Division of Neurology, Tygerberg Hospital and Stellenbosch University, Cape Town, South Africa*

Biography:
I am a fourth year registrar in the Division of Neurology at Tygerberg Hospital.
My previous Tygerberg Academic Year Day presentations include:
2013 poster: Knowledge, attitudes and practices regarding TB infection control among health science students in a TB-endemic setting (http://www.ijic.info/article/view/15502/10123).
2015 oral: Exploring Experiences of Expressive Aphasia in Brain Injury Patients (http://www.ijpcm.org/index.php/IJPCM/issue/view/28).

The Clinical Profile of HDL2 in the Western Cape Population of South Africa
Background: Huntington's Disease Like 2 (HDL2) is an autosomal dominant neurodegenerative disorder found only in black Africans and persons of mixed ancestry. It is postulated that the junctophilin-3 gene has a common founder mutation dating back to 2000 years ago in sub-Saharan Africa. CAG/CTG triplet repeat lengths range from 40-59 in affected individuals, however a larger expansion consisting of 63 repeats has been found in an individual of mixed ancestry.
Objective: To describe the radiologic and phenotypic variability of HDL2 in the mixed ancestry population.
Methods: Adults with genetically confirmed HDL2 were recruited from Tygerberg Hospital in Cape Town. Both quantitative and qualitative data were obtained from a combination of Unified Huntington's Disease Rating Scale (UHDRS), Montreal Cognitive Assessment tool (MoCA), medical records, interviews with family members, brain magnetic resonance imaging (MRI) and determination of repeat numbers.
Results: Earlier age at onset and increased disease severity were noted in succeeding generations. Bilateral caudate atrophy and generalized cerebral atrophy on MRI were common among all participants. All participants with motor symptoms as part of disease onset had concurrent behavioural and cognitive symptoms. Cognitive symptoms were more severely affected and ranged from irritability and anxiety to depression, apathy, disinhibition, and psychosis. UHDRS motor scores were significant for eye movement abnormalities and bradykinesia, and to a slightly lesser extent for tremor and dystonia.
Conclusions: Mixed ancestry HDL2 patients in the Western Cape present with severe and rapidly progressive cognitive and behavioural impairments, with less severe motor deficits. Chorea and dystonia are less commonly present than in Huntington's Disease.
Limitations: The sample size is small, due to the rarity of the disorder. The potential for bias was lessened by use of formal rating scales and use of external validators.

Abstract 36

DEFINING THE ROLE OF C-REACTIVE PROTEIN VALUES IN DIFFERENTIATING A FLARE FROM AN INFECTION IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

Dr Tholakele Sabela[1], Dr Riette Du Toit[2], Dr Farzana Moosajee[3]

[1]Division of Rheumatology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Academic Hospital , Cape Town , South Africa, [2]Division of Rheumatology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Academic Hospital , Cape Town , South Africa, [3]Division of Rheumatology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Academic Hospital , Cape Town , South Africa

Biography:

Tholakele Sabela is a fourth-year medical registrar in the Department of Internal Medicine. Completed her undergraduate studies at the University of Cape Town.

Special interest in renal medicine

Background: Differentiating between flare and sepsis in patients with Systemic Lupus Erythematosus (SLE) is challenging. No marker accurately differentiates between these two commonest causes of hospitalisation in SLE patients.

Objective: To determine the predictive value of C-reactive Protein (CRP) in differentiating a lupus flare from an infection in a hospitalized SLE patient; to determine cut-off values for CRP in differentiating SLE flare from sepsis, report on organisms cultured in hospitalized patients and in-patient mortality.

Methods: We reviewed clinical records of SLE patients admitted to the internal medicine department, Tygerberg Hospital. Recorded data included: demographic data; clinical characteristics; laboratory results and outcome of admission. Admissions were divided to either SLE flare or infection (proven by pathogen isolation).

Results: 145 patients were included. Patients were predominantly young (median age 27 years; IQR:22-41) females (89%). SLE flare accounted for 68.3% of admissions and sepsis for 31.7%. Among the 99 patients with a flare, SLE manifestations included lupus nephritis (58.6%), mucocutaneous disease (29.3%), serositis (24.2%), arthritis (22.2%) and hemolytic anaemia (22.2%). Among the 46 patients admitted with sepsis, pneumonia (11.7%), urinary tract infection (11%), and gastroenteritis (5.5%) were the most prevalent. Patients with sepsis were more frequently on glucocorticoid therapy (p=0.006) at the time of admission. Pathogens isolated included Escherichia coli 7.6%, Mycobacterium tuberculosis and Staphylococcus aureus (3.4% each). A combination of CRP ≥44mg/L, SLEDAI ≤11 and neutrophilia ≥5.9 x 109/L was predictive of sepsis (sensitivity:90.5%; specificity:83.3%; PPV:92.4%; NPV:79.5%; AUC:0.91) Seventeen (11.7%) deaths occurred during the study period of which 9 (52.9%;p=0.045) were sepsis related.

Conclusions: Sepsis is a major cause of mortality among patients with SLE. Differentiating between sepsis and flare in SLE patients remains challenging. Utilizing predetermined cut-off values for CRP combined with neutrophilia and low SLEDAI-2K score results in a higher diagnostic value for the detection of an infection.

Abstract 37

The detection of stress-related diseases: a unique method to discover circulatory phosphoproteins

Mr Logan Smith[1]

[1]*Division of Medical Physiology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:

My journey thus far includes an undergraduate degree in BSc Human Life Sciences with Psychology and an Honours degree in Physiological Sciences, both completed at the University of Stellenbosch. I am now in the final year of my MSc at our faculty's Division of Medical Physiology, where I focus on setting up a method for the detection of novel biomarkers to be used in the clinical setting. I am also passionate about translational research and helping the broader community. I thus aim to assist in preventing and limiting disease prevalence, specifically non-communicable diseases linked to chronic psychosocial stress.

Introduction: The World Health Organization identified psychosocial stress as the second leading cause of disability worldwide, with ~90% of chronic diseases related to the dysregulated activation of the stress system. Hence there is a robust impetus for the identification of novel, circulating biomarkers to earlier detect stress-related chronic diseases. Although protein phosphorylation changes can act as putative markers of pathophysiology, their relatively low abundance complicates extraction and identification from complex samples. This project therefore aimed to set up an enrichment method for circulatory phosphoprotein extraction, to be employed in a preclinical model of chronic psychosocial stress.

Materials and methods: Phosphoprotein enrichment was performed using functionalized magnetic particles in a mix of proteins and serum samples. Four purified proteins were used for testing the enrichment method prior to serum sample fractionation. The latter was obtained from a rat model of chronic stress. After particle removal, samples were washed, and the retained fraction eluted and stored. Fractions were thereafter analyzed using SDS-PAGE and proteins visualized using Coomassie and phospho-fluorescent staining.

Results and conclusion: Qualitative analysis of the gel images indicated fluorescent signals in specific fractions of the enriched sample. The strongest fluorescence was detected in the eluted fraction that was postulated to contain proteins of interest. This confirmed the successful enrichment of phosphorylated proteins in terms of the test proteins and stress model samples. This method will now be used to identify and validate biomarkers that can then be employed for the earlier detection of chronic stress-related diseases.

Abstract 38

Distinct sex-specific responses in a preclinical model of chronic stress.

Miss Minette Van Wyk[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
The systems of the human body have always fascinated me. From there my pursuit in Physiology. Cardio-metabolic conditions remain major burdens of disease globally and as a member of Prof MF Essop's research group I am investigating the links between chronic stress and the onset of cardio-metabolic diseases.

I completed my undergraduate degree, a BSc in Human Life Sciences, at Stellenbosch University and thereafter obtained my BSc (Hons). I am currently completing a MSc in Physiological Sciences.

I also work part time for Elevate Education. With our workshops we help school learners with study skills, exam preparation and time management.

Introduction. Psychological stress is an emerging problem with serious downstream complications such as the onset and progression of cardio-metabolic diseases. However, the underlying mechanisms promoting stress-related diseases remain relatively unclear. This study therefore aimed to establish an in vivo rat model of chronic stress with the eventual aim to gain greater insights into the onset and progression of such complications. Materials and Methods. Male and female Wistar rats were subjected to a 4-week restraint stress protocol versus matched controls. Following this, a behavioral test (elevated plus maze [EPM]) was performed together with an assessment of body weight changes and biochemical biomarkers to ascertain whether the model was successfully established. Results & Findings. Our data revealed that stressed male rats displayed a decreased percentage change in body weight over time versus controls ($p<0.01$). Furthermore, the male stressed group exhibited increased plasma corticosterone levels compared to controls ($p<0.01$), while no significant differences were detected for plasma adrenocorticotropic hormone (ACTH) concentrations. Male brain-derived neurotrophic factor levels (biomarker for neuronal survival and growth) were lower in the stress group versus controls ($p<0.05$). There were no significant weight changes for female rats. However, stressed females exhibited lowered plasma corticosterone levels versus controls, while also displaying higher plasma ACTH concentrations compared to the control group ($p<0.05$). Stressed females also displayed increased rears (as assessed by EPM test) versus matched controls ($p < 0.01$). Our findings reveal intriguing sex-based differences in response to a chronic restraint stress protocol, with males displaying a depressive-type phenotype while females exhibited a post-traumatic stress disorder phenotype. Sex-specific preclinical research can provide unique insights into the various mechanisms driving stress-related diseases and should lead to the identification of novel diagnostic and therapeutic targets.

Theme 3 – Global Health, Public Health and Health Systems / Tema 3 – Globale Gesondheid, Openbare Gesondheid en Gesondheidstelsels

Abstract 39

Investigating vaccine hesitancy in the City of Cape Town Metropolitan District

Elizabeth O. Oduwole[1,2], Prof. Hassan Mahomed[1,3], Prof. Charles Shey Wiysonge[2,4,5]

[1] Division of Health Systems and Public Health, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Francie van Zyl Drive, Tygerberg, Cape Town,, South Africa, [2]Cochrane South Africa, South African Medical Research Council, Francie van Zyl Drive, Tygerberg, Cape Town, , South Africa, [3]Metro District Health Services, Western Cape Government, Cape Town,, South Africa, [4]Division of Epidemiology and Biostatistics, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town,, South Africa, [5]HIV and other Infectious Diseases Research Unit, South African Medical Research Council, Durban,, South Africa

Biography:

Elizabeth O. Oduwole is a highly motivated African female researcher, with a deep passion for vaccine acceptance research. She is currently a Doctoral Candidate in the Department of Global Health, Faculty of Medicine and Health Sciences, University Stellenbosch. The speed and accuracy with which she developed a niche for her research in an area that is current and relevant are impressive. More so is the grit and tenacity with which she is pursuing her studies, forming useful research collaborative ties, tackling challenges, and timeously responding to matters as they arise.

Currently, Elizabeth has published five articles in international, peer-review journals.

Vaccine hesitancy, recently defined as “a motivational state of being conflicted about, or opposed to, getting vaccinated; this includes intentions and willingness”, is partly responsible for suboptimal levels of vaccination coverage in many parts of the world. The COVID-19 pandemic and the unprecedented measures to address it inadvertently aggravated the situation, making vaccine hesitancy-related recommendations of the WHO an urgent necessity. The contextual nature of vaccine hesitancy requires its investigation in various contexts. We present the findings and results of such investigations in our particular setting.

Methods and analysis

The study was conducted in three phases. The evidence synthesis phase utilized the framework for scoping review developed by Arksey and O’Malley in 2005 to scope the literature for tools and measures available to measure vaccine hesitancy in a ten-year period (2010-2019) which included the first nine years of the decade of vaccines. Key informants' interviews conducted with point-of-care vaccinators transcribed, coded, and analyzed thematically and narratively was the method used for the qualitative phase of the study. Basic descriptive statistics and log-binomial regression was employed in the quantitative phase which aimed to estimate the vaccine confidence levels of future healthcare workers in training and their trainers.

Results

The findings from the study's first phase confirmed the paucity of validated, contextually relevant tools in the WHO Africa region. Major drivers of vaccine hesitancy such as religion and internet misinformation were part of the findings from the qualitative phase; while the results of the quantitative phase revealed high levels of vaccine confidence among the study participants (≥ 95.5% of 1015).

Conclusion

Vaccine hesitancy is present in the City of Cape Town Metropolitan District, though not yet as pervasive as in other populations. Early stakeholder engagements and targeted interventions will assist in increasing the predominantly positive vaccination attitude of the populace.

Abstract 40

Exploring a metropolitan district's response during the first COVID-19 wave: applying a health systems resilience framework

Professor Rene' English[1], Professor Lilian Dudley[1], Ms Stacey Blows[1], Ms Nadia Russon[1], Ms Christaline Crowe[1], Ms Michele Pappin[1], Ms Charlyn Goliath[2], Ms Juanita Arendse[2], Dr Kathy Grammar[2], Dr Michael Phillips[2], Ms Patti Olckers[2], Ms Carol Dean[2], Dr Gio Perez[2]

[1]Stellenbosch University, Cape Town, South Africa, [2]Metropolitan Health Services. Western Cape Department of Health and Wellness, Cape Town, South Africa

Biography:

Professor René English is a Medical Doctor and Public Health Medicine Specialist. She has extensive experience in clinical and health systems research, health information management, monitoring and evaluation, in the development of responsive and innovative solutions for the public health system, and initiatives that address priority diseases. She has served as a co-editor for the South African Health Review and District Health Barometer publications on a number of occasions. She is currently the Head of the Health Systems and Public Health Division in the Department of Global Health in the Faculty of Medicine and Health Sciences at Stellenbosch University.

Introduction

In 2020, the Western Cape (WC) was the first epicentre of the COVID-19 pandemic in South Africa. This prompted health system and service preparedness and response with a focus epidemic preparedness, and containing and mitigating transmission. Using an operational health systems (HS) resilience lens, we report on a metropolitan district's pandemic response in terms of what makes a HS resilient and which actionable steps can be taken to ensure operational HS resilience.

Overview of approach

Using a multi-methods approach we conducted online individual and group reflections, online workshops and individual interviews. Managers and staff working within the district were participants. Using existing operational HS resilience frameworks we analysed and mapped the district's preparedness and response activities.

Results

Operational HS resilience was demonstrated through a range of actions and activities. Efforts to maintain core health service capability and maintain health care, critical infrastructure were demonstrated. Leadership, communication, the provision of timely finances and efforts to development and maintain collaborations and partnerships were also demonstrated. A range of administrative and operational actions were taken to ensure seamless and safe service delivery. The research also provided empirical research findings to validate the theoretically-derived resilience frameworks used in the analysis. The application of the framework had utility in identifying some areas that required strengthening within the health services.

Conclusions and recommendations

Operational resilience was demonstrated in the metropolitan district's COVID-19 response. Areas for strengthening should be prioritised and a post-recovery and more detailed preparedness plan devised for the future.

Abstract 41

SOUTH AFRICAN HEALTHCARE COST DRIVERS

Mr Milan Patel[1], Professor Sean Chetty[1]

[1]*Department of Anaesthesiology and Critical Care, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:
Currently in the final year of studies towards a Bachelor of Medicine, Bachelor of Surgery (MB,ChB).
Project ID: 24100, HREC Reference Number: U21/11/149

South Africa's constitution stresses the provision of universal healthcare, offering a large proportion of public capital to achieve this. Comprehensive data exists on private sector expenditure but there is a paucity of data within the public sector. This study aimed to examine the expenditure in the public healthcare budget and analyse cost drivers in the SA healthcare system, and to identify trends in healthcare cost drivers for the period 2000 to 2020.

Methods
A retrospective quantitative analysis of national and provincial public sector healthcare expenditure was conducted for the years 2000 to 2020. Public sector data was accessed from public records, and private sector data was accessed from the public records of the Counsel of Medical Schemes. Data was entered into a Microsoft Excel spreadsheet categorising expenditure into healthcare (HC) and non-healthcare (NHC(costs. Statistical analysis, to identify trends in expenditure, was performed.

Results
EC:
56% increase HC personnel, 61% increase HC expenditure
19% increase NHC personnel, 43% decrease NHC expenditure
Limpopo:
11% decrease HC personnel, 44% increase HC expenditure
23% decrease NHC personnel, 85% increase NHC expenditure
KZN:
5% increase HC personnel, 77% increase HC expenditure
4% decrease NHC personnel, 58% increase NHC expenditure
WC:
7% increase HC personnel, 38% increase HC expenditure
17% increase NHC personnel, 46% increase NHC expenditure
Gauteng:
24% increase HC personnel, 90% increase HC expenditure
40% increase NHC personnel, 109% increase NHC expenditure

Conclusion
Literature on public healthcare expenditure is lacking, indicating impaired transparency in interdepartmental spending trends. A larger proportion of funding is used for increased personnel within HC expenditure. There has been an increase in NHC expenditure despite a decline in personnel. This has implications on the implementation of future healthcare budgets

Abstract 42

Resources supporting trustworthy, rapid and equitable evidence synthesis and guideline development: Results from the COVID-19 Evidence Network to support Decision-making (COVID-END)

Michael McCaul[1], David Tovey[2], Taryn Young[1], Vivian Welch[3,4], Omar Dewidar[4], Mireille Goetghebeur[5], Tamara Kredo[6,7], Andrea Tricco[8,9,10], Rebecca Glover[11], Janice Tufte[12], Amir Qaseem[13], Reveiz Ludovic[14], Rebecca L. Morgan[15], Per Olav Vandvik[16], Ivan D. Florez[17,18,19]

[1]Centre for Evidence-based Health Care, Division of Epidemiology and Biostatistics, Department of Global Health, Stellenbosch University, South Africa, , South Africa, [2]Member, COVID-END secretariat 2020-21, , , [3]School of Epidemiology and Public Health, University of Ottawa, 600 Peter Morand Crescent, Ottawa, , , [4]Bruyère Research Institute, University of Ottawa, 85 Primrose Ave, Ottawa, Ontario, , , [5]Bruyère Research Institute, University of Ottawa, 85 Primrose Ave, Ottawa, Ontario, , , [6]Cochrane South Africa, South African Medical Research Council, South Africa, , , [7]Division of Clinical Pharmacology, Department of Medicine, Stellenbosch University, South Africa, , , [8]Division of Clinical Pharmacology, Department of Medicine, Stellenbosch University, South Africa, , , [9]Epidemiology Division and Institute of Health Policy, Management, and Evaluation, Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, , , [10]Queen's Collaboration for Health Care Quality Joanna Briggs Institute Centre of Excellence, Queen's University, Kingston, Canada, , , [11]Department of Health Services Research and Policy, Faculty of Public Health and Policy, LSHTM, , , [12]Cochrane Consumer, Seattle WA USA, , , [13]American College of Physicians, Philadelphia, Pennsylvania, USA, , , [14]Knowledge Translation Program, Evidence and Intelligence for Action in Health Department, Pan American Health Organization, , , [15]Department of Health Research, Evidence and Impact, McMaster University, Hamilton, Ontario, Canada, , , [16]Department of Medicine, Lovisenberg Diaconal Hospital, Oslo, Norway, , , [17]Department of Pediatrics and Childcare, Universidad de Antioquia, Medellín, Colombia, , , [18]School of Rehabilitation Science, McMaster University, Hamilton, Canada, , , [19]Pediatric Intensive Care Unit, Clinica Las Americas-AUNA, Medellin, Colombia, ,

Biography:

Michael, PhD, MSc Clin Epi, BTech EMC, is a clinical epidemiologist and emergency care clinician by background. As a senior lecturer in Epidemiology and Biostatistics, much of his works involves postgraduate teaching, research synthesis, knowledge translation and biostatistical consulting. His interests include meta-epidemiological research, evidence synthesis and guideline development. Michael has experience in conducting systematic reviews and has contributed as a guideline methodologist in various topics, including for the World Health Organisation. Michael co-coordinates the MSc Clin Epi programme and convenes various postgraduate modules and short courses.

Robust evidence syntheses, health technology assessments and trustworthy guidelines are the cornerstones of informed healthcare decision making and for moving the best-available research evidence into policy and practice. The COVID-19 pandemic and subsequent infodemic – the rapid spread and generation of accurate and inaccurate information – represents an unprecedented global challenge. COVID-19 therefore requires trustworthy, rapid, and equitable evidence syntheses and guidance to inform clinical and public health decisions. Towards providing solutions, the COVID-19 Evidence Network to support Decisionmaking (COVID-END) convened Working Groups aimed to support access to and use of high-quality existing evidence syntheses, guidelines and health technology assessments in more coordinated and efficient ways, balancing quality and timeliness. The working groups collaborated to develop a consolidated resource for evidence synthesis, clinical practice guidelines and health technology assessments. In this commentary, we present how COVID-END works and what became a joint mission of these working groups; consolidated resources to facilitate trustworthy, rapid and equitable evidence synthesis, health technology assessments and guidelines for public health and clinical practice. We also call for future efforts to further strengthen global and equitable collaboration within evidence synthesis and guidance, with potential impact beyond COVID-19.

Abstract 43

Perceptions and experiences of delays to accessing care for appendectomy in the Western Cape, South Africa

Miss Johnelize Louw[1,2], Prof Rene English[2], Prof. Peter Nyasulu[3,4], Prof Kathryn Chu[1,5]

[1]Centre for Global Surgery, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Division of Health Systems and Public Health, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa , [3]Division of Epidemiology and Biostatics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [4]Division of Epidemiology and Biostatics, School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa, [5]Department of Surgery, University of Botswana, Plot 4775 Notwane Rd, Gaborone, Botswana

Biography:

Ms. Louw is a virology and cancer science professional. She received her undergraduate degree in Chemical Biology, followed by an honour's degree in Medical Virology. She then completed her Master of Philosophy in Cancer Science, at the African Cancer Institute. All of her degrees were completed at the University of Stellenbosch. She is currently pursuing her doctorate in Health Systems and Public Health.

Background: Acute appendicitis is one of the most common emergency surgical conditions worldwide and timely access to appendectomy improves the resulting outcomes. The aim of this study was to identify delays to accessing care for appendectomy in the Western Cape province, South Africa.

Method: This qualitative study used semi-structured interviews involving purposively recruited general surgeons and former appendectomy patients. The Three Delays framework which categorizes delays into three phases: seeking, reaching, and receiving care, was used. Interviews were transcribed and translated, and thematic analysis was done using an inductive approach.

Results: There were 17 interviews with six surgeons and 12 post-appendectomy patients. The most common delays reported, are related to seeking care and receiving care. Factors associated with delays in seeking care included previous poor hospital experience, the use of over-the-counter medication, initial private doctor consultation to mitigate the long waiting times at government facilities, and perceived lack of severity of illness. Factors associated with delays in receiving care included initial misdiagnosis, lack of operating time, and delay due to prioritisation of more acute surgical emergencies.

Conclusion: This study is important because it identified the delays to accessing timely care for appendicitis patients who ultimately require appendectomy. Consequently, targeted interventions can be designed to mitigate the effect of these delays. Importantly, both pre and in-hospital factors contributed to delays to appendectomy care. Better health education on the symptoms of appendicitis may mitigate delays in seeking care and increasing surgical resources could reduce delays in receiving care. Understanding context-specific barriers to access to care could improve patient outcomes for acute appendicitis.

Abstract 44

Validating the SEFI® Tool (Self Evaluation of Food Intake) in hospitalized patients of South Africa.

Miss Alvine Steenkamp[1], Miss Nicolene Kruger[1], Miss Mekayla Betteridge[1], Miss Estelle van Rijn[1], Miss Amaris Snell[1], Miss Maryam Kollia[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
I'm an optimistic individual, ready to challenge and impact this world. My interest in nutrition started early, and I invested a lot of time researching this topic. I was fortunate to pursue my creative side and completed my Diploma as a Graphic designer in 2018. The year after, I enrolled on the Stellenbosch University BSc Dietetics course, and my passion and love for this beautiful field have grown. Currently, I am a proud final BSc. Dietetics student that has a clear, logical and practical approach to problem-solving. I hope to empower and bring forth the fundamental importance of nutrition.

Alvine Steenkamp, Nicolene Kruger, Mekayla Betteridge, Maryam Kollia, Estelle van Rijn, Amaris Snell, Prof Renée Blaauw.
Division of Human Nutrition, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

Nutrition status deteriorates during hospitalisation, with nutritional assessment seldom performed as staff are unskilled and untrained. Dietary intake is fundamental to nutritional assessment and directly impacts clinical outcomes of undernutrition. This cross-sectional descriptive study aims to validate the SEFI® tool in establishing the food intake of hospitalised patients in Cape Town, South Africa.

519 patients were screened, and 265 participants were recruited (48,1 years; IQR: 34.4-63.1; 53.2% male). After lunch, the SEFI® tool was completed to determine food intake, using two methods, the visual analogue scale and the assessment of the portions consumed. The reference standard for actual food intake was a SEFI® score determined by assessing photographs of the consumed meals. The tool's understandability and ease of completion were recorded. The SEFI® tool demonstrates minimal limitations compared to existing food intake assessment tools.

All participants were able to complete the SEFI® tool efficiently. Majority fully understood the tool (75.5%; n=200) and found it easy to complete (78.5%; n=208). A significantly strong positive correlation was found between the SEFI® score allocated by participants and researchers ($r=0.798$; $P<0.001$). Results established a relatively high sensitivity (85%), specificity (81%), positive (79%) and negative predictive value (86%).

SEFI® provides a valid, accurate subjective assessment of food intake and can be performed without training. It's a quick, easy-to-use tool that can be utilised to determine food intake within the hospital settings of South Africa to facilitate the early identification of malnourished participants. Future studies can focus on the use of the SEFI® tool by other health care professionals and the use within the GLIM criteria for early identification of malnutrition.

Abstract 45

Media content analysis on the extent and nature of coverage given to the Competition Commission Covid- 19 block exemption into healthcare

Amina Abdullah[1], Thatohatsi Sefuthi[1], Mapato Ramokgopa[1], Sharon Fonn[2], Lungiswa Nkonki[1]
[1]Department of Global Health, Division of Health Systems and Public Health, Stellenbosch University, Cape Town, South Africa, [2]School of Public Health, University of the Witwatersrand, Johannesburg, South Africa

Biography:
Amina Abdullah, second year MPhil Health Systems and Services candidate. She is on her academic journey of enhancing the health of the South African population through research and advocacy for health care reform and to play a more active role in delivering health care and services in response to the health needs of our communities.
Born and Bred in South Africa.

Response to COVID-19 pandemic required coordinated and intersectoral action. One of the coordinated actions taken by the South African government was on competition policy. In response, the South African Competition Commission on 19th March 2020 published a Covid-19 block exemption for healthcare to promote standardization of practices across the South African health sector and facilitate agreements between the National Department of Health and private sector to ensure adequate service delivery to all South Africans. The Covid-19 block exemption into healthcare was aimed at strengthening the health system's response and consequently improve the public health response to the pandemic.

The media is important for raising and communicating policy issues. Media coverage gives status to issues, influencing the public's opinion of their importance. Given the importance of the media in shaping public discourse and communication, we assessed how much coverage the block exemption for healthcare received in the media and if the coverage included any details of what the exemption means, how it can be used, and how it may have influenced public sentiment.

We conducted a qualitative content analysis. Our search yielded 8877 hits over a period of 1 year (19 March 2020 – 19 March 2021), of which 22 met the inclusion criteria. Findings suggests that the block exemption was indeed communicated through varying media platforms which resulted in a reach of 432 003 of the public. Most publications convey what the exemption means but rarely descriptive of how it can be used, and 20 of the included articles received a positive sentiment from the public.

To the best of our knowledge, this is the first study of its kind to systematically examine media reporting on the relaxation of competition policy to aid universal coverage of the health system response to the COVID-19 pandemic.

Abstract 46

From consumptive chic to dirty disease: societal attitudes to tuberculosis as revealed in the arts and literature

Susan Purchase[1], Peter Donald[1]
[1]*Desmond Tutu TB Centre, Cape Town, South Africa*

Biography:
Dr Susan Purchase is currently a Sub-investigator working for the Desmond Tutu TB Centre, primarily on the TB CHAMP trial. Her research centres around MDR prevention in children. After completing her BSc(Hons) in 1994, she worked in the agrochemical industry for 4 years. Unable to resist the call to clinical medicine, she completed her MBChB (UCT) (2004) and diplomas in Child Health (2007) and HIV Management (2008). Since qualifying she has worked primarily in the field of paediatric TB and HIV, as a clinician, researcher and for the NGO Hope Cape Town.

Background:
Decades of meticulous scientific research has ensured that we know a lot about tuberculosis (TB) – the disease, its diagnosis and how to treat it. But stigma and societal perceptions of TB continue to hamper TB programs. Throughout history the arts have played a key role in capturing and immortalizing societal attitudes to the pervasive issues of the time. Studying tuberculosis, as revealed in the arts, may help us to understand historic and current perceptions of this disease.
Design/Methods:
Various databases were interrogated with the search terms “tuberculosis”, “arts”, “literature” and “humanities” and the abstracts scanned for relevance. The authors also read novels, poems and plays, attended the opera, visited art galleries and watched movies in their search for heartfelt encounters with and descriptions of TB.
Results:
In Shakespeare’s time tuberculosis was a disease of love and desire, cured only by possessing the object of desire. The art and literature of the nineteenth century reveals TB as a fashionable disease, with the ability to endow the sufferer with heightened creativity, beauty and spirituality. Only towards the end of the nineteenth century was the disease associated with poverty and uncleanliness. Modern art and movies indicate that the disease is increasingly understood in a biomedical framework but is still seen as “dirty” and is heavily stigmatised. The arts are now used by activists as a tool to highlight the journeys of TB sufferers, to raise awareness and to educate others.
Conclusions:
Society’s perception and understanding of TB has changed dramatically over time. The arts are a window into the suffering and triumphs of humanity and may be an innovative tool in the hands of activists to help end the stigma associated with this disease.

Abstract 47

Lessons from a systematic tracing process aimed at reducing initial loss to follow-up (ILTFU) among tuberculosis (TB) patients in Cape Town, South Africa

Ms Nosivuyile Vanqa[1], Dr Graeme Hoddinott[1], Dr Muhammad Osman[1,2], Dr Lario Viljoen[1], Dr Sue-Ann Meehan[1]
[1]Desmond Tutu TB Centre, Cape Town, South Africa, [2]University of Greenwich, Park Row, United Kingdom

Biography:
I am a Principal Research Officer at DTTC since 2015. Before joining DTTC I provided health services in tertiary and primary health facilities as a Professional Nurse. I expanded my experience in socio-behavioural science research leading in various studies such as Costing of the PopART study, and the implementation of three LINKEDin sub-studies aimed at health systems strengthening. This included data collection and analysis on patients' experiences on linkage to TB care; systematic-tracing and linkage of ILTFU TB patients; LIKED-UP improving routine TB data to reduce ILTFU and increase HIV testing among TB patients in KZN.

Background and Objectives: Cape Town is a high-burden TB setting in South Africa with a case-notification rate of ~597/100,000 in 2019. Currently, newly diagnosed TB patients must link to a TB treatment facility to be registered in the routine TB notification system. Those that are not linked within 30 days of diagnosis are initial loss to follow-up (ILTFU). We describe lessons learned from a systematic process to link TB patients to care.
Methods: Using the Western Cape Provincial Health Data Centre (PHDC), we monitored linkage to care of TB patients diagnosed in the Khayelitsha sub-district, January-December 2020. We identified all TB patients who remained unlinked after a cascade of interventions (SMS, telephone, referral to community healthcare worker). We systematically checked TB treatment registers at primary health care (PHC) facilities and then traced unlinked patients. We collected data at each stage of the process and used the PHDC to confirm patients who subsequently linked to care.

Results: Overall, 406 TB patients had no evidence of linkage in the PHDC. Verification at PHC facilities found that 153/406 (38%) had linked to care. Of those requiring tracing, 34/253 had no contact details; 112/219(51%) were found of which 55/112(49%) had linked between our verification process and home-visits, 49/112(44%) were referred for care; 5/112(4%) were deceased and 3/112(3%) reported that they had not tested for TB. Almost half 107/219(49%) were not found despite multiple telephone-calls, using a vehicle with GPS, and asking locals to assist in finding addresses. Invalid/incomplete home-addresses and addresses within informal settlements posed significant challenges.

Conclusions: Most patients requiring systematic follow-up had either already linked at a facility or linked prior to our home visit. Data delays may have hindered updates in the PHDC. ILTFU may be over-estimated with consequent sub-optimal use of limited tracing resources if there are data quality challenges.

Abstract 48

The prevalence and associated factors responsible for delayed return to work after the mandatory isolation period post-Covid-19 at Tygerberg Hospital, 2020 a cross-sectional study

Dr Frederick Weinand[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
I am a final year Occupational Medicine Registrar. I am passionate about occupational health, especially ensuring that workers are healthy and safe.

Background
Covid-19 had a negative impact not only on the individuals but also on the organisation. While most employers wish the employee to resume duty just after the employee is out of the isolation that might unfortunately not be the case. Some employees may continue to be unfit even after completing the isolation period.
Aim
To determine the prevalence and associated factors responsible for delayed return to work post-COVID-19 isolation at Tygerberg Hospital.
Methods
A cross-sectional study was conducted by extracting clinical information from the health care worker files of employees who attended Tygerberg Hospital Occupational Health Clinic. Data were collected from patient folders, symptom monitoring forms, compensation forms and the Covid-19 questionnaires completed during the return to work assessments.
Results
A total of 1014 participants were analysed; 43% (436/1014) had delayed return to work post-Covid-19 isolation, 95% CI (39.98-46.07) with the median days of 14.0 (IQR=12- 17). Factors associated with the delayed return in the multivariate analysis included: Being hospitalised (OR 4.58, 95%CI=1.56-13.45; p= 0.006), having ongoing Covid-19 symptoms (OR=1.72, 95%CI=1.05-2.82; p=0.031) the professional nurse (OR 1.38, 95%CI=1.00-1.91; p=0.049) and employees from obstetrics and gynaecology section (OR 1.68, 95%CI=1.06-2.66; p=0.026). Other factors included employees with diabetes (OR 2.02, 95% CI=1.34- 3.06; p= 0.001), hypertension (OR 1.76, 95%CI=1.30-2.38; p=0.020), the symptoms of shortness of breath (OR 2.22, 95%CI=1.69-2.93; p<0.001. Additional factors included employees above 60 years of age, (OR 3.52, 95%CI=1.44-8.57; p= 0.006) and the Covid-19 testing facility attended: public vs private (OR 0.64, 95%CI=0.47-0.88; p=0.004).
Conclusions Various, in some cases several, factors were found to affect employees' return to work post-Covid-19 isolation. A holistic approach, rather than a focus on the pathophysiology of the virus, should be encouraged. Follow up studies on the long-term impact of Covid-19 infection on the employees' health is advised.

Abstract 49

Mental health screening in the context of occupational health surveillance

Charles Van Wijk[1]
[1]*Division of Health Systems and Public Health, Department of Global Health, Faculty of Medicine and Health Sciences, ,*

Biography:
Charles van Wijk is a clinical psychologist, with interests in psychological aspects of hyperbaric environments, and occupational mental health surveillance.

Abstract:

The Occupational Health and Safety Act (85 of 1995, as amended) prescribes the requirement to 1) 'identify and manage health risks and its consequences' in the workplace, and 2) 'monitor the health effects of workplace exposure' on workers' health. A comprehensive understanding of health would position mental health as a core aspect of the human experience.

This paper will present a summary of a series of studies over the past four years that explored mental health screening in the context of occupational health surveillance. This will include:
Firstly, the screening for specific mental health issues in specialised and/or high-risk workplace settings (e.g. emergency medical staff, commercial divers). This was approached through exploring the use of both internet-based and general practice based (i.e. pen-and paper) psychometric surveys.
Secondly, the estimating of the prevalence of common mental disorders in general workplace populations. This was achieved through the use of survey-type psychometric screening, with outcomes confirmed by psychological interview.
Thirdly, the development of a concise workplace-focussed tool for mental health screening within the context of occupational health surveillance. This was done by analysing existing data, which was eventually organised into five aspects of workplace mental health and put together in a concise composite screener of less than 50 items.

The paper will conclude with a brief discussion on positioning mental health within the context of occupational health surveillance.

Theme 4 - Violence, Injuries, Trauma and Rehabilitation / Tema 4 – Geweld, Beserings, Trauma en Rehabilitasie

Abstract 50

The role of oxytocin receptor gene variants in appetitive aggression: A study in a South African population

Miss Catherine Lohrentz[1,2], Dr Patricia Swart[1,3], Dr Jacqueline Womersley[1,3], Jessica Sommer[4], Martina Hinsberger[4], Thomas Elbert[4], Roland Weierstall[4,5], Debbie Kaminer[6], Prof Soraya Seedat[3,4], Prof Sian Hemmings[3,4]

[1]South African Medical Research Council / Stellenbosch University Genomics of Brain Disorders Research Unit, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Division of Molecular Biology and Human Genetics, Department of Biomedical Science, Faculty of Medicine and Health Science, Stellenbosch University, Cape Town, South Africa, [3]Department of Psychiatry, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [4]Department of Psychology, University of Konstanz, Konstanz, Germany, [5]Clinical Psychology & Psychotherapy, Medical School Hamburg, Hamburg, Germany, [6]Department of Psychology, University of Cape Town, Cape Town, South Africa

Biography:

Catherine Lohrentz is a MSc Human Genetics candidate within the Division of Molecular Biology and Human Genetics, at Stellenbosch University. She is a member of the Neuropsychiatric Genetics research group, where her current research investigates virtual reality as a tool for physiological bio-marker exploration in post-traumatic stress disorder in a South African population, with a focus on FKBP5 methylation.

Exposure to childhood trauma can negatively impact psychological development and promote the development of aggressive behaviour. Appetitive aggression, a sub-category of instrumental aggression, is characterised by the enjoyment of participating in violent behaviour towards others. Oxytocin has been suggested to play a role in the aetiology of aggressive behaviour. Research has shown that variants in the oxytocin receptor (OXTR) gene are associated with aggressive behaviour. Whilst studies have investigated the role of OXTR variation in aggressive behaviour, no studies have investigated the interactions between OXTR genotypes and childhood trauma, and their role in appetitive aggression. The aim of the current study was to explore interactions between genotypic variants in OXTR SNPs rs2254298 and rs53576 and childhood trauma exposure on appetitive aggression in a high-risk cohort of adult Xhosa males.

This research is an extension of a study conducted by Hinsberger et al. which investigated attraction to violence in the context of continuous trauma exposure. The investigation found that appetitive aggression scores were predicted by experienced and witnessed traumatic events. The sample group comprised of 250 adult male Xhosa participants, recruited from the townships of Khayelitsha and Gugulethu in South Africa. OXTR variants were determined using a PCR and restriction enzyme digest genotyping approach and were investigated for their association with levels of appetitive aggression (measured by the Appetitive Aggression Scale (AAS)) using a Poisson regression analysis.

OXTR rs2254298 G/G and A/G genotypes were found to be significantly associated with lower AAS scores ($p<0.001$) compared to participants with the A/A genotype. There were no significant associations between OXTR rs53576 genotypes and AAS scores. This study should be considered in light of several limitations, however it is one of the first to suggest that OXTR rs2254298 genotypes may be associated with appetitive aggression, providing insight into the genetic aetiology of appetitive aggression.

Abstract 51

Early outcomes of surgically managed civilian gunshot femur fractures at a level one trauma unit in Cape Town, South Africa: A retrospective review

Obakeng Makhubalo[1], Prof Nando Ferreira, Dr Marilize Burger, Dr Shafique Jakoet
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Dr Obakeng Makhubalo - 2nd year Orthopaedic Registrar at Stellenbosch University. Graduated with an MBChB degree from University of Cape Town (2013).

Purpose: To assess the outcome of surgically fixated femur shaft and distal femur fractures following low-velocity civilian gunshot injuries over a 4-year period..
Methods: A retrospective review was conducted on all patients who sustained femur shaft and distal femur fractures from civilian low-velocity gunshot injuries that required definitive surgical fixation between January 2014 and December 2017. Patient demographics, comorbidities, injury characteristics, duration between injury and surgical fixation, and presence of complications were captured. Data were described using appropriate summary statistics, and associations were investigated using chi-square statistical tests using an alpha-level of 0.05.
Results:A total of 122 patients (mean age, 29.1 ± 9.5 years) were included. Supracondylar femur fractures (AO 33) accounted for 49% of total injuries, followed by femoral shaft (AO 32) and intraarticular distal femur fractures (AO 33 B & C) with 40% and 11% respectively. Intramedullary nail fixation was the choice of treatment for femur shaft fractures (49,98%) and supracondylar fractures (63%). Intra-articular injuries were predominantly treated with distal femoral locking plates (85%). Arterial and nerve injuries were the most commonly encountered associated injuries occurring in five patients (4.1%) each. Fracture related infection was diagnosed in two patients (1.6%). No cases of non-union and compartment syndrome were recorded. Fracture fixation with plate and cannulated screws were associated with more complications than intramedullary nailing ($p = 0.003$).

Conclusion:This study demonstrated that femur shaft and supracondylar fractures fixated with intramedullary nails are associated with low complication rates. Intra-articular distal femur fractures fixated with locking plates and cannulated screws have a high complication rate and poorer surgical outcomes. This study also suggests that non-union and compartment syndrome are rare complications of gunshot femur fractures fixated with either intramedullary nails or locking plates. Future studies assessing the functional outcome of patients with these injuries are warranted.

Abstract 52

Available Dysphagia Assessment Protocols for Populations with Paediatric Traumatic Brain Injury: A Scoping Review

Mr Gert Koekemoer[1], Ms Bahale Mehale[1], Ms Carla Wolf[1], Ms Leana Pietersen[1], Ms Verne' Mc kok[1], Ms Amelia May[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Feeding is more than what meets the eye. Adding to quality of life, nutrition and social closeness, children benefit from the advantages that feeding holds. With keen interest in both feeding and neuroscience, this group of speech - therapy students, embarked on the journey to discover more about the holistic assessment of both feeding and brain injury in the paediatric population. With group members from across the country , diverse perspectives have created a unique body of research with South Africa in mind.

Background: Traumatic brain injury (TBI) is a non-degenerative injury following blunt force trauma or penetrating injury to the head, resulting in disrupted brain functions. Disruptions in typical brain functioning may manifest in impairments, notably in feeding and swallowing i.e. dysphagia. Dysphagia is present in 10-15% of children with moderate TBI, and 68-76% in children with severe TBI. The high incidence rate of dysphagia among PTBI patients highlights the need for a comprehensive assessment protocol to meet the urgent and specific needs of the paediatric population. Rationale: This scoping review explores and describes the available dysphagia assessment protocols for 2–6-year-old children with moderate to severe PTBI. The methodology was utilized to determine the available assessments and identify any research gaps within the field of dysphagia in PTBI patients in order to inform quality patient management. Information was retrieved from a total of 26 articles (n=26) that complied with the set criteria was used for the charting, analysis, and discussion of the data. Results: No set dysphagia assessment protocols were identified for the PTBI population. Non-instrumental assessment procedures were typically utilized by speech-language therapists (SLT) as screening and diagnostic tools for PTBI patients. Most articles confirmed the use of instrumental assessment procedures, such as the VFSS and FEES, by a multidisciplinary team (MDT) in acute healthcare contexts. Limited contribution from middle to low-income countries such as South Africa was noted, where the lack of research and standardization of operational procedures are prevalent. Conclusion: The efficacy of dysphagia assessment procedures depends on the clinician's skill and their access to resources, which is not always feasible in middle-to-low countries such as South Africa. As a result, the development of a set dysphagia assessment protocol remains a priority in dysphagia care for PTBI patients.

Abstract 53

Effectiveness Of Quadriceps Muscle Strengthening On Active Terminal Knee Extension Deficit Following Femoral Fracture: A Case Study And Literature Review

Tasha Ainsworth[1]
[1]*Rehabilitation Science, Cape Town, South Africa*

Biography:
BSc Physiotherapy IV student

Introduction: Muscle weakness after a femoral fracture often results in the inability to perform active knee extension. An active terminal knee extension deficit (TKED) contributes to functional deficits. Effective interventions to reduce active TKED can help mitigate its effect on individuals and healthcare system outcomes.

Aim: To investigate the effectiveness of quadriceps muscle strengthening on muscle strength, active knee extension range of motion (ROM), pain, and function in adults following a femoral fracture.

Methods: A case study of an adult presenting with an active TKED following a femoral fracture and a rapid literature review was used. A 3-day intervention, comprising isometric, eccentric and concentric quadriceps contractions was performed. Outcomes of interest included: quadriceps muscle strength; active knee ROM; pain intensity; and self-reported functional ability. Studies for review were identified from electronic databases. The inclusion criteria were adults presenting with an active TKED following femoral fracture; quadriceps strengthening intervention; and studies investigating the outcomes of interest. The methodological quality of the eligible studies were appraised using the Physiotherapy Evidence Database (PEDro) Scale. Data pertaining to context, intervention and effect were extracted and compared.

Results: The case presented an adult male with an active TKED of 15° following femoral fracture-related sepsis. Knee extension ROM, pain, and function improved after the intervention. However, muscle strength remained unchanged. Three randomised controlled trials, with an average PEDro score of 7/10 were included. All studies found a significant improvement in muscle strength post-intervention, whilst one found a significant improvement in pain, and another in function. Intervention timeframe influenced the outcomes.

Conclusion: This research report provides preliminary evidence supporting the effectiveness of quadriceps muscle strengthening on muscle strength, pain, and function in adults following a femoral fracture. This intervention is feasible for improving patient-specific outcomes. Further research is recommended on ROM and longer intervention duration.

Abstract 54

Facilitators and Barriers of Telerehabilitation at the Bishop Lavis Rehabilitation Centre: a Stakeholder Perspective

Ms Minell De Villiers[1], Ms Tarryn Exford[1], Ms Nuraan Ismail[1], Ms Emma Lakey[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Minell de Villers and Tarryn Exford are final year occupational therapy students from Stellenbosch University. They completed the research study with two of their peers.

Minell is hardworking with good problem solving skills, responsibility, professionalism and a passion to make society a better living environment.

Tarryn has good interpersonal and communication skills, she is creative, innovative, assertive and adaptable, with good organizational skills.

Background: Telerehabilitation as a form of service provision has increased across many of the heath care professions, especially after the outbreak of the COVID-19 pandemic in 2020. Given the scarcity of research on telerehabilitation in low socioeconomic contexts, this research study considered the barriers and facilitators of telerehabilitation from a stakeholder perspective at Bishop Lavis Rehabilitation Center (BLRC), situated in a low-income community in the Western Cape.

Aim: To gain insight on the accessibility, contextual relevance and responsiveness of telerehabilitation and provide recommendations for the improvement of telerehabilitation for future service users.

Methods: A qualitative, collective case study design was followed. Purposive sampling was used to recruit participants, namely 2 occupational therapists running the telerehabilitation program at BLRC, 5 fourth-year occupational therapy students of 2021 that facilitated the telerehabilitation sessions, 3 patients who received telerehabilitation and 5 home-based carers who received training via telerehabilitation. Data collection was conducted by individual and focus group interviews. Coding was done with ATLAS.ti and Thematic Analysis was used to identify themes.

Results: Three themes emerged: (1) Elements that aid or increase responsiveness and relevancy of telerehabilitation (Facilitators), (2) Elements that hinder the responsiveness and relevancy of telerehabilitation (Barriers) and (3) Suggestions for improvement of telerehabilitation.

Conclusion: Telerehabilitation has great benefits with regards to reduced time and money consumption in terms of transport mobility and access to therapy. Though it is clear that telerehabilitation can be successful and does hold many advantages, the feasibility and effectiveness of the service in a low-recourse setting is however questioned in terms of the practicality and the carryover of information from service provider to the service user in a meaningful way. Although there is still a great preference for face-to-face therapy from all the stakeholders, there is definitely an opportunity for telerehabilitation to grow in use within occupational therapy.

Abstract 55

Injury pattern, management and outcomes of gunshot-related fractures to the hand and wrist at a tertiary level trauma center.

Mr William Howard[1], Prof Nando Ferreira[2], Dr Marilize Burger[3], Dr Hentas Van Zyl[4]
[1]Stellenbosch University, Tygerberg, Cape Town, South Africa, [2]Division of Orthopaedic Surgery , Tygerberg, Cape Town, South Africa, [3]Division of Orthopaedic Surgery , Tygerberg, Cape Town, South Africa, [4]Division of Orthopaedic Surgery , Tygerberg, Cape Town, South Africa

Biography:
William Thomas Howard is a final year medical student with a special interest in Orthopedic trauma and hand trauma.

Background: Civilian gunshot-related hand and wrist injuries are largely underreported in the literature, especially in South Africa. This type of injury can carry significant financial, social, and quality of life implications. This study aimed to describe the injury pattern, management, complications, and treatment outcomes of patients with gunshot-related injuries to the hand and wrist. A secondary objective was to identify possible risk factors for patients lost to follow-up.

Method: This retrospective descriptive study included all patients who sustained a gunshot-related injury to the hand and wrist, managed at a tertiary level hospital between 2013 and 2017. Patient demographics, injury-related information, definitive management, management outcomes, and functional ability at the final follow-up visit were recorded. Associations between risk factors and loss to follow up were investigated.

Results: A total of 144 patients (92% male) were included in the study (mean age 29±9 years, range 10 – 62). Most injuries were sustained to the metacarpals (43.1%) and phalanges (40.9%). The most used definitive management was conservative (45.1%), followed by ORIF with Kirschner-wires (31.3%). The outcomes noted in the study were non-union (4.2%), joint contracture (22.2%), sepsis (1.4%) and range of motion loss (39.6%). 51.4% of patients were lost to follow-up, with significant associations observed between injury site (P=0.037), and type of definitive treatment (P=0.042) and the likelihood of being lost to follow-up.

Conclusion: Gunshot-related injuries to the hand and wrist predominantly affected male patients, which is in agreement with the literature. There was no clear, distinct injury pattern with a wide variation of reported injuries. Low complication rates were noted, with the highest being loss of range of motion. Lost to follow-up rates were expectedly high with two interesting associations: the injury site and the type of definitive treatment. Future research should interrogate these findings in more detail.

Abstract 56

The immediate effect of Progressive Muscle Relaxation on the pain and mental well-being of garment workers.

Ms Zita Catherine Clair Jacobs, Ms Sanda Dwayi, Ms Yonela Sokomani, Ms Domonique Prince, Ms Aqeelah Ganie, Mrs Munira Hoosain, Ms Sonya Marais
[1]*Stellenbosch University, Cape-town, South Africa*

Biography:
We are a group of five, fourth-year occupational therapy undergraduate students completing our degrees at Stellenbosch University. We have been hard at work, completing our research thesis, and have recently presented our thesis presentation at the fourth year B OT undergraduate research presentation day. We are extremely proud of our work and look forward to presenting our thesis at the FMHS Academic day.

Background:
Musculoskeletal pain is prevalent amongst garment workers as a result of awkward postures, as well as repetitive or forceful movements. Musculoskeletal pain can have a negative impact on the mental health and quality of life of workers, subsequently leading to a decrease in productivity. Progressive Muscle Relaxation is a time-efficient, cost-effective and simple technique that could be used by workers while at their workstations. The aim of this study is to determine the immediate effect of PMR on the pain and mental well-being of garment workers with musculoskeletal pain.

Methods:
A pre-experimental, single-group pretest-posttest design was used. Data were collected in two sessions with the workers, individually (n=24). During the first session, consent was obtained, an intake interview was done to determine eligibility for the study, and the Patient Health Questionnaire-9 was administered. During the second session, the pain Visual Analogue Scale and Stellenbosch Mood Scale were administered before and immediately after the PMR intervention. Data were recorded and tracked on spreadsheets and analyzed using SPSS.

Results:
24 workers participated, with a mean age of 40,67 years and the average length of employment of 10.26 years. PHQ-9 scores showed that most (n=9) participants presented with minimal depression, followed by (n=15) participants presenting with mild, moderate, and moderately severe depression. Pain VAS scores indicated that PMR effectively decreased musculoskeletal pain with a mean difference of 2.67 ($p < .001$, effect size 1.74). Results from the STEMS showed an improvement in mood after the PMR intervention (effect sizes >0.5).

Conclusion:
PMR was effective at immediately reducing musculoskeletal pain and improving the mood of garment workers with musculoskeletal pain. We recommend further research using a control group and assessing long-term effects of PMR.

Abstract 57

Functional response of a patient with hemiplegia to trunk rehabilitation: a case study and literature review

Miss Sarah-Jane Klopstra, Miss Jessica Mol, Miss Candice van Vuuren, Miss Hannah Haswell

Biography:
BSc Physiotherapy IV Students, Stellenbosch University

Introduction
Cerebrovascular accidents (CVA) contribute to a high burden of disease in South Africa, affecting independence and participation of many in society. Trunk rehabilitation can improve functional outcomes and reduce disability post-stroke.

Aim
The aim of this case report and literature review was to investigate the effect of a trunk rehabilitation programme on function in a middle-aged female patient with hemiplegia, and to compare the case study findings to published evidence.

Methods
A case study was conducted in August 2021 and reported using the TIDieR framework. The Patient Specific Functional Scale and the Timed Up and Go test were used to assess function and mobility. A systematic search of literature which implemented upper- and lower-trunk flexion-rotation exercises to improve function and mobility in adult chronic hemiplegic patients, was conducted in May 2022. Methodological quality of the literature was critically appraised. The study description, PROGRESS-PLUS elements, TIDieR framework, outcome measures and intervention effect were compared to the case study using the PATIENT-FIT framework.

Results
The case study presented a 50-year-old female with right-sided hemiplegia after sustaining a left CVA in June 2018. The participant received rehabilitation post-CVA and was able to mobilise independently, however, due to the COVID-19 pandemic, rehabilitation was discontinued. Upon evaluation, the participant presented with poor trunk control, increased tone globally on the right side, poor upper limb function and decreased mobility. Management included a trunk-specific rehabilitation programme and primary caregiver education to administer the home exercise programme. Following the intervention, the participant demonstrated improvement in mobility and perceived difficulty in functional upper limb activities.

Conclusion
This case study suggests that selective trunk rehabilitation can improve upper- and lower limb function and mobility in patients with stroke, despite the chronicity timeline of recovery. The literature review findings confirmed the positive effects found in the case study.

Abstract 58

Management and outcomes of gunshot induced forearm fractures

Dr Douglas Bruce-brand[1], Prof Nando Ferreira, Dr Marilize Burger
[1]*Stellenbosch university , Cape Town, South Africa*

Biography:
Registrar in orthopaedics, presentation of MMed

Background: This study aimed to assess the burden, management and outcomes of gunshot-induced extra-articular forearm fractures at a tertiary institution in the Western Cape.
Methods: Patients who presented with extra-articular gunshot-induced forearm fractures between January 2014 and December 2017 were included. Injuries were classified and categorized using the AO classification system. Patient demographics, injury variables, management information, the timing of events and treatment outcome information was collected. Fracture union was assessed on serial x-rays. Data was reported using summary statistics.
Results: Ninety-six patients (93.8% male, mean age 29±10.6) were included with 45 radius, 36 ulna and 15 both bone fractures. A total of 51 patients (53.1%) were treated operatively, with an average time to surgery of 5.5 days. Fractures treated non-operatively united 2 weeks earlier than those treated operatively, 12 versus 9.8 weeks for radius fractures and 10 versus 8 weeks for ulna fractures Associated injuries were identified in 53(55.2%) patients and included 36 (37.5%) patients who sustained more than one gunshot injury, 24 (25%) patients who had associated nerve injuries and four (4%) patients who sustained arterial injuries. One patient presented with a fracture-related infection. Of the patients who followed up beyond 12 weeks (n=53, 55.2%), union occurred in 92.5% (n=49 of 53). Isolated radius fractures were malunited in a shortened position in 29.2% (n=12 of 41) patients.
Conclusion. An important finding was the large proportion of patients lost to follow-up, resulting in only a subset of patients for whom outcomes could be reported. A second finding was that forearm fractures can be treated conservatively or operatively with similar times to union. Special care needs to be taken when managing isolated radius fractures as shortening is a common complication. Finally, there is a low burden of infection with GSW-induced fractures when treated conservatively or with single-stage surgery.

Theme 5 – Perioperative Sciences / Tema 5 – Perioperatiewe Wetenskappe

Abstract 59

Dead space management strategies in the treatment of chronic osteomyelitis

Dr Gadi Epstein[1], Prof Nando Ferreira
[1]*Tygerberg Hospital, Cape Town, South Africa*

Biography:
MBChB (University of Pretoria)
FCOrtho(SA), MMed (Stellenbosch University)

Background
Dead space management is an integral part of the treatment of chronic osteomyelitis. Failure to address dead space after surgery may lead to recurrence of infection. Several strategies have been employed to manage dead space including cement spacers, collagen fleece, irrigation systems, synthetic bone substitutes, and bioactive glass. Currently there is no gold standard strategy for dead space management and the assignment of the most appropriate strategy to patients is challenging.

Methods
We performed a retrospective review (Jan 2016 – Feb 2022) on the outcomes of the dead space management strategies performed at a tertiary level reconstruction unit. All patients treated for chronic osteomyelitis with a minimum follow up of 6 months were included in the study. Dead space management strategies were implemented as per a comprehensive integrated approach. Data was collected with regards to patient demographics, dead space strategy employed, and outcome in terms of resolution of infection.

Results
A Total of 174 patients were included in the study. Cause of infection included AHO(16%), FRI (82%), and PJI (2%). Resolution of infection was achieved in 92% of patients. A total recurrence rate of 6.3% was noted. The recurrence rate per strategy was 2% for the Lautenbach group, 4% for the Bioactive glass group, 4% for the Ceramant group, 0% for the Osteoset bead group, and 12% for the cement spacer group. Failure rates were highest for groups that required segmental bone resection. Outcomes were in keeping with international reports.

Conclusion
Dead space management strategies are an integral part of the management of chronic osteomyelitis. We noted a 92% success rate in the treatment of chronic osteomyelitis when using a comprehensive integrated approach, however recurrence rates are higher in patients requiring segmental bone resections. Careful patient selection and judicious dead space strategies are vital in achieving resolution of infection.

Abstract 60

Posterior Malleolus Ankle Fractures: Investigating the fracture patterns and the management decisions of posterior malleolus ankle fractures in the South African population

Dr Edward Fuzy[1], Dr Danie Hugo[1], Dr Craig Brown[1], Prof Nando Ferreira[1], Dr Marilize Burger[1], Dr Etienne Joubert[1]

[1]*Division of Orthopaedics, Stellenbosch University, Cape Town, South Africa*

Biography:

Registrar of Orthopaedics

Background: Trimalleolar fractures constitute a significant proportion of ankle fractures with poor functional outcomes. Paramount to improving outcomes is correctly identifying and managing these complex fracture patterns. This research aimed to understand the prevalence, morphology, and surgical management of these injuries in the South African setting to determine if there were any significant differences from that of international literature. Additionally, radiological diagnostic accuracy among the authors was evaluated to establish potential diagnostic difficulties with the current classification systems.

Methods: This multicenter retrospective analysis reviewed all participants who had Computed Tomography scans for injuries to the foot and ankle. All scans with posterior malleolus fractures were included for review; Pathoanatomical data was collected and stratified according to established classifications and the definitive surgical management evaluated. Authors individually reviewed the radiographic data and their findings collated.

Results: In 71 cases reviewed, the average age was 41 years, with a female predominance of 69% and 73.2% left sided injuries. High energy injuries accounted for 23.9% of fractures and 50.7% having concomitant co-morbidities. Although the injuries could be stratified according to established classifications, the interrater reliability of correct radiological diagnosis was found to be poor (43%-54%). No consistent treatment pattern could be identified, with variations in both operative and non-operative strategies.

Conclusion: In contrast to international literature, this research identified a different patient population of younger individuals with higher energy mechanisms of injury and found to be managed with greater variability in the local context compared to proposed treatment algorithms in international studies. Complexities of current classifications, resource limitations and poorly defined treatment algorithms impacted their management.

Implications for practice: International literature and subsequent management algorithms for trimalleolar fractures have altered treatment in recent years. However, they need to be scrutinized further and contextualized to the local population in our settings.

Abstract 61

The spectrum of disease and short-term outcomes of obstetric patients with cardiac disease at a tertiary hospital in South Africa

Dr Nicole Greeff[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
I am a senior registrar at Stellenbosch University Department of Anaesthesiology and Critical Care
I completed my MBChB degree in 2012 at Stellenbosch University. I obtained my Diploma in Anaesthesiology, DA (SA), in 2015 during my community service at Kimberley Hospital complex, and my Diploma in Obstetrics, DipObst (SA), in 2016. I worked as a Medical Officer in Anaesthesiology and Critical Care at Kimberley hospital and Karl Bremer Hospital. I started my registrar time on 1 October 2019 at Tygerberg Hospital.

Background: Cardiac disease in pregnancy is a major contributor to indirect causes of maternal mortality, although the disease spectrum differ between high- and mid-to-low income countries. Our study aims to assess the spectrum of cardiac disease and short-term outcomes in obstetric patients at a tertiary hospital in a mid-income country, including assessment of echocardiograms and applying risk-scoring systems.
Methods: A single-centre, retrospective, descriptive, cross-sectional study, consisting of all the obstetric patients with cardiac disease admitted between January 2018 and December 2019 to the Tygerberg Hospital Obstetric Critical Care Unit (n = 86). Cardiac complications secondary to pre-eclampsia were excluded.
Results: Three main groups were identified: valvular heart diseases (50%), cardiomyopathy (22%), and congenital heart diseases (22%). The majority (92%) of major and secondary cardiac outcomes were associated with cardiomyopathy and valvular disease. The presence of echo high-risk parameters was dependent on the cardiac class: cardiomyopathy and valvular disease had a higher association. Cardiac interventions were performed in 30 (34.8%) patients before pregnancy, 17 for valvular and 13 for congenital diseases, with only 3 interventions during pregnancy and no interventions postpartum. Peri-partum ICU interventions (ventilation and haemodynamic support) were required by patients with cardiomyopathy (n=12) and valvular disease (n=11). The assumption that patients with these interventions would have a longer ICU stay is validated (ventilation, $p=0.027$; inotropic support, $p<0.001$). A significant correlation between gestation at first presentation and requiring ICU intervention was found.
Conclusion: Major and secondary cardiac outcomes were associated with cardiomyopathy and valvular disease in our cohort. Late presentation for first assessment is associated with more adverse short-term outcomes, an increased need for ICU interventions and longer ICU stay. Risk-scoring tools show an association with ICU interventions and stay.

Abstract 62

Utilisation of the post anaesthetic high care unit at Tygerberg hospital: a retrospective audit

Dr Leani Harmse[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Registrar in the department Anaesthesia and Critical care at Tygerberg Hospital. Studied undergraduate degree at the University of Pretoria and completed internship and community service in Bloemfontein and Klerksdorp respectively.
I completed my DA(SA) in 2013 and DipPEC in 2015 and worked as a ship's doctor for 3 years prior to starting my specialization in 2019.

L Harmse, N Ahmed, C Cilliers

Background: Our post-anaesthesia high care unit (PAHCU) is a transient care unit that provides continuous monitored care by trained staff, ideally for less than 24 hours to patients identified pre-operatively as having an elevated risk for postoperative complications. This unit can provide level 1 and 2 care to patients that need support to maintain hemodynamic stability and other vital functions. This study aimed to describe the patient population, utilization and efficiency of this unit, and investigate correlation between patient comorbidities, surgery type and risk for exceeding a 24 hour stay
Methods: This is a retrospective descriptive audit. 1020 patients' data was captured between 01 January 2019 to 31 December 2020. All patients admitted were included. The primary outcome was to assess the utilization and efficiency of the unit. Secondary outcomes were to assess the indication for admission, modes of analgesia used and describe length of stay.
Results: Bed occupancy was 86.8% during week days in 2019 and 58.13% in 2020. 889 (87.2%) were pre-planned admissions and 130 (12.75%) unplanned. 69 (6.75%) patients exceeded a 24 hour stay. 1 patient demised. 11 patients were transferred to ICU. Correlation between risk of exceedance of 24-hour stay was found with patients older than 61 years or younger than 40 (p=0.003), aortic stenosis (p=0.006), patients admitted from general surgery (p=0.036), patients admitted for hemodynamic monitoring (p=0.001) and patients admitted for epidural care (p=0.035).
Conclusions: Our PAHCU utilization seems appropriate as only 6.75% of patients exceeded a 24 hour stay and 11 patients required transfer to ICU. With a bed occupancy of 86.8% in 2019, the unit can be considered efficient. The COVID pandemic is a possible cause for the decreased bed occupancy in 2020.

Abstract 63

SURGICAL OUTCOME OF INFECTIVE ENDOCARDITIS AT TYGERBERG HOSPITAL FROM 2010-2019: A RETROSPECTIVE REVIEW

Dr Riaan Nel[1,2], Prof Jacques Janson[1,2]
[1]Tygerberg Hospital, Parow Valley, South Africa, [2]Stellenbosch University, Parow Valley, South Africa

Biography:
Pre-graduate MBChB completed at the University of Pretoria (2011). I am currently enrolled as a final year registrar in the Division of Cardiothoracic Surgery at Stellenbosch University and Tygerberg Hospital, with the expected completion of my MMed (Thor) and FC Cardio in 2023. At present I am employed full time at Tygerberg hospital while completing my training as Cardiothoracic Surgeon. As an avid musician and father of two beautiful daughters, I generally enjoys spending time in the bushveld when the studies allow.

Background: A thesis presented on the operative outcome of patients undergoing left sided cardiac valve surgery for infective endocarditis, within the setting of Tygerberg Hospital during 2010 to 2019.
Objectives: It is hypothesized that differences in burden of disease, timing to surgery, organism prevalence and co-morbid disease distribution may show a poorer outcome compared to internationally expected standards.
Method: The study was a retrospective research project to evaluate the outcome of heart valve surgery with confirmed or suspected infective endocarditis. The final cohort (n=160) was assessed looking at various demographic, operative and admission related parameters. The primary outcome is to measure the early (<30day) mortality, mortality after 30days, and the long-term survival.
Results: During the follow-up period 77.5% (n=124) of the cohort were still alive, 8.8% (n=14) demised within 30 days, and 13.1% (n=21) demised more than 30days after surgery. In the early post operative period a higher mortality was observed with increased age ($p=0.04$), critical illness ($p<0.001$) and a higher urgency of intervention ($p<0.001$). The EuroScore II scoring system was an important predictor of early post-operative mortality ($p<0.001$), but the accuracy thereof waned significantly after 30days. A strong association with peri-operative organ failure could also be demonstrated as a risk factor, with cardiac failure ($p=0.025$), acute renal failure ($p=0.016$) and respiratory failure ($p<0.001$) contributing significantly to both early and late mortality.
Conclusion: Infective endocarditis remains a major burden in South Africa and is a common indication for cardiac valve surgery. The outcome of these patients depends on a multitude of factors. The high rate of culture negative infective endocarditis within the patient group requiring surgery, makes organism directed antibiotic stewardship incredibly difficult. Goal directed medical management and clinical optimization prior to surgical intervention were shown to be the most important adaptable factors attributing to better surgical outcome.

Abstract 64

A quality improvement study of the information pertaining to anticipated post-operative course in mastectomy patients

Miss Leah Nell[1], Dr Wilhelmina Conradie[1,2], Dr Patsy Oosthuizen[1], Dr Ingrid Hartmann[1], Dr Lindi Martin[1], Dr Peggy Msomi[1], Dr Sumare Prinsloo[1], Dr Rizwana Roomaney[3], Miss Salomien Oosthuizen[1], Miss Astrid Bothman[1], Miss Sibongumzuzu Mkhwanazi[1], Dr Jenny Edge[1,2]

[1]Division of Surgery, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Breast and Endocrine Unit, Division of Surgery, Tygerberg Academic Hospital, Cape Town, Cape Town, South Africa, [3]Department of Psychology, Stellenbosch University, Cape Town, South Africa

Biography:
I am a fifth year medical student at Stellenbosch University, Faculty of Medicine and Health Sciences.

Study aims: to evaluate patients' knowledge of the information sheet content provided prior to mastectomy, and to assess post-operatively whether patients felt they were adequately prepared for their surgery and informed about post-operative complications.

The study is a student-led prospective mixed-method study including quantitative and qualitative data. Females over 18 years undergoing a mastectomy for breast cancer at Tygerberg Hospital from March 2022 are invited to participate. Patients excluded from the study are those receiving tumour excision, those receiving immediate reconstruction, patients with communication barriers or those unable to give consent independently. Quantitative data analysis was performed using SPSS Statistics for Windows. Qualitative data will be analysed using ATLAS.ti. The quantitative data from patients 1-25 form the basis for this abstract. Ethics approval reference: N21/02/012.

Average age of patients = 52. Language distribution: Afrikaans=14, isiXhosa=6, English=5. Stage distribution: stage 2=10, stage 3=7, stage 1=5, stage 4=1. Risk-reducing mastectomies=1. Pre-operative neoadjuvant chemotherapy=13.

Preliminary results indicate that most patients recall receiving the information sheet and almost all said they had read it. Almost all patients knew when their operation was due to be performed. However, only 17 were able to list any possible side effects. The majority knew at least one doctor in their team but only 4 were aware of the nursing staff. Level of education, first language and employment status does not seem to significantly influence patients' pre-operative questionnaire responses.

These preliminary results on a small cohort of patients show that most patients do read information sheets prior to their operation. In addition, patients highlighted the appreciation and need for support from families and medical staff, and felt that they should be well informed of possible complications. Results from the full study will give more information about how we can improve the experience of having surgery at our hospital.

Abstract 65

EFFECT OF A CARBOHYDRATE LOLLIPOP ON THE GASTRIC VOLUME OF FASTED PEDIATRIC PATIENTS

Dr Pieter Odendaal[1], Dr Annemie Burke, Prof Johan Coetzee
[1]*Department of Anesthesiology and Critical Care, University of Stellenbosch, Parow, South Africa*

Biography:
Registrar in Anaesthesiology and Critical Care at Stellenbosch University.

Background:
Preoperative fasting is part of routine practice. Children subjected to prolonged preoperative fasting often suffer adverse effects. Consuming a preoperative lollipop may lessen their anxiety and have clinical benefits.

Aims:
To assess the effect of consuming a lollipop on gastric volume and the feasibility of administering a lollipop to a child preoperatively.

Methods:
In this prospective, repeated measures interventional study, we measured gastric antrum volume using ultrasound in children aged 2-18 years. We measured antrum volumes after participants had fasted for a minimum of six hours for solids and two hours for clear fluids. They then consumed a standard carbohydrate lollipop, and we repeated the antrum volume measurements after one hour.

Results:
Of the 38 patients enrolled, 32 completed the study; four had ingested additional food or liquid, and two were diagnosed with systemic disease the day after data collection. The gastric volume data were normally distributed. The mean volume change was 0.01 ml.kg-1 (95% CI -0.02 to 0.05; p = 0.460). The mean post-lollipop volume was 0.51 ml/kg (95% CI 0.43 to 0.58).

Conclusions:
Consuming a standard lollipop did not affect the gastric volume of fasted pediatric patients.

Abstract 66

Investigating a Low-Cost, Nasopharyngeal Apnoeic Oxygenation Technique in a Morbidly Obese Population: A Randomised Controlled Study

Dr Scott Pierpoint[1], Dr Jonathon Burke[1]
[1]*Stellenbosch University and Tygerberg Hospital, Cape Town, South Africa*

Biography:
I am a 4th year Registrar in the Department of Anesthetics and Critical Care. I have completed my part 2 exams and currently completing my training time. This research is my MMed submission. I have an interest in vascular, trauma, airway management and anaesthesia in obese patients.

Background
Obese patients pose anatomical and physiological challenges that may cause rapid desaturation during airway management. Apnoeic oxygenation techniques assist in preventing hypoxia by prolonging safe apnoea time. This study investigated a low-cost, nasopharyngeal apnoeic oxygenation technique, with the aim to establish its efficacy, safety limits and prove its superiority over preoxygenation-alone in an obese population.

Methods
A randomised controlled study was conducted on obese (BMI≥35kg/m²) patients presenting for elective surgery. Patients were allocated by block randomisation to a preoxygenation-only (NoAO) and an intervention (NICA-O_2) group. All patients received preoxygenation, followed by a standardised induction. The intervention group received oxygen at 18l/min via the nasopharyngeal catheter intervention during the apnoea period. The desaturation process was documented until an SpO_2 of 92% was reached, or 600s (10 minutes) elapsed, which was defined as the primary outcome of the study (safe apnoea time). Secondary outcomes were rate of carbon dioxide accumalation and factors affecting the risk of desaturation.

Results
Thirty patients (NoAO=10; NICA-O_2=20) were studied in a morbidly obese population (NoAO=41,1kg/m²; NICA-O_2=42,5kg/m²). The median safe apnoea time was significantly longer (NoAO=262s [IQR 190-316]; NICA-O_2=600s [IQR 600-600]) (Mann-Whitney-U test, $p<0.001$), and the risk of desaturation significantly lower (HR=0,072, 95%CI[0,019–0,283]; Log-Rank test, $p<0.001$) in the intervention group. All 10 patients in the preoygenation-only, and 3 in the intervention group, desaturated to 92% within 600s. The mean rate of carbon dioxide accumalation was significantly slower in the intervention group (NoAO = 0,47±0,14kPa/min; NICA-O_2 = 0,3±0,09kPa/min) (t-test, $p=0.003$). There were no statistically significant risk factors associated with an increased risk of desaturation found.

Conclusions
This is an inexpensive, practical method that improves airway management safety and reduces the risk of desaturation in morbidly obese patients. It provides apnoeic oxygenation that is comparable to high-flow nasal oxygen, and is an effective, low-cost alternative for resource-constrained environments.

Abstract 67

Petroleum Jelly as an Alternative Coupling Medium in Focus Assessed Transthoracic Echocardiography (FATE)

Dr Charl Smit[1]

[1]*Stellenbosch University, 22 Vergezicht Complex, Loevenstein, South Africa*

Biography:

My name is Charl Pierre Smit. I am currently in my final year of registrar training in the dept of Anaesthesiology and Critical Care. I am a member of SASA, HITSA and an international affiliate with the Royal College of Anaesthesiologists in the UK. I have a passion for POCUS and peri-operative medicine and hope to further research in this field. I am passionate about providing pain-relief and anaesthetic services to impoverished settings and hope to further research in creating modalities and empowering health care workers to treat a larger pool of patient effectively with the help of technology.

Abstract

Background: The use of ultrasound gel as a coupling medium has been the standard of practice for all ultrasound studies performed at most hospitals worldwide. This study aimed to introduce petroleum jelly [petrolatum] as an alternative coupling agent, specifically with regard to focus assessed transthoracic echocardiography [FATE], by comparing its use to conventional ultrasound gel.

Methods: A crossover, double-blinded, non-inferiority study was conducted to ascertain whether petroleum jelly scores equal to ultrasound gel in terms of image quality [depth, penetration, detail, and overall quality] and user experience [pressure applied, amount of gel used, user friendliness, and patient tolerance] using a General Electric [GE] Vscan Extend handheld ultrasound [HHU] device. The automated ejection fraction calculation was also noted and statistically compared.

Results: No significant difference was found between image quality or user experience in FATE scans performed with the conventional ultrasound gel and petroleum jelly. The automated ejection fraction calculation results obtained from scans with petroleum jelly showed minimal inter-user variability. Blinded sonographic review also did not rate the images obtained with either coupling medium significantly different in any measure. Finally, petroleum jelly is more cost effective than conventional ultrasound gel.

Conclusion: Petroleum jelly produces images of comparable quality to that obtained using conventional gel. The use of petroleum jelly as an alternative coupling medium could increase the practice of ultrasound in settings with resource limitations.

Keywords: ultrasound, echocardiography, point-of-care, critical care

Abstract 68

Thirty-day unplanned reoperation following spinal surgery: How does the South African private sector measure up?

Dr Marcus Van Heukelum[1], Dr Theresa Mann[1], Prof Ian Vlok[1], Dr Johan Davis[1]
[1]*Sun, Cape Town, South Africa*

Biography:
Marcus van Heukelum completed his Orthopaedic training in 2021 and is currently busy with the AO spinal surgery fellowship.

Background:
Thirty-day readmission rate and 30-day reoperation rate are recognized indicators of the quality of care, including surgical performance and adverse events. While these indicators have been reported in numerous studies from developed countries, little is known about readmission and reoperation following spinal surgery in South Africa, including the private healthcare sector. Therefore, the main aim of this study was to describe the overall rate of unplanned reoperation within 30-days of spine surgery in the private sector. Secondary aims were to describe the 30-day all-cause readmission rate and the reasons for 30-day reoperation.
Methods:
This retrospective cohort study was based on an anonymized dataset of spine surgeries funded by the largest open medical scheme in South Africa between 2008 and 2017. The dataset was processed to identify descriptors of each surgery, including the year of operation, patient demographics, spinal pathology, spine region and certain procedures. The primary outcome was reoperation within 30-days, which was identified based on the time to the second operation, diagnostic codes and procedure codes.

Results:
A total of 49,396 spine surgeries were included in the study, of which at least 38,218 (77%) were for degenerative pathology. Overall, 3,204 (6.5%) surgeries were associated with 30-day readmission for any cause and 441 (0.9%) patients underwent a second spine surgery within 30 days of the initial spine procedure. The most common reasons for the 441 reoperations were nerve root compression (222, 50%) and arthrodesis (70, 16%).

Conclusion:
Spine surgery in the South African private sector is associated with low rates of 30-day readmission and reoperation, suggesting a good quality of perioperative care. Furthermore, the findings compare favourably with those from developed countries. Future studies should investigate long-term reoperation following spinal surgery so as to provide more comprehensive insight on the quality of spinal surgery care in our setting.

Theme 6 - Maternal and Child Health / Tema 6 – Moeder en Kind Gesondheid

Abstract 69

The burden and outcomes of selected congenital surgical abnormalities at a tertiary care South African neonatal intensive care unit.

Dr Ilhaam Abrahams[1], Dr Lizelle Van Wyk[1], Dr Corne de Vos[2]
[1]Stellenbosch University, Cape Town, South Africa, [2]Department of Paediatric Surgery, Stellenbosch University, Cape Town, South Africa

Biography:
Ilhaam Abrahams completed her post graduate training in paediatrics at Stellenbosch University. She has recently completed her certificate training in Neonatology here. This project is part of Mphil project.

Title: The burden and outcomes of selected congenital surgical abnormalities at a tertiary care South African neonatal intensive care unit

Background: The burden of disease of congenital surgical abnormalities is not well described in our setting.

Methods: We conducted a retrospective descriptive analysis of neonates (newborns < 28days old) admitted to a tertiary care South African neonatal intensive care unit (NICU) with selected congenital surgical abnormalities over a 5 year period. Patient demographics, clinical presentation, pre and post-operative course and outcomes were analysed.

Results:
There were 84 neonates identified who met our study criteria.
The mean gestational age was 35 weeks (SD 3.19) and birthweight 2518g (SD 789.3).

The clinical presentation was primarily with bile-stained vomiting (34/79; 43.0%) and delayed passage of stool (25/54; 46.3%) while over a third (30/84; 35.7%) were diagnosed on antenatal ultrasound. The most common lesion were the intestinal atresias (33/84; 39.3%), followed by omphalocoeles (18/84; 21.4%) and anorectal malformations (12/84; 14.3%).

The majority of neonates in this cohort underwent surgery (74/84; 88.0%) with the median age at surgery being 2 days (IQR 1.5-5). Ventilation was required in 16/81 (19.8%) neonates pre-operatively and 48/74 (64.9%) post-operatively. Full feeds were achieved at a median time of 13 days (IQR 9-18) post-operatively and those neonates with omphalocoeles achieved full feeds earliest at a median time of 7 days (IQR 5-14). Nearly half (33/73; 45.2%) of neonates were treated for post-operative sepsis.

The 30 day post-operative survival in this cohort was high (72/74; 97.3%). Overall survival to discharge/transfer was 72/84 (85.7%) and survival to 1 year was 50/67 (74.6%).

Conclusion: The 30 day post-operative mortality of these selected congenital surgical abnormalities was low. Possible limiting factors include small study numbers and the exclusion of congenital surgical abnormalities with a higher mortality rate. The morbidity however remains high

Abstract 70

Caregivers' perspectives on health-related quality of life domains for children with tuberculosis and other respiratory illnesses

Miss Michaile Anthony[1], Dr Graeme Hoddinott[1], Mrs Margaret Van Niekerk[1], Mrs Levern Africa[1], Miss Angelique Pienaar[1], Ms Asanda Mfwaze[1], Ms Beauty Bavuma[1], Dr Isabelle Dewandel[1], Dr Carla Mckenzie[1], Professor Anneke Hesseling[1], Associate Professor Marieke Van der Zalm[1]

[1]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, South Africa, Parow , South Africa

Biography:

Michaile Gizelle Anthony is a Junior Study coordinator and has a Master of Arts in Psychology. She is a registered Research Psychologist and Registered Counsellor with the Health Professions Council of South Africa. She has over 4 years of experience in TB/HIV research. My research focuses on understanding a) quality of life among children diagnosed with a respiratory illness, b) developing quality-of-life tools to measure the impact of respiratory illnesses c) understanding the burden of providing care to children diagnosed with respiratory illnesses and d) understanding and explaining the socioeconomic contexts of families of children diagnosed with respiratory illnesses.

BACKGROUND

There is lack of holistic health-related quality of life (HRQoL) measures for children aged 0-5 years with respiratory illnesses. We aimed to understand caregivers' perceptions of the relevance of common HRQoL domains for their children's experience of respiratory illnesses.

METHODS

Data collection was nested in a prospective observational cohort study of children routinely presenting to a public hospital with respiratory symptoms presumptive of pulmonary tuberculosis (PTB). We used purposive sampling and conducted 10 semi-structured in-depth interviews with children's caregivers (<5 -years of age) with TB and other respiratory illnesses to explore perceptions of the relevance of 5 commonly measured HRQoL domains; physical health, social support, emotional and psychological wellbeing, and schooling. We used case descriptive analysis and thematic coding.

RESULTS

Caregivers were the parents (n=9) or grandparents (n=1) of 10 children; 5 girls and 5 boys. The participants' socioeconomic context framed their responses while exploring HRQoL; QoL was expressed to be about having sufficient basic resources for children to not experience deprivation e.g., food. HRQoL experiences varied according to the severity of the child's symptoms. Manifestations in the psychological domain were difficult to distinguish from the emotional domain; however, some behavioural changes in children were observable by the caregivers/parents. Caregivers felt that social support should be expanded to also include extended family members. Although children were pre-school age, caregivers were concerned about the impact of respiratory illness on their children's early development milestones and future schooling.

CONCLUSION

This exploratory study shows that HRQoL domains require some adaptation to be applicable for young children affected by respiratory illness.

Abstract 71

Tuberculosis Preventive Therapy (TPT) implementation in three South African provinces: facility-level review

Miss Dzunisani Baloyi[1], Ms Michaile Anthony[1], Ms Kyla Meyerson[1], Ms Sindisiwe Mazibuko[2], Mr Dillon Wademan[1], Dr Lario Viljoen[1], Ms Hanlie Myburgh[1], Dr Karen Du Preez[1], Dr Muhammad Osman[3], Dr Yael Hirsch-Moverman[4], Prof Salome Charalambous[5], Prof Harry Hausler[6], Prof Anneke Hesseling[1], Dr Graeme Hoddinott[1]
[1]Desmond Tutu TB Centre, Stellenbosch University , Cape Town, Parow, Lower Level Clinical Building, Francie Van Zijl Drive, South Africa, [2]University of KwaZulu-Natal, Department of Psychology, Pietermaritzburg, Scottsville, South Africa, [3]University of Greenwich, School of Human Sciences, London, United Kingdom, [4]ICAP at Columbia University, Mailman School of Public Health, New York, New York , United States of America, [5]The Aurum Institute, Parktown, Johannesburg , South Africa, [6]TB HIV Care, Cape Town , South Africa

Biography:
Miss Dzunisani Baloyi has completed an MSc Research Psychology and intends to register for PhD in Paediatrics and Child Health. She is registered as research psychologist with the Health Professions Council of South Africa. Since joining Desmond Tutu TB Centre in 2019, she has supported several projects at the Desmond Tutu TB Centre and is currently the lead social scientist for the Care4TBMkids study.

Background: South Africa has one the highest TB and HIV burdens globally. TB preventive therapy (TPT) reduces the risk of TB disease and TB-related mortality in adults and children living with HIV and is indicated for use in TB-exposed HIV-negative individuals and children. TPT implementation in South Africa remains suboptimal.

Methods: We conducted a pragmatic review of TPT implementation using multiple data sources including informant interviews (n=134), semi-structured observations (n=93), and TB patient folder reviews in 31 health facilities purposively selected across three high TB burden provinces. We used case descriptive analysis and thematic coding to identify barriers and facilitators to TPT implementation.

Findings: TPT programme implementation is suboptimal, with inadequate monitoring even in health districts with well-functioning TB services. Health workers reported skepticism about TPT effectiveness, deprioritised TPT in practice and expressed divergent opinions about the cadres of staff responsible for implementation. Service-and facility-level barriers included ineffective contact tracing, resource shortages, lack of standardised reporting mechanisms, and insufficient patient education on TPT. Patient-level barriers included socio-economic factors.

Conclusions: Improving TPT implementation will require radically simplified and more feasible systems and training for all cadres of health workers. Partnership with communities to stimulate demand driven service uptake can potentially facilitate implementation.

Abstract 72

Psychosocial distress of young adult and adult childhood cancer survivors in a South African cohort

Dr Anel Van Zyl[1], Prof Paul C Rogers[1,2], Prof Mariana Kruger[1]
[1]Department of Paediatrics and Child Health, Faculty of Medicine and Child Health, Stellenbosch University, Tygerberg hospital, Francie Van Zijl Drive, Parow, South Africa, [2]Department of Pediatrics, University of British Columbia, Vancouver, Canada

Biography:
Dr Anel van Zyl is a paediatric oncologist at the Tygerberg hospital Paediatric Haematology/Oncology unit and senior lecturer at Stellenbosch University since 2008. She is currently working on her PhD about the late effects of childhood cancer survivors in South Africa with the aim of developing a national long-term follow-up programme. She is involved in several national and international research projects as member of the South African Childhood Cancer Study Group.
She also has a keen interest in benign haematological
and bleeding disorders and is a member of the Medical and Scientific Advisory Committee of the South African Haemophilia Foundation.

Background

As childhood cancer survivors (CCSs) may experience psychosocial late effects, we investigated psychosocial distress in a South African cohort.

Methods

CCSs 18 years and older, treated at Tygerberg hospital, Cape Town, 1983 – 2012, completed the Brief Symptom Inventory-18. Internal consistency was acceptable: Cronbach's alpha values were 0.91 (Global Severity Index (GSI)), 0.85 (depression), 0.83 (somatisation) and 0.75 (anxiety). We compared results utilising different case rules (GSI T scores of ≥ 50, ≥ 57 and ≥ 63).

Results

Forty CCSs (male: female 0.54:1) with a mean age of 24.2 years were included. The mean follow-up period was 16.6 years. Most (23/40; 58%) completed school or tertiary education and were unmarried (36/40; 90%). The cancer diagnoses included hematological malignancies (26/40; 65%) and solid tumors (14/40; 35%). Using a GSI T score of ≥ 63 identified 10% (4/40) of survivors with psychological distress; a score of ≥ 57 identified 32.5% (13/40) and ≥ 50 identified 45% (18/40). Radiotherapy (odds ratio (OR) 4.6; p = 0.035), presence of ≥ 6 late effects (OR 7.5; p = 0.026) and severe late effects (OR 6.6; p = 0.024) were significant risk factors (GSI T score ≥ 57). Follow-up period of 11-20 years (OR 7.3; p = 0.034) was significant for a GSI T score ≥ 50.

Conclusion

This South African cohort's level of psychosocial distress was at the higher end of ranges reported in the literature. Significant contributing factors were radiotherapy, the presence of ≥ six or severe late effects and a follow-up period of 11-20 years. CCSs should have regular screening for psychosocial distress and those at risk should be referred for formal psychological assessment.

Abstract 73

Maternal and neonatal outcomes of COVID-19 in a high-risk pregnant cohort with and without HIV

Dr Liesl De Waard[1], Dr Eduard Langenegger[1], Dr Kobie Erasmus[1], Dr Tian van der Merwe[1], Dr Sussanna E Olivier[1], Dr Nicolene du Toit[1], Dr Chane Paulsen[1], Dr Nontando Nkangana[1], Dr Magriet Van Niekerk[2], Dr Ashley Moodley[1], Mrs Sonia Schell[1], Dr Jantjie Taljaard[3], Prof Mathys Hennie Botha[1], Prof Angela Dramowski[2], Prof Catherine Anne Cluver[1], Prof Adrie Bekker[2]

[1]Department of Obstetrics and Gynaecology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Department of Paediatrics and Child Health Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]Division of Infectious Diseases, Tygerberg Hospital, Department of Medicine Faculty of Medicine and Health Sciences, Stellenbosch University , Cape Town, South Africa

Biography:

Liesl de Waard is an Obstetrician and Gynaecologist working at Tygerberg Hospital as a general specialist and senior lecturer. She enjoys teaching and research and is currently working towards her Phd on the topic of Caesarean Section training.

The impact of SARS-CoV-2 infection in pregnant women living with HIV (PLHIV) has not been described previously.

Objectives: To describe the clinical presentation and outcomes of a cohort of women with high-risk pregnancies with confirmed COVID-19 to determine whether risk factors for disease severity and adverse outcomes of COVID-19 differed in pregnant women without HIV compared with PLHIV.

Methods: We prospectively enrolled pregnant women with COVID-19 attending the high-risk obstetric service at Tygerberg Hospital, from 1 May to 31 July 2020, with follow-up until 31 October 2020. Information on demographics, clinical features, and
maternal and neonatal outcomes was collected and compared for PLHIV v. pregnant women without HIV.

Results: One hundred women (72 without HIV and 28 PLHIV) with high-risk pregnancies had laboratory-confirmed COVID-19. Among the 28 PLHIV, the median (interquartile range) CD4 count was 441 (317 - 603) cells/µL, and 19/26 (73%) were virologically suppressed. COVID-19 was diagnosed predominantly in the third trimester (81%). Obesity (BMI ≥30 in n=61/81; 75%) and hypertensive disorders were frequent comorbidities. Of the 100 women, 40% developed severe or critical COVID-19, 15% required intensive care unit admission and 6% needed invasive ventilation. Eight women died, 1 from advanced HIV disease complicated by bacteraemia and urosepsis. The crude
maternal mortality rate was substantially higher in women with COVID-19 compared with all other deliveries at our institution during this period (8/91 (9%) v. 7/4 058 (0.2%); p<0.001). Neonatal outcomes were favourable. No significant differences in COVID-19 risk factors, disease severity, and maternal/neonatal outcome were noted for PLHIV v. those without HIV.

Conclusions: In this cohort of high-risk pregnant women, the impact of COVID-19 was severe, significantly increasing maternal mortality risk compared with baseline rates. Virally suppressed HIV infection was not associated with worse COVID-19 outcomes in pregnancy.

Abstract 74

A Feasibility Randomized Controlled Trial evaluating interactive weekly mobile phone text messaging plus motivational interviewing versus standard infant feeding counselling in promotion of breastfeeding among women living with HIV in South Africa

Moleen Dzikiti[1], Prof Taryn Young[1], Prof Mark Cotton[1], Prof Lehana Thabane[2]
[1]*Stellenbosch University, Cape Town, South Africa,* [2]*McMaster University, , Canada*

Biography:
Dr, Moleen Dzikiti nee Zunza, Senior Lecturer, Division of Epidemiology & Biostatistics, Stellenbosch University. Her goals are to contribute to society by generating research evidence for policy formulation and guiding clinical practice decision making, especially in people who are disproportionately affected by HIV/AIDS. Primary research interests include: design and analysis of observational studies, and adaptive clinical trials.

Introduction
Despite established evidence on breastfeeding benefits, global efforts on improving breastfeeding practices, progress in achieving optimal breastfeeding practices is minimal. South Africa has one of the lowest exclusive breastfeeding rates, 8% in infants under 6 months of age. Mobile text messaging and motivational interviewing are beneficial across many health problems. We conducted the study to assess whether a future appropriately powered RCT on effect of motivational interviewing plus text messaging on infant feeding practices was feasible with regards to i) recruitment and retention, ii) protocol adherence, (iii) potential effect of the intervention on sustaining breastfeeding at week 24 of child's age.
Methods
Women were included if they initiated breastfeeding within 24 hours of giving birth at Worcester CDC midwife obstetric unit, on antiretroviral treatment, ≥18 years. We randomly assigned mother-infant pairs to receive weekly text messaging encouraging exclusive breastfeeding and in-person individual motivational interviews post-delivery at weeks 2, 6, and 10 or standard infant feeding counseling during routine postnatal clinic visits.
Results
One hundred twenty-three mothers were screening, we excluded 71 non-eligible participants. We recruited five participants per month over 11 months. We assigned 27 and 25 mother-infant pairs to intervention and control groups, respectively. About 65% of the participants had outcome evaluation at week 10 and 35% at week 24. Twenty participants had week 24 visit planned between 20 March and August 2020, a period COVID-19 lockdown was implemented. Of these, 4 completed the visit telephonically, one withdrew and 15 were lost to follow up. Exclusive breastfeeding rates were high across the groups through week 24. There was insignificant increase in exclusive breastfeeding rates at week 24 in the intervention group (78% versus 56%), p-value = 0.20.
Conclusions
With realistic study accrual timeline, a definitive trial is feasible. Combination of in-person and telephonic follow-up may increase study participation.

Abstract 75

The Impact of the COVID-19 Pandemic on the Healthcare Utilization and Outcome of Children < 5 Years of Age in Metro East, Cape Town

Dr Noradin Elmi[1]
[1]*Stellenbosch University, , South Africa*

Biography:
I'm Dr Noradin Elmi. One of the Pediatrics registrars in Tygeberg Hospital.

Impact of the COVID-19 Pandemic on the Healthcare Utilization and Outcome of Children < 5 Years of Age in Metro East, Cape Town
Noradin Elmi1, Liezl Smit1, Thandi Wessels1, Helena Rabie1,

Introduction
Lockdown policies resulted in closure of schools and businesses with a de-escalation of non-COVID-19 healthcare services during pandemic. Despite concerns about the indirect effect this may have on child health outcomes, few studies have reported the impact of the COVID-19 pandemic on children in the South African context.

Methods
A retrospective cross sectional study was done to compare routinely collected child health data from 1 March – 30 September 2020 with similar time periods in 2018 and 2019.

Provisional Results(final statistical analysis still to be completed)
During the 2020 time period, 34,7% less children were seen at Metro East PHC compared to the same period in 2019, Tygerberg SD 37,1% less ,Khayelitsha SD35,6% less, Northern SD 25,1% less and Eastern SD 57,6% less. Number of fully immunized children at 1year of age decreased by 6,8%. Hospital admissions < 5years were significantly reduced, TBH admitting 52,6% less, KDH 50,9% less, KBH 30,4% less and HH 27,6% less. Although the percentage of children < 5 admitted with acute gastro-enteritis and SAM remained similar across time periods, the percentage of acute respiratory infections decreased in 2020 compared to 2019; TBH admitted 71,3% less, KDH 61,7% less, KBH 32,7% less and HH 43,2% less. The in-hospital mortality rate for TBH increased from 2,7% to 4,8%. For KDH and KBH was unchanged, and decreased at HH from 1,8% to 0,9%.

Conclusion
Lockdown policies during the pandemic resulted in a marked decrease in the utilization of healthcare across Metro East. The reduced uptake of preventative primary healthcare services may result in a subsequent increase in preventable diseases within the Metro in future.

Abstract 76

Outcomes of Low Birth Weight and Premature infants requiring admission to hospital, from the Northern and Tygerberg Health subdistrict, risk stratified by Maternal Mental Health

Dr Cordelia Ely[1]
[1]*Stellenbosch University, Kuilsriver , South Africa*

Biography:
Dr Cordelia Ely, final year Paediatric Registrar, wife and mother to three boys invested in optimizing infant outcomes of infants and interested in utilitising Child Health to improve secondary health screening for mother's at risk for medical disorders.

Introduction:
The First 1000 days is a campaign commissioned by the Western Cape Government that highlights the importance of the mother-infant dyad to optimize the developmental outcomes, morbidity, and mortality of Infants. Perinatal Depression disproportionately affects mothers in LMIC settings and may affect both maternal responses to their infant and infant outcomes. This study looks at the Maternal Mental Health screening of vulnerable infants, community support structures for this vulnerable dyad and lastly infant outcomes within the first 6 months after birth.

Methods:
This is a prospective cohort study of infants and their mothers hospitalized in the Northern and Tygerberg health sub-districts within the first 12 weeks of life. Low birth weight and pre – term infants were recruited, and maternal mental health screening was performed with recruitment. Participants were recruited over a one-year period from 1 November 2020 to 31 October 2021 with subsequent follow up until the infants reached 6 months chronological age.

Results: (Preliminary)
A total of 104 mother-infant pairs were recruited. Sixty-two mothers (60%) screened positive for risk of maternal mental health problems using 3 mental screening tools namely EPDS, PHQ-9 and GAD 7. With overall analysis of the entire cohort of infants the following was demonstrated: 4 infants (3.8%) confirmed deaths, 13 (12.5%) dyads migrated, 7 infants (6.7%) lost to follow up and 80 infants (77%) were alive at 6months follow up.

Conclusion:
This is the first study performed at two hospitals in the Northern and Tygerberg health sub-districts, to evaluate Maternal Mental Health and the associated morbidity of low birth weight and premature infants. Majority of mother's demonstrated a need for maternal mental health screening and subsequent support. Good 6month infant survival rates were demonstrated with potential excellent retention capacity of Community Based Services.

Abstract 77

The impact of COVID-19 on TB testing and diagnosis in children and adolescents in the Western Cape Province, South Africa

Karen Du Preez[1], M Smith[2], A von Delft[2,3], Andrew Boulle[2,3], Mary-Ann Davies[2,3], HS Schaaf[1], JR Starke[4], AC Hesseling[1]

[1]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, [2]Health Intelligence, Western Cape Government Health and Wellness, Cape Town, South Africa, [3]Division of Public Health Medicine, School of Public Health and Family Medicine, University of Cape Town, Cape Town, South Africa, [4]Baylor College of Medicine, Houston, USA

Biography:

Dr Karen du Preez is a clinical epidemiologist and senior researcher at the Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University, South Africa. Her research focuses on epidemiological and operational aspects of paediatric TB to allow a more effective response to the TB epidemic in children and adolescents. She is currently principal investigator of an NIH K43-award to investigate the burden and outcomes of children with TB meningitis at a global and national level in South Africa, and to identify opportunities for prevention and earlier diagnosis.

Background:
The COVID-19 pandemic has had devastating effects on tuberculosis (TB) care globally with repeated disruptions of routine services and reduced access to care. Little is known about the pandemic's impact on child and adolescent TB. We investigated trends in TB investigation and diagnosis in children and adolescents in routine healthcare services in the Western Cape, South Africa, before and after the onset of COVID-19 to assess the impact on and response of TB services.
Methods:
Aggregate, de-identified data on Xpert MTB/RIF investigations and all TB episodes diagnosed over a 5-year period (2017-2021) were extracted from the Provincial Health Data Centre. Age-disaggregated descriptive analyses were completed for 3 age groups: children (0-9 years), adolescents (10-19 years) and adults (20+ years), comparing pre-COVID TB detection during 2017-2019 with data from 2020-2021.
Results:
There was a major decline in testing in children and adolescents in 2020 - approximately double the drop observed in adults (35% and 28%, compared to 15%). In 2021, testing amongst adults almost returned to the pre-COVID average (2% remaining decrease). Testing amongst children and adolescents had to overcome a bigger gap, with remaining deficits of 14% and 16% respectively in 2021. The number of TB episodes also dropped in 2020, with 18% (children), 17% (adolescents) and 21% (adults) reductions and a concerningly slow return (remaining 11%, 16% and 14% deficits). The remaining deficit and slow return in adolescents are particularly alarming.
Conclusion:
The substantial drop in TB testing and diagnosis during 2020 and 2021 in children and adolescents and services have not yet recovered across all age groups. Large pre-pandemic deficits are compounded by historically low testing and a lack of catch-up diagnosis. Adolescents appear particularly affected and may need special attention in COVID mitigation strategies. Improvements in TB case detection in children and adolescents is a priority.

Abstract 78

Pregnancy outcomes among South African women with tuberculosis in the context of HIV

Dr Sue-ann Meehan[1], Prof Anneke C. Hesseling, Ms Mariette Smith, Dr Arne von Delft, Dr Florian Marx, Dr Muhammad Osman
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Sue-Ann Meehan, a research psychologist joined the Desmond Tutu TB Centre, Stellenbosch University, in 2008. She has a wealth of experience leading implementation science projects that have focused on health system strengthening, improving access to health services, implementation of community-based integrated services and the use of routine TB and HIV data for improved patient outcomes. Her other interests include health economics and socio-behavioural science. Having worked across high TB and HIV burdened communities within South Africa, Sue-Ann remains actively committed to provide data driven recommendations to health services, thereby bridging a gap between service delivery and research.

Background
The incidence of tuberculosis (TB) in South Africa was ~554/100,000 population in 2020 with an antenatal maternal HIV prevalence of ~30%. Maternal TB increases the risk of adverse pregnancy outcomes especially in the context of maternal HIV co-infection. We describe TB and pregnancy outcomes in women with and without HIV routinely diagnosed with TB in a programmatic setting in South Africa.
Methods
We identified all pregnant women routinely diagnosed with TB in 2 high-burden sub-districts (Tygerberg and Khayelitsha) in Cape Town, South Africa, October 2018 to March 2020, through the Western Cape Provincial Health Data Centre. We distinguished between favourable (successfully completed TB treatment) and unfavourable TB outcomes (WHO TB reporting outcomes and loss to follow up (LTFU) prior to linkage to care and death, irrespective of TB treatment completion). Favourable pregnancy outcome was defined as a pregnancy that resulted in an infant alive at 28 days, with a birth weight ≥2500g and gestational period ≥37 weeks.
Results
Overall, 270 pregnant women with TB were identified, median age 27.9 years (IQR:23-32), 211/270(78%) bacteriologically confirmed, 50/270(19%) with previous TB, and 143/270(53%) living with HIV, all on ART. The median CD4 count (closest to TB diagnosis) was 235.5 (IQR:118-444). Overall, 90/270(33%) had unfavourable TB outcomes; 30/90(33%) were LTFU prior to linkage to care, of which 7/30(23%) died. 39/127(31%) HIV-negative women, and 51/143(36%) HIV-positive women had unfavourable TB outcomes. Almost half of the women with unfavourable TB outcomes had an unfavourable pregnancy outcome (48% in HIV-negative and 53 % in HIV-positive TB women, respectively).
Conclusions
TB outcomes were poor in pregnant women, irrespective of HIV status. Women with poor TB outcomes were at very high risk of unfavorable pregnancy outcomes. Pregnant women with TB are an extremely vulnerable group and require prioritized TB care to ensure good TB and pregnancy outcomes.

Abstract 79

Outcome of Retinoblastoma treatment protocol for developing countries as per SIOP-PODC recommendation in South Africa

Professor Mariana Kruger[1], Dr Sabine L van Elsland[1], Dr Linda Wainwright[2], Dr Alan Davidson[3], Prof David Stones[4], Prof Gita Naidu[2], Prof Jennifer Geel[5], Ms Judy Schoeman[1,8], Dr Clare Stannard[6], Dr Anel Van Zyl[1], Dr Karen Lecuona[7]

[1]Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University & Tygerberg Hospital, Cape Town, South Africa, [2]Department of Paediatrics and Child Health, University of the Witwatersrand and Chris Hani Baragwanath Academic Hospital, Johannesburg, South Africa, [3]Haematology-Oncology Service, Department of Paediatrics and Child Health, University of Cape Town & Red Cross Children's Hospital, Cape Town, South Africa, [4]Department of Paediatrics, University of the Free Sate & University Hospital, Bloemfontein, South Africa, [5]Paediatric Haematology Oncology, Department of Paediatrics, Faculty of Health Sciences, University of Pretoria & Charlotte Maxeke Johannesburg Academic Hospital, Pretoria, South Africa, [6]Department Radiation Oncology, Faculty of Health Sciences, University of Cape Town & Groote Schuur Hospital, Cape Town, South Africa, [7]Department Ophthalmology, Faculty of Health Sciences, University of Cape Town & Groote Schuur Hospital, Cape Town, South Africa, [8]Department of Paediatrics, Faculty of Health Sciences, University of Pretoria & Steve Biko Academic Hospital, Pretoria, South Africa

Biography:

Mariana Kruger is a paediatric oncologist and ethicist. Full Professor and Executive Head,Dept Paeds & Child Health,Tygerberg Hospital, Stellenbosch University. Past African Continental President (SIOP). Has publications in paediatric oncology, HIV, research ethics, several chapters in books,editor, author of an African research ethics guidebook. Founder member and co-principal investigator of (SARETI), funded by Fogarty International Centre, NIH, USA. An honorary professor School of Applied Human Sciences (Psychology) University KwaZulu-Natal. Served on several ethics review committees, and currently a member of Stellenbosch University Senate Ethics Review Committee, and Committee for Postgraduate Research.

Retinoblastoma, a curable childhood cancer, is often diagnosed late in low- and middle-income countries.
This study describes outcomes of children with retinoblastoma in South Africa, treated with the first implemented standard national treatment protocol for a childhood cancer.
All children diagnosed with retinoblastoma, diagnosed between 2012 and 2016 in five South African paediatric oncology units (POU) were treated with a standard treatment protocol, based on the Paediatric Oncology – Paediatric Oncology in Developing Countries (SIOP-PODC) guideline for high income settings. Treatment included local intraocular therapy, with/without chemotherapy (vincristine, etoposide, carboplatin), with/without surgery, and with/without radiotherapy for advanced disease. The endpoint was survival at 24 months and reported with Kaplan Meier curves with log rank (Mantel-Cox) Chi-Square ($\chi 2$) with respective p-values reported.
There were 178 children; 68% presented with unilateral disease. Median age was 27 months (range 0-159 months) with a male to female ratio of 1:0.75. Overall survival (OS) was 78.1% (139/178) at 24 months post diagnosis with significant association with stage at diagnosis ($p<0.001$) and age for those under 2 years versus 2 years and older ($p=0.001$), with no association sex ($p=0.333$) and between unilateral versus bilateral disease ($p=0.532$). The estimated cumulative survival was 0.790 (std error 0.031) at 24 months. Causes of death were disease progression/relapses 76.3% (29/38), abandonment of treatment 21.1% (8/38) and unknown causes 2.6% (1/38).
Efficacy was proven with the national treatment protocol and outcome was significantly associated with stage at diagnosis.This study documented the feasibility of implementing a national childhood cancer treatment protocol, involving multidisciplinary teams in South Africa.

Abstract 80

Development and internal validation of a neonatal healthcare-associated infection prediction score (NeoHoP score)

Dr Lizel Lloyd[1], Prof Mirjam van Weissenbruch[2], Prof Angela Dramowski[1], Prof Adrie Bekker[1]
[1]Stellenbosch University, Cape Town, South Africa, [2]Vrije Universiteit, Amsterdam, Netherlands

Biography:
Dr Lloyd is a neonatologist at Tygerberg Hospital, currently enrolled in a PhD in Paediatrics. The focus of her research is to identify and/or develop improved diagnostic options for neonatal infections in resource-restricted settings.

Introduction: Clinical and laboratory parameters used in prediction models may facilitate early identification of neonates at risk for healthcare-associated infection (HAI), but existing prediction models have low sensitivity in South African neonates. We aimed to develop and validate an HAI prediction model for very low birth weight (VLBW) neonates (<1500 grams).

Methods: A retrospective cohort of VLBW neonates aged >72 hours of life and hospitalized at the Tygerberg Hospital neonatal unit in Cape Town (January 1, 2016-December 31, 2017), was used. The cohort was randomized into unmatched groups for model development and internal validation. To develop the model, univariate analysis was performed identifying variables with $p<0.1$ for logistic regression analysis. Variables with a $p<0.05$ were included in the final model with bootstrapping to correct for possible overoptimistic results. The final model score was applied to the validation cohort, and the predictive value was assessed using Receiver Operating Characteristic (ROC) curves.

Results: A capillary refill time of >3 seconds, lethargy, abdominal distention, presence of a central venous catheter (current/in the previous 48 hours), and a raised CRP >10 mg/L were identified as the best predictors of HAI in a binary logistic regression model. At a score of ≥2, the model sensitivity, specificity and accuracy was 54%, 96% and 80%, respectively. The positive and negative predictive values were 91% and 77%, respectively, with a positive likelihood ratio of 15. The area under the ROC curve was 0.90.

Conclusion: This novel neonatal infection prediction score performed well on internal validation as a rule-in test for HAI in VLBW neonates. External validation of the NeoHoP score is required to assess its generalisability in other resource-limited neonatal units.

Abstract 81

LC-MS/MS Method Development and Validation for the Determination of Sulfasalazine and Sulfapyridine in Placenta: Application to a Pharmacokinetic Study

Miss Vanessa Louw[1], Dr Fiona Brownfoot[2], Prof Catherine Cluver[1], Dr Tracy Kellermann[1]
[1]University of Stellenbosch, , South Africa, [2]University of Melbourne and The Mercy Hospital for Women, , Australia

Biography:
Vanessa is a second year MSc (Pharmacology) candidate in the Division of Clinical Pharmacology, and the focus of her research is pharmacokinetic analyses of drugs in various biological matrices. Vanessa is a hard-working, diligent student who continuously strives to obtain high quality research. Furthermore, she has excellent team building and leadership skills. Vanessa aims to make valuable contributions towards the scientific community by participating in novel research for her MSc as well as in any future research that she will partake in.

Background: An early phase clinical trial at The Mercy Hospital for Women (Australia) assessed the use of sulfasalazine as a treatment for preterm pre-eclampsia. This project aimed to develop and validate a Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS) method according to FDA and EMA guidelines to simultaneously quantitate sulfasalazine and its metabolite, sulfapyridine, in placenta for pharmacokinetic analysis.
Methods: LC-MS/MS was used to monitor the mass-to-charge (m/z) transition of the protonated precursor ions m/z 398.90 and m/z 250.07 to the product ions m/z 381.05 and m/z 156.00 for sulfasalazine and sulfapyridine, respectively, using sulfasalazine-d4 and sulfapyridine-d4 as internal standards. 100 µL of placental tissue homogenate was extracted using acetonitrile:methanol (90:10, v/v), followed by elution through hydrophilic-lipophilic balanced cartridges. Gradient elution using a mobile phase combination of water + 0.1% formic acid (A) and acetonitrile:methanol (90:10, v/v) + 0.1% formic acid (B) was used. Separation was achieved using a Poroshell C18 column. The calibration curve fits a quadratic regression (weighted by 1/x, x=concentration) for both sulfasalazine and sulfapyridine over the range 30-30000 ng/ml.
Results: The average accuracy of calibration standards during intra- and inter-day validations ranged from 94.2-103.2% (%CV= 1.4-10.8) for sulfasalazine and 96.6-103.4% (%CV= 1.4-8.3) for sulfapyridine. The accuracy of quality controls ranged from 101.6-112.7% (%CV= 4.4-6.7) and 97.4-108.4% (%CV= 3. 7-10.0) for sulfasalazine and sulfapyridine, respectively. The average recovery of sulfasalazine and sulfapyridine from placental homogenate was 121.5% and119.6%, respectively. In patient samples (n= 9) the concentrations ranged from 1277-10922 ng/g tissue for sulfasalazine and 1655-69565 ng/g tissue for sulfapyridine, with two patient samples below the limit of quantitation (BLQ) of the assay for both analytes.
Conclusion: An LC-MS/MS method for the quantification of sulfasalazine and sulfapyridine in human placenta was successfully validated and applied to a clinical study to evaluate the efficacy of sulfasalazine as an intervention for pre-eclampsia.

Abstract 82

A systematic review of cerebral palsy in African paediatric populations

Dr Serini Murugasen[1], Prof Priscilla Springer[1], Prof Kirsten Donald[2]
[1]*Stellenbosch University, , South Africa,* [2]*University of Cape Town, , South Africa*

Biography:
Dr Serini Murugasen is a paediatrics registrar in her final year of training. She has previously completed a Masters in Public Health and a Masters of Science by Research at the University of Oxford. She has an interest in paediatric neurology and neurodevelopment and chose to focus her MMed thesis on cerebral palsy in Africa.

Introduction
Most knowledge on cerebral palsy (CP) comes from studies done on North American and European populations. Translating this information into African contexts is difficult and flawed due to the dearth of information on prevalence, aetiology, co-morbidities, therapies, functional outcomes and challenges faced by African children with CP.

Methods
PubMed, SCOPUS and Web of Science databases were searched for original research on children with CP under 18 years of age published from 2000-2020, using explicit inclusion and exclusion criteria. 1452 articles underwent a primary and secondary survey to check they met inclusion criteria. The final selection of 58 articles was reviewed by all 3 authors.

Results
Prevalence of CP was higher among hospital than community cohorts, with a greater prevalence range than that generally reported among populations in the global North. Perinatal and neonatal events such as birth asphyxia and kernicterus were important risk factors for CP. Hospital-based cohorts had more severe functional impairment and more associated co-morbidities, but often a disproportionately low level of access to specialist care, assistive devices or rehabilitation services. Those children that did receive interventions such as strength training showed functional improvement compared to controls. Caregivers struggle significantly with financial barriers to accessing services and suboptimal understanding of this condition.

Conclusion
African children experience a higher prevalence of CP due to numerous perinatal and postnatal risk factors compared to other populations, yet derive similar benefit from therapeutic interventions when able to access them. Significant barriers prevent these children from accessing optimal care in this region.

Abstract 83

Chest x-ray features of non-severe pulmonary tuberculosis in children enrolled on the SHINE trial

Megan Palmer[1], AC Hesseling[1], MM van der Zalm[1], HS Schaaf[2], P Goussard[2], Julie Morrison[2], Aarti Kinikar[3], Syed Hissar[4], Eric Wobudeya[5], Chisala Chabala[6], Anna Turkova[7], Di Gibb[7]

[1]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, [2]Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, [3]Byramjee Jeejeebhoy Government Medical College, Pune, India, [4]India Council of Medical Research, National Institute for Research in Tuberculosis, Chennai, India, [5]Makerere University-Johns Hopkins University Care, Kampala, Uganda, [6]University of Zambia, Lusaka, Zambia, [7]Medical Research Council–Clinical Trials Unit at University College London, London, United Kingdom

Biography:

Megan Palmer is a paediatrician and clinical researcher at the Desmond Tutu TB Centre, Stellenbosch University, in Cape Town, South Africa. She has worked in the field of paediatric TB clinical research for the last 8 years focusing on diagnostics and, more recently, TB treatment trials. She is currently a PhD candidate exploring data-driven approaches to the use of imaging to diagnose and manage paediatric TB. Megan was an investigator on the SHINE trial and she and her co-authors wrote the Union's updated Diagnostic CXR Atlas for TB in Children which was launched in March 2022.

Background: SHINE was a phase-3 randomised controlled trial of treatment shortening in Zambian, Indian, South African and Ugandan children with non-severe pulmonary tuberculosis (PTB) and/or peripheral lymphadenitis. We present baseline chest x-ray (CXR) results as classified by central expert review.

Design/Methods: Baseline CXRs were interpreted by on-site clinicians to exclude severe disease and determine trial eligibility. CXRs were additionally interpreted retrospectively by a panel of paediatric specialists, to provide final CXR classification for the adjudication of TB disease status using standard clinical case definitions. For central expert review, each CXR was interpreted independently by two specialists blinded to all other information; a third specialist independently reviewed where there was lack of consensus. CXRs were classified by technical acceptability, as normal or abnormal and, if abnormal, for features "typical of TB" and for radiological disease severity. Children without PTB were excluded from this analysis.

Results: All 1157 CXRs from children enrolled with PTB were interpreted by on-site clinicians as technically acceptable and non-severe. 1127/1157 CXRs were available for expert review (Table 1). Overall, 210 (18.6%) CXRs were normal, 373 (33.1%) were abnormal but not typical of TB and 341 (30.3%) were typical of TB. Children with bacteriologically confirmed PTB were more likely to have typical CXR features (odds ratio: 2.63; 95% confidence interval: 1.82-3.80). After central expert review 71/1127 (6.3%) CXRs were classified as severe.

Conclusions: On-site clinician and central expert review of CXRs was successfully undertaken on the SHINE trial. Only 6.3% of CXRs classified as non-severe

by on-site clinicians were classified as severe by the expert panel. The radiological disease spectrum included a high proportion of normal and nontypical CXR features. This proportion was higher in children without bacteriological confirmation, where the diagnostic challenge is greatest, highlighting the urgent need for better tools to diagnose tuberculosis in children.

Abstract 84

TRACKING OF LUNG FUNCTION DURING ANTITUBERCULOSIS TREATMENT IN ADOLESCENTS WITH PULMONARY TUBERCULOSIS

Associate Professor Marieke Van Der Zalm[1], Dr Vita Jongen[2], Ruan Swanenpoel[3], Klassina Zimri[1], Dr Gezila de Beer[1], Associate Professor Brian Allwood[1], Professor Anneke Hesseling[1], Associate Professor James Seddon[4]
[1]Stellenbosch University, Desmond Tutu TB Centre, , South Africa, [2]Department of Infectious Diseases, Public Health Service Amsterdam, , The Netherlands, [3]Tygerberg Hospital, lung function, Cape Town, South Africa, [4]Section of Paediatric Infectious Diseases, Department of Infectious Diseases, Imperial College London, , United Kingdom

Biography:
I am an Associate Professor in Pediatrics and Child Health at Stellenbosch University, South Africa. I have had almost a decade of experience as an investigator working on TB studies at the Desmond Tutu TB centre (DTTC), Stellenbosch University, South Africa. Since 2020 I am the principal investigator of a TB diagnostic cohort called Umoya, which is funded through an NIH-R01 award. My main focus is to investigate the long-term impact of TB and respiratory viruses in this TB diagnostic cohort, which is funded through EDCTP and NIH-K43 awards.

Background
Little is known about post tuberculosis (TB) lung disease (PTLD) in adolescents or how lung function changes during the early phase of treatment of disease. We aimed to track lung function in adolescents during the first 2 months of antituberculosis treatment.

Methods
In a prospective cohort study, we enrolled adolescents aged 10 to 19 years routinely diagnosed with bacteriologically confirmed pulmonary TB (PTB), between October 2020 and July 2021 in Cape Town, South Africa. Hand-held spirometry lung function measurements were completed at the start of treatment, and 2 and 8 weeks later according to ERS/ ATS guidelines. Global lung initiative (GLI) reference ranges were used to calculate z-scores.

Results
Of the 50 adolescents enrolled; 19 (38%) were male, mean age was 16.4 years (standard deviation 2.0). Thirty-six of the 39 (92%) chest-radiographs with typical TB disease showed adult type TB disease with cavitation. In total 18 (36%) were smokers, 5 (10%) were living with HIV and 9 (18%) reported a previous episode of TB. Forced expiratory volume in 1 second (FEV1) and Forced vital capacity (FVC) improved over time pre- and post-bronchodilation with salbutamol (Table 1), but remained below the -2 z-score. The FEV1/FVC ratio remained relatively normal over time.

Conclusions
Lung function in adolescents with PTB was well below normal reference ranges and indicate substantial restrictive impairment which improved during the early phase of TB treatment. Longer term follow-up of adolescents with PTB is important to assess the long-term impact of PTB on lung function and recovery and to correlate these findings with residual symptoms, quality of life, imaging and functional assessments.

Abstract 85

CHALLENGES OF CONDUCTING CLINICAL RESEARCH IN LOW-MIDDLE INCOME COUNTRIES: Reflections on research field experiences from Cape Town, South Africa

Margaret Van Niekerk[1], Michaile Anthony[1], Dr Isabelle Dewandel[1], Professor Marieke Van Der Zalm[1]
[1]*Stellenbosch University, Department of Paediatrics and Child Health, Cape Town, South Africa*

Biography:
Margaret van Niekerk is a project manager and has a Master's degree in Human Nutrition. She has over 10 year's experience in TB/ HIV research management and implementation. She works at the Desmond Tutu TB Centre, Stellenbosch University.

Background
There is an increased awareness about the need to have a global representation in research.Research and funding inequalities remain between low-middle-income-countries(LMICs)and high-middle-income-countries(HMICs).Understanding research challenges in LMICs like South Africa(SA)is important to address inequalities and produce high quality research outputs.We will focus on clinical tuberculosis(TB)research experiences from the field conducted in Cape Town,SA.

Methods
We conducted a focus group with12 health workers(research counsellors, drivers and nurses)on their experiences from an ongoing prospective observational paediatric cohort since November 2017 (Umoya study)of children 0-13-years-old with respiratory symptoms presumptive of pulmonary TB. Topics included challenges related to socioeconomic contexts, recruitment and retention.Thematic analysis was used to organise their experiences.

Results
We found three operational research challenges a)recruitment, b)retention and c)socioeconomic aspects.Recruitment was found to be challenging due to language barriers,caregiver accessibility (e.g.,hospital discharge,no longer existing mobile numbers,informal suburbs without house numbers),traditional and cultural beliefs about the child's health.Challenges related to consenting include the lack of caregivers' identification documents and illiteracy of caregivers.Social dynamics and socioeconomic context of participants are complex e.g.,household overcrowding with high risk transmission of infectious diseases like TB and COVID-19.Majority of families are dependent on social grants to survive.The SARS-CoV2 pandemic has caused additional difficulties in conducting research in LMICs due to preventative measures, such as social distancing, leading to staggering visits, affecting the resources needed,including increased number of drivers and specific vehicles. Moreover,lockdown restrictions caused additional constraints on healthcare systems with negative impact on retention and continuation of care.

Conclusion
There are specific challenges related to paediatric TB research in SA.Understanding setting and socio-economic context is important to overcome this,including additional costs due to increased resource use.Conducting successful research and herewith improving child health, implicate balance between challenges and benefits for future research funding in LMICs. Funding organizations should take these aspects into account in order to globalize research.

Abstract 86

ENDOSCOPIC FINDINGS IN CHILDREN BORN WITH OESOPHAGEAL ATRESIA.

Dr Corne De Vos[1,2]
[1]*Stellenbosch University, , South Africa,* [2]*Tygerberg Hospital, Cape Town, South Africa*

Biography:
I am a consultant Paediatric Surgeon working at Tygerberg Hospital since 2016. I am busy with my PhD in Paediatrics and Child Health looking at a bio-psycho-social follow-up model for children born with oesophageal atresia and their families. Other interests include: multi-disciplinary team approaches to complicated diseases and neonatal surgery.

Introduction
Oesophageal atresia (OA) is one of the commonest congenital gastro-intestinal (GI) abnormalities. Due to advances in multi-disciplinary care, early prognosis has improved with emphasis shifting to the long-term impact of this disease.

Literature suggests a higher incidence of Barrett's and eosinophilic oesophagitis in these children, with long-term follow-up studies also showing an increased risk of oesophageal carcinoma. Despite this, uncertainty remains regarding the necessity and frequency of endoscopic surveillance for these children.

We describe our endoscopic findings and discuss the literature surrounding some of these controversies.

Method
A prospective analytic cohort study was undertaken that included all children post OA repair. History regarding the child's feeding and GI symptoms were documented and an endoscopy was performed if it was clinically indicated.

Results
During the study period (2020 – 2022), twenty-six endoscopies were performed for children post OA repair at a median age of 2 years.

Feeding history was obtained in 77% of the cases. Fifty percent reported that they take longer to finish feeds, 40% refused to finish feeds, 35% of cases coughed or choked sometimes during feeds and 35% vomited during or after a feed.

The commonest clinical appearance on endoscopy was anastomotic strictures (58 %) followed by oesophagitis (19%), gastritis (8%), fungal infection (8%) and a diverticulum (15%).

Six biopsies were taken at the time of endoscopy, with abnormal histology in all but one patient. No complications were reported.

Conclusion
This study confirmed that all patients with a clinical indication for an endoscopy had had abnormal clinical or histological findings, thus concurring with the literature in highlighting the need for regular endoscopy.

We recommend regular clinical follow-up and endoscopic surveillance in children with persistent GI symptoms, respiratory symptoms or failure to thrive despite adequate nutritional support.

Abstract 87

The health systems impact of COVID-19 on children with tuberculous meningitis through the lens of health care workers

Miss Dzunisani Baloyi[1], Dr Graeme Hoddinott[1], Ms Hanlie Myburgh[1], Mr Dillon Wademan[1], Prof Anneke Hesseling[1], Dr Karen Du Preez[1]

[1]*Desmond Tutu TB Centre, Stellenbosch University , Cape Town, Parow Valley, Francie Van Zijl Drive, South Africa*

Biography:

Miss Dzunisani Baloyi has completed an MSc Research Psychology and intends to register for PhD in Paediatrics and Child Health. She is a registered research psychologist with the Health Professions Council of South Africa. Since joining Desmond Tutu TB Centre in 2019, she has supported several projects at the Desmond Tutu TB Centre and is currently the lead social scientist for the Care4TBMkids study.

The impact of COVID-19 on health care services for other disease programmes such as tuberculosis (TB) in low- and middle-income countries has been substantial, with an increase in TB deaths for the first time in 10 years. TB meningitis (TBM) is the most severe and debilitating form of TB in children. Early diagnosis is an important predictor of outcome but requires well-functioning health systems.

To describe health care workers' (HCWs) perspectives on the health systems impacts of COVID-19 on children with TBM in Cape Town, South Africa. We conducted observations at hospitals (n = 2) and primary health care (PHC) facilities (n=8) and interviewed HCWs (n=17) working at these facilities. We conducted a pragmatic case descriptive analysis.

Participants said that the COVID-19 pandemic had a negative impact or disrupted general health systems functioning at hospital and PHC facilities in the Cape Town, South Africa. This impact was associated with limited access to PHC services due to COVID-19 related lockdowns and restrictions, reprioritization of resources towards the COVID-19 care pathway and missed opportunities to diagnose TB/related disease (including TBM meningitis). The pandemic compounded existing health systems challenges for the prevention, diagnosis, and treatment of children with TBM. Identified barriers to access care included additional delays in recognizing and prioritizing TBM symptoms by HCWs and caregivers, reduced health services access due to reduced staff capacity, reduced post-hospitalization follow-up and care options, and challenging socio-economic circumstances for TBM patients and their families which were compounded by COVID-19.

The COVID-19 pandemic increased existing inefficiencies in TBM health systems and compounded socioeconomic challenges for affected families. Mitigating this negative impact will require raising awareness about TBM in children amongst HCWs and families with young children, and re-establishing child health and TB services, including TB prevention services, that were interrupted because of the COVID-19 pandemic.

Abstract 88

Short term outcomes of South African children with Multisystem Inflammatory Syndrome in Children (MIS-C): a prospective cohort study

Dr Juanita Lishman[1], Prof Helena Rabie[2], Dr Deepthi Abrahams[3]
[1]Stellenbosch University, Cape Town , South Africa , [2]Stellenbosch University , Cape Town , South Africa , [3]Stellenbosch University , Cape Town , South Africa

Biography:
Juanita Lishman is a paediatrician doing a fellowship in paediatric infectious diseases at Tygerberg Hospital in Cape Town. She completed her undergraduate studies at the University of Cape Town and specialized as paediatrician at Stellenbosch University.

Background:
Despite the life-threatening presentation of MISC in children, the overall prognosis is reported to be favourable in first world centers. In this study we aimed to investigate the short-term outcomes in children with MIS-C in Cape Town, South Africa.
Methods:
This observational prospective cohort study included children <13 years who fulfilled the World Health Organization (WHO) case definition of MIS-C and were admitted to Tygerberg Hospital (Cape Town, South Africa) between 1 June 2020 and 31 October 2021. Clinical features were recorded at baseline and at follow-up at 6-week cardiology clinic and 3-month rheumatology-immunology clinic.
Findings:
Fifty-three children were included. The median age was 7,4 years (interquartile range (IQR) 4,2-9,9). Most of the patients were male (30/53; 56,6%) and the majority was of mixed race ancestry (28/53; 53,3%) or black African (24/53; 45,3%). Eleven children (11/53; 20,7%) had co-morbid disease. The median length of hospital stay was 8 days (IQR 6-10). All patients had an echocardiogram performed at baseline of which 39 were abnormal (39/53; 73,6%). The majority had elevated markers of inflammation, lymphopenia, anaemia, renal impairment, hyponatremia, and elevated cardiac enzymes during the acute phase. All patients were discharged alive. Eleven patients (11/41; 26,8%) had a persistently abnormal echocardiogram at cardiology follow-up. Systemic inflammation and organ dysfunction resolved in most patients during follow-up.
Interpretation:
The short-term outcomes of MIS-C in children in our cohort were generally good, with no deaths reported, however the cardiac morbidity was high and needs further characterization to inform targeted interventions such as vaccine availability for children.

Abstract 89

Uterine balloon volume shifts using a free-flow uterine balloon in the management of refractory post-partum haemorrhage

Dr. Tasleem Hassim[1]

[1]Prof GB Theron, cape town, South Africa, [2]Eduard Langenegger, cape town, South Africa, [3]Prof Martin Kidd, cape town, South Africa

Biography:

MBCHB Stellenbosch University (2014)

Current- Senior Registra Obstetrics and Gynaecology- Stellenbosch University

Obstetric haemorrhage is the third most common cause of maternal death in South Africa. Intra uterine balloon tamponade (UBT) is part of the post-partum haemorrhage (PPH) protocol. The mechanism of action of UBT is the application of pressure against the bleeding sinusoids in the placental implantation site. If the pressure inside the uterus corresponds to the patient's systolic blood pressure, a tamponade effect is created. A free-flow balloon allows intra-uterine pressure control by adjusting the height of the supply bag above the patient.

This study was undertaken to evaluate the volume differences in the supply bag of the free-flow Ellavi UBT.

Methods:

The study population included consecutive patients with refractory PPH managed in the obstetrical critical care unit (OCCU) at Tygerberg Hospital.

Patients presenting with refractory PPH following implementation of emergency resuscitative measures and with the Ellavi UBT inserted were recruited. Group A had the supply bag weighed every 30 minutes with a sensitive digital scale, to measure the amount of fluid in the supply bag. Group B additionally had the supply bag lowered by 50% every 30 minutes and the uterus gently rubbed for 30 seconds to allow the water to be expelled back to the supply bag.

Experience:

The study confirmed that water is expelled back from the uterine balloon (UB) to the supply bag in the free flow system. The mean volumes reflected in Group A 23.7ml and Group B 132.7ml. The difference comparing all highest and lowest volumes, confirmed that more water was expelled in Group B. The difference was borderline significant (p=0.60).

The study supports the timely intervention with UBT in cases of refractory PPH. Lowering the supply bag at 30-minute intervals enhances the physiological process of contraction and retraction of the myometrium, a process that is essential to arrest PPH.

Theme 7 – Health Professions Education / Tema 7 – Gesondheidsberoepe Onderwys

Abstract 90

Experiences using videos to complement structured oral examinations in Surgery.

Professor Karin Baatjes[1], Dr Jenny Edge[1], Dr Ilna Conradie[1], Associate Professor Elize Archer[1]
[1]*Stellenbosch University, Parow, South Africa*

Biography:
Dr Edge is a breast surgeon based in the Division General Surgery, SU. She returned to academic medicine in 2018, having been in private practice in Cape Town for the preceding 18 years.

She completed her undergraduate training at UCL. She came to SU in 1994 and trained as a general surgeon obtaining FRCS from Edinburgh and MMed from SU. After her return to academia in 2018, she completed a Leadership course at Harvard University.

She founded the Breast Course for Nurses in 2010 and the specialist Breast Care Course in 2019. Over 700 nurses have completed the training.

Introduction
Surgeons require multiple skills to be considered competent. Varied assessment strategies are vital in the evaluation of knowledge, analysis, and technical expertise. The oral examination is the standard to test knowledge and clinical reasoning, but reliability and validity concerns remain. Providing structure to orals may facilitate the measurement of achievement of course outcomes and the use of mock assessments can assist trainees in preparing for exit examinations. This study explored the experiences of surgical trainees and examiners using a video-assisted, procedure-based, structured oral examination (SOE) in face-to-face and virtual format.
Methods
This descriptive study at the Division of Surgery at Stellenbosch University, Tygerberg Academic Hospital, Cape Town, South Africa, took a case-based SOE format using procedural videos. One group of registrars had face-to-face contact with the examiner, and the other group was assessed on an online platform, e.g., Microsoft Teams™, where the examiner was remote. After the SOE, a focus group interview was held with the surgery trainees and individual interviews with the examiners, generating qualitative data.
Results:
Themes were developed from the interview transcripts. These themes centre around the utility of videos in this examination format and technical issues during the SOE, e.g., the connectivity and audio-visual disturbances. Further themes revolved around the standardization of questions and preparation of the examiners.
Conclusion:
Overall engagement by both the registrars and the examiners was high, and procedural videos as part of the mock SOE was experienced as valuable. The addition of video recordings to the online platform posed administrative and technical challenges. Suggestions emphasized the importance of standardized approaches and better examiner preparation. Examiners requested training and guidelines on examination practice. Future efforts should focus on the standardization of the examination format, optimizing technical issues, and improving examiner preparation.

Abstract 91

Exploring the perceptions of physiotherapy students on their preparedness to include exercise in the treatment of cancer patients.

Mrs Leone Williams[1], Prof Susan Van Schalkwyk
[1]*Stellenbosch University , Po Box 241, Cape Town , South Africa*

Biography:
Leone Williams is a Senior Lecturer in the Division of Physiotherapy. Her focus areas of interest and teaching is orthopaedics, cancer rehabilitation and ergonomics. Leone has a passion for teaching and learning in health professions' sciences.

Background
Undergraduate health professions curricula should equip students with the requisite knowledge, skills and attitudes to manage patients within their local communities. Given the increasing incidence of cancer in South Africa, it could be argued that responsive curricula should include cancer-related content.
Objectives
This study aimed to explore the perceptions of undergraduate physiotherapy students at Stellenbosch University regarding their preparedness to include exercise in the management of cancer patients.
Method
A qualitative research design was used. Purposive sampling was employed to recruit fourth year physiotherapy students with exposure to the management of cancer patients. Focus groups were used for data collection, using a semi-structured interview guide. Thirteen students provided written informed consent to participate in the study. Ethical approval was obtained to conduct this study.
Results
Four themes were identified namely: i) students' perspectives of cancer; ii) students' knowledge of cancer in the context of physiotherapy; iii) students' response to providing treatment; and iv) students' perspectives on the implications for the curriculum. Physiotherapy students reported limited knowledge of cancer and expressed uncertainty about their role in the management of cancer patients. Students were perplexed by the use of exercise for cancer patients. Students reported an array of distressing emotions during the management of cancer patients, with no reports of debriefing mechanisms.
Conclusion
The study findings highlight the interplay between the study participants' learning needs and their identity development as physiotherapists during the management of cancer patients. Study participants suggested that the curriculum could better prepare them for the management of cancer patients by creating opportunities for them to learn through collaboration, exposure to cancer patients and community of practice.
Clinical Implications
Curriculum developers should reconsider foci and time allocation to better prepare undergraduate physiotherapy students to manage cancer patients.

Abstract 92

Towards understanding the use of digital anatomy learning platforms - preliminary findings

Mr Jaudon Foiret[1], Dr Mariette Volschenk[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Mr Jaudon Foiret is a member of the LT team at the CHPE in the FMHS at SU. He has obtained an M.Sc and has experience in lecturing to medicine and health sciences students as well as in the design of the anatomy curriculum. His current focus areas include learning experience design and advising subject matter experts and curriculum designers on online course design. Additionally, he supports the use of external content and communication platforms in the FMHS to promote lecturer-directed student learning. He conceptualizes and designs online learning material for and in collaboration with academics of the FMHS.

Digital anatomy learning platforms have been available for many decades and are growing in sophistication. These platforms provide an additional tool and in some cases an alternative to traditional dissection-based teaching methods. Although these systems have existed there is paucity in the literature regarding the way students use these platforms in their own learning. This paucity is exacerbated when one seeks to understand the use of such platforms in low- and middle-income countries such as South Africa. In these countries individuals need to be cognisant of socio-economic factors that can hinder the use of digital platforms.
The conversational framework is student centred approach to describing how students engage with their own learning as a conversation between the student, the lecturers, their (physical and or digital) environment and their peers. This framework can assist in describing the students engagement with the platform and how it
This presentation aims to explore the literature relating to the use of digital learning platforms and its impact on student learning, with a specific focus on low- and middle-income countries. Additionally, I will present preliminary findings from my study exploring the experience of second-year medical students in the use of anatomical learning software and its impact on their learning strategies.
Phase 1 of this study employed a whole population sampling of the second-year medical student cohort (n=296) to understand the device and network limitations and self-reported platform usage. Purposive sampling was used to identify individuals based on their usage of the platform and invite them to participate in a focus group discussion to explore how they used the platform in their learnings.
The findings from the literature and research presented may potentially assist in providing guidance in the development of staff development and student support initiatives to assist in the use of digital platforms.

Abstract 93

Facilitators perceptions of learning in the clinical environment

Mrs Anna Schmutz[1,2], Dr Alison Lupton-Smith[2], Dr Rhoda Meyer[1], Prof Elize Archer[1]
[1]Centre for Health Professions Education, Cape Town, South Africa, [2]Division of Physiotherapy, Cape Town, South Africa

Biography:
I am a full-time lecturer at the Division of Physiotherapy, as well as at the Centre for Health Professions Education at SU. I graduated as physiotherapist from SU in 1997 and obtained my MPhil in HPE (SU) in 2017. I am involved in both UG and PG teaching and am currently the clinical coordinator for the final year physiotherapy students. My research interest/domain is in the development of the clinical training platform as well as in the development of both clinical educators and students. My current research focuses on the role of feedback on learning in the clinical context.

Health professions education (HPE) is the field of expertise applied to the education of health care providers. HPE is in a state of constant change in response to changing health care needs, and with a focus on nurturing highly adaptable graduates (Frenk et al., 2010). The need for adaptability stems from the recognition that HPE learners need to be competent within a diversity of healthcare settings. These demands, requires graduates who are able to be metacognitively aware of their own learning.
As part of a larger study exploring what are learners' and facilitators' perceptions and experiences of learning in the clinical environment, this abstract focusses on how facilitators perceive learning and their role in learning in the clinical environment. These perceptions were explored with the purpose of informing future strategies to improve learning.
A qualitative methodology within an interpretive paradigm was used. Convenience sampling was undertaken, where fourth-year physiotherapy clinical facilitators from Stellenbosch University were invited to participate. Data was generated by seven semi-structured interviews. The data was analysed through thematic analysis using Atlas.ti. The preliminary findings from interviews with physiotherapy facilitators are presented.
Preliminary themes were identified, namely: learning is a social activity, learning is about taking ownership, and the environment plays a fundamental role in learning. These themes reflect the facilitators' understanding of learning as well as how they see their role in facilitating learning.
The identified preliminary themes in this study will be further explored in conjunction with the perceptions of learners. This study may offer some recommendations for faculty development initiatives to assist facilitators in improving their facilitation of learning in the clinical environment.

Abstract 94

Exposure to paediatric end-of-life care: The experiences and coping strategies of paediatric registrars in South Africa

Dr Audrey Sullivan[1], Prof Sharon Kling, Prof Mariana Kruger
[1]*Stellenbosch University, ,*

Biography:
Audrey Sullivan is a registrar in the Department of Paediatrics and Child Health. Before medicine, she was a pharmacist, and has had a student card for longer than she cares to mention. She is passionate about paediatric palliative care and physician wellness. When she is not at work, she is running a zoo, with 2 busy boys, 4 rescue dogs and a very patient husband.

Introduction: The provision of end-of-life care and experience of the death of a paediatric patient is challenging.

This study aimed to document the experiences of paediatric registrars in South Africa with regards to end-of-life care and death, including coping strategies and barriers.

Method: This was a cross sectional electronic survey completed by university registered paediatric registrars in South Africa from eight medical schools between March and June 2021. The BriefCOPE Tool was included to assess coping strategies; each subscale question scored between 1 and 4.

Results: One hundred-and-one of 320 paediatric registrars completed the survey (response rate 32%). Male to female ratio was 1:3.6 and median age 32 years. South African paediatric registrars had high exposure to paediatric deaths with a reported mean of 14 deaths per annum (range 2-50). Thirty-eight percent (37/98) of paediatric registrars did not feel prepared to cope with the death of a child, and 40% (39/96) had considered leaving paediatrics due to coping difficulties with paediatric death. There was no significant difference in perceived ability to cope with death comparing registrar demographics, experience, or prior training. Problem-focused and emotion-focused strategies scored equally (2.5), with avoidant strategies scoring lowest (1.7).
Acceptance scored highest (3.1), followed by religion (2.8) and self-distraction (2.8). Maladaptive coping strategies scores were low, namely substance abuse (1.2) and denial (1.1). Debriefing was inconsistently available. Most participants (97%) deemed holistic paediatric end-of-life care training valuable.

Conclusion: South African paediatric registrars experience considerably more deaths than high income country counterparts - who typically experience less than 10 deaths over the course of their training. Paediatric training facilities should provide registrars with formal training to improve end-of-life care for paediatric patients and ensure adequate support to protect the registrars' mental wellbeing.

Abstract 95

Exploring the use of Standardised Tests and Non-Standardised Testing Methods used by Occupational Therapists working with Children in a South African Context

Ms Inge Kuchar[1], Ms Anzel Pauw[2], Ms Nicole Moss[3], Ms Serlisha Koseelan[4], Mrs Arifa Sheik-Ismail[5]
[1]Stellenbosch University, Parow, South Africa, [2]Stellenbosch University, Parow, South Africa, [3]Stellenbosch University, Parow, South Africa, [4]Stellenbosch University, Parow, South Africa, [5]Stellenbosch University, Parow, South Africa

Biography:
In partial fulfillment of the fourth year of their B Occupational Therapy degree, Inge Kuchar, Anzel Pauw, Nicole Moss, and Serlisha Koseelan conducted this research study under the supervision of Mrs Arifa Sheik-Ismail.

Background:
Successful occupational therapy (OT) intervention starts with comprehensive assessment by means of various measurement instruments. There is paucity in the available research that relates to assessment methods used by occupational therapists (OTs) working with children in South Africa.

Objectives:
To identify:
- The standardised tests and non-standardised testing methods most/least commonly and frequently used and the reasons for the use thereof.
- The criteria used for selecting specific tests.
- Trends in the use of standardised tests in various sectors of South Africa.
- The suitability of standardised tests in the South African context.

Methodology:
Convenience sampling was used to conduct this study. The data was collected by means of an electronic survey sent to OTs working with children in South Africa through using the OTASA, INSTOPP, and WCPPG databases.

Results:
From the results it has been observed that there is a preference for the use of standardised tests for the assessment of “perception and visual-motor skills”, and “sensory processing”. It was noted that there is a preference for the use of non-standardised testing methods for the assessment of “play”, and “fine- and gross-motor skills”. Most participants indicated that they do not use any testing method for the assessment of “leisure”. Finally, it was observed that there was a preference for a combination of standardised tests and non-standardised testing methods for the assessment of “learning and development”. Greater use of standardised tests in the private sector vs. in the public sector was noted.

Conclusion:
A large number of participants are making use of a combination both types of tests in order to ensure that assessment is holistic. However, there is an urgency for further research to be conducted on this topic to explore this phenomenon, with the goal of improving the effectiveness of assessment of children.

Abstract 96

A qualitative study: women's lived experience of training and working in orthopaedic surgery in South Africa

Dr Marí Thiart[1], Dr Megan O'Connor[2], Ms Jana Muller[3], Miss Nuhaa Holland[4], Professor Jason Bantjes[4]
[1]Division of Orthopaedic Surgery, Department of Surgical Sciences, Faculty of Medicine and Health Sciences, Tygerberg, Stellenbosch University, Cape Town , South Africa, [2]Department of Orthopaedic Surgery, Inkosi Albert Luthuli Central Hospital, School of Clinical Medicine, University of KwaZulu-Natal, Durban, South Africa, [3]Ukwanda Centre for Rural Health, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town , South Africa, [4]Institute for Life Course Health Research, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town , South Africa

Biography:
Dr Marí Thiart is a consultant orthopaedic surgeon, based at Tygerberg Hospital. She has a dual appointment as a senior lecturer at Stellenbosch University. She runs the Paediatric unit and has a special interest in bone and joint infections, cerebral palsy and limb reconstruction. She is one of the founding members of the South African Female Orthopaedic Surgeons' Society (SAFOSS). As one of the 5% of female orthopaedic surgeons in South Africa, Marí is passionate about advancing women and promoting Orthopaedics as a viable specialization option for women.

Background: Globally medicine is rapidly feminized, yet orthopaedic surgery in South Africa continues to be male dominated, with women currently constituting less than 5% of the profession. Reasons for the lack of gender transformation in orthopaedics are not well understood. We explored women's lived experience of training and working in orthopaedic surgery in South Africa, with the aim of understanding factors that may impede gender transformation in Orthopaedics.
Methods: This descriptive qualitative study was grounded in phenomenology and followed a data-driven inductive approach. Data were collected via facilitated informal focus groups, in which discussion was directed at understanding both the collective and individual experiences of the participants and analysed using thematic content analysis.
Results: Participants describe working in a dynamic environment which is being visibly transformed, yet they identified several practices which contributed to their experience of thwarted belonging. They described the additional labour imposed by their active participation in disrupting the established gender order and how the labour of this transformative work was not always seen or acknowledged by male colleagues. They described the challenge of negotiating the competing roles of mother and surgeon and how this contributed to feeling alienated. They described incessantly confronting restrictive gender norms and their experience of internalised sexism which resulted in women perpetuating gender discrimination. Participants described how they resisted the restrictive hegemony and pushed back against marginalisation. Finally, they identified strategies that could be helpful to promote transformation.
Conclusion: The gender imbalance in orthopaedic surgery is a function of broader historic and socio-cultural factors in South Africa including traditional gender norms and expectations. Nonetheless, both men and women contribute to reproducing a culture which hinders gender diversity. Men and women have an important role to play in promoting gender inclusion and diversity in orthopaedic surgery in South Africa.

Abstract 97

‘It’s all about the patients’: medical students’ reflections on a novel 12-week integrated rotation.

Prof Susan Van Schalkwyk[1], Prof Ian Couper, Dr Therese Fish, Prof Julia Blitz, Dr Kobus Viljoen, Dr Lune Smith
[1]*Faculty Of Medicine And Health Sciences, ,*

Biography:
Susan van Schalkwyk, M Phil, PhD., is Professor and Director of the Centre for Health Professions Education in the Faculty of Medicine and Health Sciences at SU. She has more than 17 years’ experience in academic staff development, with a research focus on doctoral education, and developing academic writing. Susan is a B-rated researcher with the NRF, SU Teaching Fellow, and Fellow of the international Association of Medical Educationalists (AMEE). She serves on the editorial boards of the AJHPE, Medical Education and Advances in Health Sciences Education and has authored or co-authored more than 80 peer-reviewed articles and book chapters.

Background
Student training could not continue as planned in 2020 due to the lockdown as well as the prioritisation of tertiary hospitals to manage COVID-related illnesses. This necessitated swift, innovative curriculum amendments to enable late phase students at Stellenbosch University to fulfil their clinical commitments. The Integrated Distributed Engagement to Advance Learning (IDEAL) rotation was developed in response, placing 252 students for 12 weeks in 18 different health sub-districts, both urban and rural health facilities outside of Tygerberg hospital. The rotation focused on integrated clinical learning through service, with on-site supervision by local clinicians. A number of educational innovations characterised IDEAL's development.
Methods
An evaluation was conducted using mixed methods, based on principles of the Educational Design Research (EDR) approach. As part of that research, three focus groups and two individual interviews were conducted with twelve 6th year students who completed the IDEAL rotation during 2020, about 6 months after completion of the rotation. These used a semi-structured interview guide to explore student perceptions of their learning and growth as a result of IDEAL. Verbatim transcriptions were used for team-based interpretation of themes identified through content analysis.
Results
Students’ responses coalesced around six distinct themes that illuminated different aspects of the IDEAL experience. The reflections described IDEAL as a learning experience that was (1) enabling, (2) humanising, (3) collegial, (4) variable, (5) and different, as well as (6) a personal learning journey.
Conclusions
This study highlights a learning experience that was pedagogically enriching on both an inter- and intra-personal level. The patient is seen as a central focus of this learning, which enabled a sense of autonomy and fueled a growth in student confidence. Most striking in the responses was the many references to how IDEAL had changed students’ thinking and perspectives about healthcare, and their role in it.

Abstract 98

Medical teachers navigating their identity in the context of major curriculum reform

Dr Mariette Volschenk[1], Mrs Anthea Hansen[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Mariette Volschenk is a lecturer at the Centre of Health Professions Education in the Faculty of Medicine and Health Sciences at Stellenbosch University. She also manages the learning technologies portfolio. Mariette is a co-researcher on the national, multi-site responsive curricula project at Stellenbosch University. Other research interests include technology mediated education, learning experience design (LxD), identity learning and postgraduate supervision. Her recently completed doctoral studies focused on the identity trajectories of health professions educators involved in master's level health professions education studies. Mariette is a keen lifestyle photographer in her spare time.

Introduction
Global calls for 21st century healthcare to be more responsive to societal health needs and inequities have catalysed new ways of thinking in medical education. Increasingly, undergraduate medical curricula are transitioning to competency-based education, while some are adopting critical pedagogical approaches. Reconceptualising curricula at this level demands that medical teachers move beyond modifying their teaching syllabi towards deeper engagement with the fundamental epistemological and ontological principles shaping curriculum renewal.

Aim/Objective
This paper draws its data from a qualitative study that explored the range of understandings that health professions educators bring to teaching as they interpret the non-traditional principles underpinning their renewed curricula. We explore the implications of these understandings for the identity construction of medical teachers involved in undergraduate medical curricular reform.

Methods
Qualitative data were generated using focus groups and interviews with twenty-six purposively selected medical teachers at a South African university. Data were coded inductively and analysed thematically.

Findings
Medical teachers' interpretation of what curriculum changes mean for their teaching, and their perceived capacity to implement the new underpinning curriculum philosophy, were influenced by identities that were constructed within the boundaries of the traditional curriculum. Drawing on landscapes of practice theory and identity learning models, this paper offers insights into the identity tensions experienced by medical teachers as they navigate between primary professional identities rooted in the health professions and those of educator and curriculum designer.

Conclusion
21st Century educational reform requires medical teachers to straddle the boundaries of diverse practice communities. In these liminal spaces, they are challenged with making sense of, and translating alternative knowledge forms into teaching practices. Institutional change management strategies to facilitate curriculum renewal should include a focus on identity learning, boundary-crossing competencies and creating spaces for dialogue to support the ongoing identity construction of medical teachers traversing the changing educational landscape.

Abstract 99

Student-perceived value on the use of clay modelling in undergraduate clinical anatomy at Stellenbosch University.

Mrs Janine Correia[1], Prof Karin Baatjes[2], Mrs Ilse Meyer[3]
[1]Division of Clinical Anatomy, Faculty of Medicine and Health Sciences, Stellenbosch University, Parow, South Africa, [2]Dean's Division, Faculty of Medicine and Health Sciences, Stellenbosch University, Parow, South Africa, [3]Centre for Health Professions Education, Faculty of Medicine and Health Sciences, Stellenbosch University, Parow, South Africa

Biography:
Janine Correia is appointed as a senior lecturer in the Division of Clinical Anatomy. She holds a Masters in Medical Sciences with a specialization in Human Anatomy and Cell Morphology, University of the Free State, and a Masters (MPhil) in Health Professions Education, Stellenbosch University. Janine's research interests rest within the anatomical sciences, anatomical sciences education, and the historical aspects of anatomy and medicine. She has a long-standing interest in matters related to the value and risk associated with cadaveric dissection in medical education.

Clay modelling (CM) is increasingly used as an anatomy teaching method to supplement practical sessions. The use of CM is an active, tactile learning tool utilized to improve student engagement and enhance students' understanding of anatomical relationships in human anatomy. Furthermore, not only does CM engage more senses in the learning process, but it was also found that there are educational advantages to the group interactions that are associated with the construction process to further collaborative learning.

Thus, the aim was to explore the effect of building anatomical clay models on students' awareness and understanding of their own thought processes as well as to explore whether CM promoted collaborative learning. This cross-sectional study entailed the use of CM and reflective practice to promote metacognition in third-year BSc students. The students were asked to build anatomical clay models (in groups), and complete a reflective assignment and an evaluation form as part of their assessment. The reflective assignment was based on Gibb's reflective cycle. The inclusion of such an assignment would trigger students to reflect upon their learning experiences and thus promote their metacognition.

Ten students volunteered to take part in the study. A mixed method approach was followed; the reflective assignments were qualitatively analyzed, while the evaluation forms were quantitatively analyzed. Data obtained from the online evaluation forms indicated agreeable responses confirming that CM was a valuable learning tool. However, the participants preferred cadaveric dissection instead of CM to learn anatomy. Furthermore, three themes became prominent from the thematic analysis of the reflective assignments, namely, 1) Advantages of CM, 2) Challenges of CM and 3) Suggestions for future practice.

The research suggests that the inclusion of the hands-on CM in undergraduate clinical anatomy is a valuable learning tool. The participants perceived that it enhanced their anatomical knowledge and improved collaborative learning.

Abstract 100

Sex as a spectrum: Inclusive anatomical education and the translation thereof into clinical practice

Mr Ruan Lochner[1]

[1]*Stellenbosch University, Cape Town, South Africa*

Biography:

Final Year MSc student in the Division of Clinical Anatomy, Tygerberg Medical Campus. Passionate about mental health and public health related research. I have collaborated with Genderdynamic NGO in order to make my current research possible and intern as a research assistant at waves for change, which does surf therapy with underprivileged children.

People on the gender spectrum globally face systemic barriers that prevent them from accessing healthcare. Discriminatory healthcare environments result in transgender and non-binary people ultimately avoiding healthcare environments and resort to self-medicating and self-performed surgeries. Furthermore, transgender and non-binary people also seek healthcare that is not only affirming or related to medical transitioning. Therefore, healthcare environments should do more to be inclusive of all people seeking healthcare, especially those of marginalized backgrounds. Štrakjl & Pather, (2020) studied a recent review article claiming that anatomical sciences could be a non-invasive intervention and cost-effective way of including more transgender and non-binary terminology into the medical program. Data was collected in three parts. A mixed methodology cross-sectional survey was sent out to medical students, and anatomical science lecturers, tutors and practical assistants. The second phase of data collection was individual interviews with transgender and non-binary people, above 18 years of age, who has visited the healthcare system previously, in South Africa. Finally, a focus group was formulated from results obtained from the individual interviews and cross-sectional survey and six transgender and non-binary individuals participated. Tygerberg Medical Campus does not currently have enough resources offering knowledge of transgender and non-binary care. Students and staff express both negative and positive attitudes towards transgender and non-binary care. Transgender and non-binary people feel that current education is not sufficient enough to make healthcare environments accessible to the gender diverse community. Students, staff and members from the transgender and non-binary community would want to see more inclusion of gender diverse patients in the training of healthcare professionals and believe that studying fact-based information regarding the gender diverse community would improve healthcare environments for transgender and non-binary people.

Theme 8 - Mental Health and Neurosciences / Tema 8 – Geestesgesondheid en Neurowetenskappe

Abstract 101

Effect of brief coping skill training on alcohol use in high-risk student drinkers

Mrs Fatima Ahmed[1]

[1]*Stellenbosch University, Faculty Of Medicine And Health Science, South Africa*

Biography:

Originally from London, Fatima has made Cape Town her home and has a passion for neuroimaging research in the field of anxiety. Her skills range from processing scans on several different imaging modalities, including sMRI, fMRI and DTI, and her interest in learning new skills has allowed her to learn how to administer neurocognitive tests and learn new skills such as in VR, which is an ever growing area of research.

Background

Negative life events have been associated with an increase in alcohol use in adolescents. The hazardous levels of alcohol consumption in South Africa, especially in the Western Cape have been documented. Studies have demonstrated the high levels of alcohol dependence that can begin early in life. Given that research has shown older adults in South Africa have demonstrated moderate to high rates of risky drinking including high rates of binge drinking, it is therefore important that useful coping strategies are learnt from an early age to limit the effects of alcohol abuse later in life.

Methodology

Participants were 51 hazardous student drinkers who drink to cope with negative affect. Participants in the active group (n=25) were trained online over two weeks to respond to personalised negative drinking triggers by retrieving a personalised adaptive strategy they might use to mitigate negative affect. Participants in the control group (n=26) received standard risk information about binge drinking at university. Measures of daily drinking quantity, drinking motives, self-efficacy and use of protective behavioural strategies were obtained at baseline and four-week follow-up.

Results

Data analysis was carried out using SPSS version 27 to determine the difference between baseline and follow-up drinking habits between groups. There was a decrease in social and coping drinking motives and in depressive symptoms from baseline to four-week follow-up in the active intervention group, relative to the control group. Exploratory mediation analysis showed that the intervention effect on reduced coping drinking motives was achieved through reduced depressive symptoms.

Conclusion

These findings show that this online negative affect focused intervention can improve drinking-related outcomes in hazardous student drinkers in SA, potentially through increased resilience to negative affect. The findings support the utility of an intervention for substance use in low- and middle-income countries and over an extended follow-up period.

Abstract 102

Allostatic effects of PTSD and/or obesity affect dermal fibroblast characteristics

Mr Rohan Meerholz Benecke [1], Dr Mari Van Der Vyver[1], Prof Carine Smith[1]
[1]*Stellenbosch University, Tyrgerberg, South Africa*

Biography:
I am a physiologist currently focusing on mental health related aspects of stress and inflammation. I really love physiology, because it is a discipline where many complex systems interact. From the biochemistry of receptor signaling to the molecular biology of transcription, everything comes together in the physiological function of a cell, tissue, organ, organism.
My great passion is understanding the function of the brain and a career in neuroscience has allowed me to foster that passion.

Background: PTSD is a complex condition characterized by high risk for co-morbidities such as diabetes and cardiovascular disease. We hypothesized that PTSD may be characterized by allostatic load in the periphery that may be predictive of long-term health outcomes. Obesity is known to result in adverse redox-associated allostatic load and is therefore a good comparative condition for such an investigation.
Aim: We aimed to evaluate whether allostasis may be evident in functional characteristics of patient-derived primary dermal fibroblasts, obtained from patients with either PTSD and/or obesity, or neither.
Methods: Patient groups were divided into experimental groups according to the Clinician Administered Posttraumatic Stress Disorder Scale (CAPS) and body mass index (BMI). Primary dermal fibroblasts were cultured under standard conditions and their basal functional characteristics assessed. The expression of CD31, FNDC5, MMP-3 and MMP-9 (flow cytometry), calcium flux capacity (Fluo-4 microscopy assay) as well as the release of TIMP-2 and MMP-9 into the cell supernatants (ELISA) were determined.
Results: The allostatic effect of PTSD and/or obesity was evident with clear differences observed in fibroblasts-derived from specific patient groups compared to control. The most significant characteristics was a tendency for cell supernatant MMP-9 to be increased in Obesity, while PTSD exhibited a significantly lower proportion of fibroblasts expressing CD31 when compared to other groups. Furthermore, PTSD and PTSD+obesity fibroblasts exhibited significantly lower capacity for calcium flux.
Conclusion: PTSD results in a peripheral profile of allostasis in fibroblasts that are distinct from that seen for obesity.

Abstract 103

Neurological risk of prolonged low dose exposure to Imidacloprid elucidated in zebrafish

Dr Tracy Kellermann[1], Prof Carine Smith[1], **Miss Megan McCulloch[1]**
[1]Stellenbosch University, Cape Town, South Africa

Biography:
Second year MSc candidate in the Division of Clinical Pharmacology. Completed undergraduate degree in Human Physiology at the University of Pretoria, following by BScHons in Pharmacology at Stellenbosch University.

Background: Imidacloprid (IMI) is a systemic neonicotinoid insecticide intended to replace organophosphates in agriculture (1) (2). Extensive use of these pesticides increases risk to freshwater biodiversity due to potential bioaccumulation and toxicity (3). IMI may potentially have greater side effects on humans than originally anticipated based on binding affinity for human nicotinic receiptors(4).

Methods Zebrafish larvae were exposed to IMI at four and five days post fertilisation to determine the no observed adverse effect level (NOAEL) of IMI. Adult zebrafish were exposed to the NOAEL concentration for 21 days. Key endpoints included behaviour indicative of neurocognitive decline and possible bioaccumulation of IMI and its metabolites in adult zebrafish tissues. A protein precipitation extraction from zebrafish brain, liver and gill homogenate was applied followed by LC-MS/MS detection of neurotransmitters, IMI and its primary metabolites.

Results The NOAEL of IMI in zebrafish larvae was determined to be 2.5 µg/L. The calibration curve for the neurotransmitters fits a quadratic (weighted 1/C) regression over the concentration range of 31.25–1000 ng/mL for acetylcholine, gamma-aminobutyric acid, serotonin and dopamine. The calibration curve for IMI and its metabolites fits a quadratic (weighted 1/C) regression over the concentration range of 1.953-125 ng/mL for IMI and imidacloprid-urea, 0.244-125 ng/mL for desnitro-Imidacloprid and 3.906-125 ng/mL for 5-Hydro imidacloprid. These methods allowed for the detection of gamma-aminobutyric acid and acetylcholine in the treated brain samples. 5-hydro-IMI was detected at significantly high levels in the gills and liver tissue.

Conclusion Robust LC-MS/MS methods were developed for the quantitation of IMI, desnitro-imidacloprid, imidacloprid-urea and 5-hydro-imidacloprid, as well as serotonin, dopamine, acetylcholine and gamma-aminobutyric acid neurotransmitters in 200 µl zebrafish tissue homogenate. Together with the evaluation of bioaccumulation of imidacloprid and its metabolites in the brain and liver of zebrafish, this study provides indications of the impact on human health following chronic neonicotinoid exposure.

Abstract 104

The feasibility, acceptability and preliminary efficacy of a mental health self-management app in clinicians working during the COVID-19 pandemic: a pilot randomised controlled trial

Dr Katharine Kirykowicz[1], Dr Beth Jaworski[2], Dr Jason Owen[2], Professor Clemens Kirschbaum[3], Professor Soraya Seedat[1,4], Dr Leigh Van den Heuvel[1,4]

[1]Department of Psychiatry, Stellenbosch University, Cape Town, South Africa, [2]The United States Department of Veteran Affairs, , United States, [3]Department of Biopsychology, Dresden, Germany, [4]South African Medical Research Council/ Stellenbosch University Genomics of Brain Disorders Research Unit, Cape Town, South Africa

Biography:

Dr Katharine Kirykowicz obtained her undergraduate medical degree with honours from the University of Cape Town in 2014. She completed a postgraduate diploma in Mental Health in 2018 while working as a medical officer in Psychiatry at a district level hospital. She joined the Psychiatry registrar programme in August 2019.

Background: COVID-19 has affected health care systems globally and ultimately the physical and mental health of health care workers (HCWs). Appropriate and accessible interventions to support the mental health of these HCWs are needed. Mobile mental health interventions offer a possible wide reaching solution.

Methodology: We conducted a pilot randomised control trial with 34 clinicians working in government health care facilities in the Western Cape of South Africa. Participants were randomised in a 1:1 allocation to either a mental health app intervention (n=16) or a waitlisted group (n=18). After one-month, outcome self-report remote assessments were repeated and the waitlisted group then crossed over to the intervention for a month, following which they again completed outcome assessments. Feasibility was assessed with the Systems Usability Scale (SUS) and acceptability with the Client Satisfaction Questionnaire (CSQ). Additionally, efficacy outcomes were assessed through various mental health parameters between groups.

Results: The mean SUS score was 76.6 (SD=14.6, range 0-100) and the mean CSQ score was 21.9 (SD=3.9, range 8-32), with higher scores showing greater feasibility and acceptability. Anxiety scores decreased significantly from pre- to post-intervention (p=.036) as well as from baseline to 1 month follow up between the groups (p= .033), with greater improvement in the intervention group compared to waitlisted. Symptoms of acute stress disorder also showed a significant decrease from pre to post intervention (p=.011). The groups differed in resilience (p=.098) and patient related burnout (p=.098) from baseline to 1 month follow up, with a trend towards significance, with greater improvements in the intervention group.

Conclusion: Adequate feasibility and acceptability were shown, with time constraints identified as a barrier limiting app use. We demonstrated preliminary efficacy of the app, particularly on anxiety, acute stress, resilience and some aspects of burnout, findings which will need to be replicated in an adequately powered trial.

Abstract 105

Gut microbial alterations in Foetal Alcohol Spectrum Disorders

Natasha Kitchin[1], Dr Jacqueline S. Womersley[1], Mrs Andrea Engelbrecht[2], Mrs Anna-Susan Marais[2], Mrs Marlene M. de Vries[2], Prof Philip A. May[3], Prof Soraya Seedat[1], Prof Sian M. J. Hemmings[1]

[1]Department of Psychiatry, Stellenbosch University; South African Medical Research Council/Stellenbosch University Genomics of Brain Disorders Research Unit, Cape Town, South Africa, [2]Department of Psychiatry, Stellenbosch University, Cape Town, South Africa, [3]Department of Nutrition, Gillings School of Global Public Health, Nutrition Research Institute, University of North Carolina, Chapel Hill, USA

Biography:

Natasha is a PhD student in the Neuropsychiatric Genetics research group within the Department of Psychiatry. Natasha's research investigates the role that the maternal and infant gut microbiome, and the maternal vaginal microbiome, play in Foetal Alcohol Spectrum Disorders (FASD).

The prevalence of Foetal Alcohol Spectrum Disorders (FASD) in the Western Cape is up to 31%, significantly higher than the global prevalence of 0.77%. Alcohol consumption alters gut microbial composition and compromises the integrity of the intestinal barrier thereby allowing bacteria to enter the bloodstream, and in doing so, be transported to the foetus. Altered foetal bacterial colonisation may subsequently alter infant gut microbiota functioning resulting in increased risk of developing a neurodevelopmental disorder. This study therefore aimed to compare the gut microbial composition of both women who birthed infants diagnosed with and without FASD and that of infants diagnosed with and without FASD.

16S sequencing was performed on microbial DNA extracted from 207 maternal stool samples and 211 infant stool samples. Each infant was assessed for FASD by triangulating data from infant dysmorphology examinations, neurodevelopmental assessments, and maternal interviews. The dada2 pipeline, PhyloSeq and vegan were used to process the data, calculate diversity measures and compute the statistical analyses of microbial composition.

Ruminococcus was lower (q = 0.0298) in women with infants with FASD, while Alloprevotella was higher (q = 0.0426) in these women. Bifidobacteria was higher (q = 0.0316) in infants diagnosed with FASD. A lower abundance of Bifidobacteria has been observed in children with Autism Spectrum Disorder (ASD), making this finding unexpected. Both Megasphaera (q = 0.0260) and Prevotella (q = 0.0269) were higher in infants diagnosed with FASD, a finding that mirrors findings in individuals diagnosed with ASD in other low- and middle-income countries.

The microbial differences observed in this study may contribute to the neurocognitive deficits' characteristic of FASD. These findings are promising for microbe-based therapeutic interventions to reduce the extent of neurocognitive deficits and the debilitating symptoms associated with FASD.

Abstract 106

Youth engagement in mental health research: emergent lessons from a multi-country collaboration

Dr Christina Laurenzi[1], Prof Mark Tomlinson[1], A/Prof Sarah Skeen[1], Junita Henry[1], Chuma Busakhwe[1], Khotso Mokoena[1], Fredric Azariah[2], Matt Hughsam[3], Kevin Hale[3], Dr Moitreyee Sinha[3]
[1]Institute For Life Course Health Research, Tygerberg, South Africa, [2]citiesRISE, Chennai, India, [3]citiesRISE, New York, USA

Biography:
Christina Laurenzi is a Postdoctoral Researcher at the Institute for Life Course Health Research at Stellenbosch University in Tygerberg, South Africa. For this project, she led the South Africa research team. She is passionate about harnessing peer engagement in both research and programming spaces. Her work focuses on building evidence on interventions targeting adolescent mental health and maternal and child health. Christina is currently co-leading a project supporting psychosocial skills development among youth peer counselors who work with young women living with HIV in Zambia.

Over the last decade, youth participation and engagement have become increasingly widespread. This shift has been driven by young people's social right to participate in decision-making processes that affect their lives. Importantly, the strategies and formats for engaging youth vary tremendously, and few organizations have engaged youth around mental health and wellbeing. We describe emergent lessons from a multi-country research study, co-led by youth researchers and conducted in collaboration with citiesRISE, the Channels & Actors Project. This project aimed to learn about how youth engage with mental health science and how they make decisions about when, and from where, to seek support. Our presentation focuses on three emergent roles for youth in the research space: 1) youth as partners in knowledge generation, participating in research as key informants; 2) youth as researchers and implementers, leading research conceptualization, driving decisions, and co-developing protocols and research tools; and 3) youth embedded in advisory, advocacy, and leadership roles on a long-term continuum.

Abstract 107

Species-level profiling of the maternal vaginal bacteriome using 16S rRNA amplicon sequencing with application to Fetal Alcohol Spectrum Disorders

Miss Lauren Martin[1,3], Miss Natasha Kitchin[2,3], Mrs Anna-Susan Marais[2], Mrs Marlene de Vries[2], Prof Philip May[4], Prof Soraya Seedat[2,3], Prof Sian Hemmings[2,3]

[1]Stellenbosch University, Cape Town, South Africa, [2]Department of Psychiatry Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]South African Medical Research Council / Stellenbosch University Genomics of Brain Disorders Research Unit, Cape Town, South Africa, [4]Department of Nutrition, Gillings School of Global Public Health, University of North Carolina, , United States of America

Biography:

Lauren Martin is an MSc student in the Neuropsychiatric Genetics research group whose research aims to optimise the sequencing and assembly of 16S rRNA short-read libraries on the Illumina iSeq100. Her goal is to improve the species-level taxonomic resolution of bacterial communities present in the maternal vaginal microbiome of women who have given birth to infants with and without fetal alcohol spectrum disorders (FASD) to aid in determining whether associations exist between the underlying bacterial composition of the maternal vaginal environment and FASD development. Her research is supported by the SAMRC GBD unit, Harry Crossley Foundation, Illumina and NRF.

Affecting approximately 16-31% of children in the Western Cape of South Africa, Fetal Alcohol Spectrum Disorders (FASD) describes varying severities of physical, neurodevelopmental, and behavioural deficits associated with prenatal alcohol exposure. Exposure to vaginal microbes during delivery results in the acquisition of intestinal bacteria which, via the microbiome-gut-brain axis, have been found to play a significant role in neurodevelopment. Alcohol-associated vaginal microbial alterations may therefore increase FASD risk in infants.

Species-level classifications provide greater insight into bacterial dynamics in the microbiome. However, attainment of species-level resolution using on hand hypervariable sequencing is challenging as information is limited to regions of the 16S rRNA gene. This study, therefore, aims to perform species-level profiling of the maternal vaginal bacteriome of women who gave birth to infants with and without FASD through long- and short-read sequencing of the full-length 16S rRNA amplicon using the PacBio sequel II and the Illumina iSeq100 instrument, respectively.

A subset of pregnant women (n=28), recruited from antenatal clinics in the Western Cape of South Africa, provided vaginal swab samples on the day of birth. Alcohol use was assessed via self-reported AUDIT and FASD diagnoses in their infants were made by triangulating data from dysmorphology examinations, neurodevelopmental assessments, and maternal interviews. Microbial composition was assessed through long- and short-read sequencing of 16S rRNA amplicons. Following short-read sequencing on the iSeq100, libraries were assembled into full-length sequences using a custom pipeline. PacBio sequencing was performed to provide a reference for comparison. Microbiome-related bioinformatic, composition, and diversity analyses were performed using R packages, dada2, vegan and PhyloSeq.

We anticipate that full-length amplicon sequencing will improve the species-level taxonomic classification of bacteria and expand our understanding of the effects of alcohol consumption on the maternal vaginal bacteriome composition.

Results will determine if associations between the maternal vaginal bacteriome and FASD exist.

Abstract 108

Increased blood-derived mitochondrial DNA copy number in African ancestry individuals with Parkinson's disease

Dr Amica Müller-Nedebock[1], Ms Surita Meldau[2], Dr Carl Lombard[3], Dr Shameemah Abrahams[1], Prof Francois van der Westhuizen[4], Prof Soraya Bardien[1]

[1]Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Service (NHLS), Groote Schuur Hospital, Cape Town, South Africa, [3]Division of Epidemiology and Biostatistics, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [4]Human Metabolomics, North-West University, Potchefstroom, South Africa

Biography:
Currently a Postdoc in the Parkinson's Disease Research Group at Stellenbosch University.

Introduction
Altered levels of mitochondrial DNA copy number (mtDNA-CN) have been proposed as a proxy for mitochondrial dysfunction. Following reports of mtDNA depletion in the blood and substantia nigra of Parkinson's disease (PD) cases, mtDNA-CN was also suggested as a possible biomarker for PD. Therefore, this study aimed to investigate whether blood mtDNA-CN levels of African ancestry PD cases would be altered compared to controls, as previously reported in individuals of Asian and European ancestry.

Methods
Droplet digital polymerase chain reaction (ddPCR) was performed to quantify blood-derived mtDNA-CN levels as a ratio of a mitochondrial gene (MT-TL1) to a nuclear gene (B2M) in 72 PD cases and 79 controls of African ancestry (i.e. individuals with African mtDNA haplogroups) from South Africa. mtDNA-CN per cell was calculated by the formula 2 × MT-TL1/B2M.

Results
Accepting study limitations, we report significantly higher mtDNA-CN in whole blood of our PD cases compared to controls (median difference = 81 copies/cell), independent of age (95% CI [64, 98]; $P < 0.001$]). These findings contradict previous reports of mtDNA depletion in PD cases.

Conclusions
We caution that the observed differences in mtDNA-CN between the present and past studies may be a result of unaccounted-for factors and variability in study designs. Consequently, larger well-designed investigations may help determine whether mtDNA-CN is consistently altered in the blood of PD cases across different ancestries and whether it can serve as a viable biomarker for PD.

Abstract 109

Distress secondary to romantic relationship dissolution: Associated factors and attachment style as moderator

Alberta Van Der Watt[1], Prof Martin Kidd, Doctor Annerine Roos, Prof Elmien Lesch, Prof Soraya Seedat
[1]*Stellenbosch University (tygerberg Campus), Clinical Building, South Africa*

Biography:
Miss van der Watt completed her Masters in Psychology (by thesis) at Stellenbosch University. Since late 2015, she has been working as research assistant with the SARChI PTSD group under guidance of Prof Soraya Seedat. Currently, Miss van der Watt is a PhD candidate at the Department of Psychiatry with Prof Seedat as her main supervisor (co-supervised by Prof Elmien Lesch and Dr Annerine Roos). Her PhD focusses on PTSS following romantic relationship breakups, traumatic, and life events. The PhD includes online surveys and fMRI data.

Background: Romantic relationship dissolution (RRD) during emerging adulthood may lead to severe distress. Attachment style influences emotion regulation and coping with stressful events. Attachment style as moderator of breakup distress has not been explored.
Aim: First, the association of breakup distress with (i) the number of prior traumatic RRDs; (ii) relationship characteristics prior to the breakup; and (iii) breakup characteristics was investigated. Second, we investigated the moderating role of attachment style in these associations.
Method: Participants (n=886; female=70.1%; mean age=20.52 years) completed a demographic and relationship questionnaire, an attachment style measure, and the Breakup Distress Scale (BDS). Univariate tests were used to assess sociodemographic, relationship, and breakup variables associated with BDS scores. To assess for moderating effects, separate structural equation models, with BDS scores as the endogenous variable, were run for each attachment style (i.e., secure, anxious-ambivalent, avoidant).
Results: The mean BDS score was 33.73 (mode=32). Factors significantly associated with BDS scores included the number of prior traumatic RRDs, relationship characteristics prior to the breakup (e.g., perceived closeness), and breakup characteristics (e.g., initiator status and reason for the breakup). Secure, avoidant, and anxious-ambivalent attachment styles moderated the relationship between the aforementioned factors and breakup distress.
Conclusion: Non-marital RRDs are associated with significant distress in emerging adults, with high BDS scores compared to previous studies. Interventions should consider breakup characteristics, reasons for the breakup, and attachment style.

Theme 9 – Primary Healthcare / Tema 9 – Primêre Gesondheidsorg

Abstract 110

Adaptation and validation of the Ugandan primary care assessment tool (UG-PCAT)

Innocent Besigye[1,2], Prof. Robert Mash[2]
[1]*Makerere University, Po Box 7062, Kampala, Uganda,* [2]*Stellenbosch University, Cape Town, South Africa*

Biography:
Family Physician and Senior Lecturer at Makerere University. Currently a PhD Candidate at Stellenbosch University in the Faculty of Health Sciences under the supervision of Prof. Bob Mash.

Background: Health systems based on primary health care (PHC) have better outcomes at lower cost. Such health systems need regular performance assessment for quality improvement and maintenance. In many low and middle income countries, there are no electronic data databases for routine monitoring. There is need to have valid and reliable tools for use in regular measurement of PHC systems performance. This study aimed to adapt and validate the Primary Care Assessment Tool (PCAT) for the Ugandan context.
Methods: The study utilised a Delphi process using a panel of experts. The selection of the experts was based on their conceptual understanding of primary care and the Ugandan context. The ZA PCAT was emailed to 30 experts followed by 2 weekly telephone call reminders. The final panel of experts included 10 family physicians, 14 district health officers, 4 academics in primary care and 2 ministry of health technical staff who responded within 2 months. The same experts participated in the second round. The items for rephrasing, the added domain with its items were presented to the expert panel in round 2.
Results: Two rounds of Delphi were done with a panel of 20 experts.
Round 1: Four items in the comprehensiveness domain (services available) achieved consensus for removal and 5 items needed rephrasing. A new domain on person-centredness with 13 items was suggested for addition.
Round 2: The added domain with its items and the items for rephrasing all achieved consensus. The final Ugandan version of the PCAT has 12 domains and 91 items with additional 3 domains on primary care affiliation, self-health assessment and socio-demographic characteristics.
Conclusion: The ZA PCAT was adapted and validated to measure primary care performance for the Ugandan context and can now be used to measure the core functions of primary care in Uganda.

Abstract 111

Communication skills of general practitioners in Nairobi, Kenya: a descriptive observational study.

Dr Gulnaz Mohamoud[1,2], Professor Bob Mash[2]
[1]*Aga Khan University, Nairobi, Nairobi, Kenya,* [2]*Stellenbosch University, Cape Town, South Africa*

Biography:
DR GULNAZ MOHAMOUD M Med; PhD (FamMed)
Consultant Family Physician, Private Practitioner.
Senior Lecturer, Faculty, Researcher, Dissertation supervisor, Peer reviewer, Family Medicine resident mentor. Department of Family Medicine, Aga Khan University Nairobi, Kenya.

Gulnaz graduated from Dow University of Health Sciences (1987) and attained Masters and PhD in Family Medicine at University of Stellenbosch, South Africa. She has accreditations in Geriatric Care; HIV/TB/STD; Rehabilitation in Family Medicine with special interest in Geriatric Medicine and Ethics.
She has several published research initiatives, book reviews and is a peer reviewer of international journals. She is an examiner/dissertation supervisor for Family Medicine residents.

Abstract
Background: High- quality primary care needs to be person- centred, and GPs must communicate effectively to ensure continuity and coordination of care. In Kenya, there is little knowledge about the quality of communication in consultations by GPs.
Aim: To evaluate the quality of communication in consultations by GPs.
Design & setting: Descriptive, observational study of 23 GP consultations in 13 private sector primary care facilities in Nairobi, Kenya.
Method: One consultation with a randomly selected adult patient was recorded per GP, and 16 communication skills evaluated with the Stellenbosch University Observation Tool (SUOT). A total percentage score was calculated per consultation, and compared with the GPs' demographics and the consultation complexity and duration using the Statistical Package for Social Sciences (SPSS, version 25).
Results: The GPs' median age was 30.0 years (interquartile range [IQR] 29.0–32.0) and median consultation time was 7.0 minutes (IQR 3.0–9.0). Median overall score was 64.3% (IQR 48.4–75.7). GPs demonstrated skills in gathering information, making and explaining the diagnosis, and suggesting appropriate management. GPs did not make an appropriate introduction, explore the context or patients 'perspectives, allow shared decision making, or provide adequate safety netting. There was a positive correlation between the scores and duration of the consultations ($r = 0.680$; $P = 0.001$). The score was higher in consultations of moderate complexity (78.1, IQR 57.1–86.7) versus low complexity (52.2, IQR 45.1–66.6) ($P = 0.012$).
Conclusion: Consultations were brief and biomedical by young GPs. GPs need further training in communication skills, particularly with regard to delivering person- centred consultations. Deploying family physicians to the primary care setting would also improve the overall quality of service delivery

Abstract 112

Evaluating the implementation of the GREAT4Diabetes WhatsApp Chatbot to educate people with type 2 diabetes in Cape Town during the COVID-19 pandemic: Convergent mixed methods

Dr Darcelle Schouw[1], Prof Robert Mash[2], Mr Luke Fischer[3]
[1]University Of Stellenbosch, Cape Town, South Africa, [2]University of Stellenbosch, Cape Town, South Africa, [3]AVIRO Health, Cape Town, South Africa

Biography:
I am a registered Biokineticist, specializing in the prevention and control of risk factors associated with non-communicable chronic diseases. My experience includes doing research in implementation science, preventative medicine, chronic disease management, orthopedic rehabilitation, behavior change counselling and systems thinking. I am self- driven, creative, motivated, passionate, out of the box thinker and innovator. I have 21-year corporate experience and have success in developing a healthy choices at work program (HCWP), associated with clinically significant improvements in behavioral, metabolic and psychosocial risk factors for non- communicable diseases. I love rivers, and dark chocolate.

Abstract
Introduction
In SA, diabetes is a leading cause of morbidity and mortality, which was exacerbated during the COVID-19 pandemic. Most education and counselling was stopped during lockdown and the Great4Diabetes WhatsApp Chatbot was innovated to fill this gap.
Aim
To evaluate the implementation of the Chatbot in the Northern Tygerberg Substructure between May and October 2021.
Methods
Convergent mixed methods evaluated a range of implementation outcomes: acceptability, adoption, appropriateness, feasibility, fidelity, cost, coverage, effects and sustainability. Quantitative data was derived from the Chatbot and analysed with the Statistical Package for Social Sciences. Qualitative data was collected from key informants in the health services, Aviro Health and Stellenbosch University and analysed using the framework method, assisted by Atlast-ti.
The Chatbot provided users with 16 voice messages and graphics, in English, Afrikaans or Xhosa. Messages focused on COVID-19 and self-management of T2D. Users had to reply to a question after each message to receive the next message and give brief feedback at the end of the programme.
Findings
The Chatbot was adopted by the Metro Health Services to assist people with diabetes during lockdown and more at risk of hospitalisation and death from COVID-19. The Chatbot was disseminated via healthcare workers in primary care facilities and local non-profit organisation as well as via local media and television. Two technical glitches interrupted the dissemination, but did not substantially affect user behaviour. Minor changes were made to the Chatbot to improve its utility for users. Many patients had access to a smartphone and were able to use the Chatbot via WhatsApp. Overall 8158 people connected with the Chatbot and 4577 (56.1%) proceeded to listen to the messages, with 12.6% of them listening to all 16 messages, mostly within 32 days. Incremental set-up costs were R80,000 and operational costs over 6-months were R261,473. 3

Abstract 113

Healthcare worker perspectives on lessons from the COVID-19 pandemic for national tuberculosis programs – a quantitative survey from the IMPAC19TB project in Brazil, Russia, India, and South Africa

Dillon Wademan[1], Graeme Hoddinott[1], Irina Felker[2], Carla Almeida[3], Anil Purty[4], Sue-Ann Meehan[1], Yakov Schwartz[2], Anete Trajman[3], Kuldeep Sachdeva[5], Sanjay Mattoo, Urvashi Singh

[1]Stellenbosch University, City of Cape Town, South Africa, [2]Novosibirsk Tuberculosis Research Institute, Scientific Department, , Russian Federation, [3]Federal University of Rio de Janeiro and Rede Brasileira de Pesquisa em Tuberculose, , Brazil, [4]Pondicherry Institute of Medical Sciences, , India, [5]International Union Against Tuberculosis and Lung Diseases, South East Asia, , India, [6]Ministry of Health & Family Welfare, National TB Elimination Program, , India, [7]All India Institute of Medical Sciences, Tuberculosis Division Department of Microbiology, , India

Biography:

I have worked on a range of TB and HIV treatment and prevention studies and clinical trials. My research has predominantly focused on understanding the experiences of people exposed to and living with TB and HIV (and TB-HIV coinfection) in South Africa. My recent work has interrogated how people manage treatment within the constraints of their social contexts. This includes interrogating the limits of medical interventions and interventions targeted at minimizing interruptions along care cascades (in the form of pharmaceuticals, biotechnologies, health systems and psychosocial support interventions).

Background:

Surveillance data from high TB burden countries suggest that the COVID-19 pandemic has affected TB treatment and prevention outcomes negatively, setting back the TB elimination agenda. Healthcare workers (HCW) are well placed to offer their perspectives and reflections on lessons learnt on the impact of COVID-19 on TB control. We collaborated across four high TB burden countries with different COVID-19 and TB epidemiology and responses to understand a broad range of HCW perspectives.

Method:

We conducted a cross sectional study across TB facilities in Brazil, Russia, India and South Africa. Between June 2021 and January 2022, HCWs linked to TB and/or COVID-19 services completed an online survey or a paper version of the questionnaire.

Results:

445 HCWs completed the survey – 260, 60, 68, and 57 from Brazil, Russia, India, and South Africa, respectively. Most were women (73.4%), 35-44-years-old (34.2%; mean=42, IQR=35-50), working in the public sector (87.1%), in hospitals (41.4%), and as clinicians. Participants reported the TB program was more severely affected by COVID- 19 than other

health services. All stages of TB services along the care cascade were negatively impacted, but especially for adults entering care, i.e., people with presumptive TB. Fewer patients accessed TB care and care was of lower quality compared to the pre-COVID era. Participants also suggested lessons learnt from the COVID-19 response transferrable to the TB program, notably for TB testing, contact management, adherence support, community and civil society engagement, and the wider of use of routine data for monitoring and evaluation.

Conclusion:

HCW perceived a reported TB diagnosis decline in all four countries with general deterioration of the TB care quality. Positive lessons from COVID-19 response could help countries with health system recovery and progress towards TB elimination despite the crisis.

Poster Abstracts / Plakkaat Abstrakte

Listed alphabetically per theme / Alfabeties gelys per tema

Please note: Abstracts are published as received from the author(s)

Let wel: Abstrakte is gepubliseer soos ontvang van die outeur(s)

Theme 1 - Infectious Diseases / Tema 1 - Infeksiesiektes

100

Investigate the temporal effects of HIV and ART on retinal vessel calibre features in an HIV (on ART) Western Cape study population.

Mr. Jody Abrahams[1], Ms Boipelo Kgokane, Dr. Frans Everson, Dr. Ingrid Webster, Dr. Amanda Genis, Ms Yushra Dinnie, Professor Hans Strijdom
[1]*Stellenbosch University, Grassy Park, South Africa*

Biography:
I previously completed a degree in Human life sciences with psychology at stellenbosch main campus and am now completing my honours in Medical Physiology under the supervision of Professor Hans Strijdom

BACKGROUND
HIV/AIDS and antiretroviral therapy(ART) have been associated with changes in retinal vessel calibres, but the temporal relationships between retinal vessel calibre features and HIV/AIDS and ART are not well described in the South African population. The current study investigated whether markers of HIV/ART are associated with retinal vessel calibres in an HIV/AIDS(on ART) Western Cape study population.
METHODS
The study followed a longitudinal (baseline vs.18-month follow-up) study design. Volunteering participants (n=82) were recruited from health care clinics. Demographic, lifestyle, socioeconomic and anthropometric data were collected. Fasting blood and urine samples were collected and sent to the National Health Laboratory Services for biochemical analyses. Retinal images were obtained (Canon CR-2 camera) and vessel calibres quantified (MONA REVA 2.1.1 software). Linear mixed model analyses were applied (statistical significance: $p<0.05$).
RESULTS
The study population was relatively young (Mean±SD: 41.1±9.0 years) and mostly women (59.8%). The Mean±SD BMI was in the normal range (24.27±6.36). The median (range) viral load (50 (10 to 675032 copies mRNA/mL) and mean±SD CD4 cell count (511.3±228.9 cells/mm3) were within acceptable ranges (1000 copies mRNA/mL and 300cells/mm3). The mean central retinal arteriolar equivalent (CRAE, 144.17±14.33µm), central retinal venular equivalent (CRVE, 218.74±19.45µm) and CRAE/CRVE ratio (AVR, 0.66±0.67) were determined. After adjusting for confounding factors, each 1000 copies mRNA/mL increase in viral load was associated with a 0.096 (95%CI: 0.017 to 0.175) µm increase in CRVE ($p=0.018$) and a 0.0003 (95%CI: -0.0006 to 0.000003) increment decrease in AVR ($p=0.046$). 2nd-line ART vs. 1st-line ART was associated with an 8.58µm (95%CI: 0.35 to 16.81) increase in CRVE ($p=0.041$).
CONCLUSION
The current study showed that HIV/AIDS and the use of 2nd ART (markers of disease progression) are independently associated with venular widening and a decrease in AVR. A decrease in AVR has previously been associated with increased risk for mortality in HIV/AIDS populations.

189

A PIPELINE FOR REPRODUCIBLY ANALYSING SINGLE-CELL RNA SEQUENCING DATA

Kwame Ahiavi[1], Gerard Tromp[1]
[1]*Stellenbosch University, ,*

Biography:
Kwame Ahiavi is an MSc candidate in Molecular Biology (Bioinformatics) at the division of Molecular Biology and Human Genetics, Stellenbosch University.

A key feature of the scientific method is self-correction through independent verification, and this requires that data collection and analyses be performed in reproductive and robust manners. We are developing a robust pipeline for the analysis of single-cell RNA sequencing (scRNA-seq) data. scRNA-seq has permitted the dissection of gene expression at single-cell resolution and is providing novel insights into the composition of apparently homogeneous cell types and transitions between cell states, thereby deepening our understanding of the cell as a functional unit. The data generated by scRNA-seq are characterised by sparsity, heterogeneity, and high-dimensionality as well as large scale. As a result of biological and technical limitations, scRNA-seq data are “noisier” and more complex than their bulk RNA-seq counterparts. Thus, analysing scRNA-seq data demands new statistical and computational methods. Analytical algorithms employed in scRNA-seq pipelines are prone to producing different results depending on the state at the start of the analysis and the number of iterations of computation, complicating reproducibility. We are developing a highly robust, scalable, and reproducible analysis pipeline for scRNA-seq data, implemented in Nextflow, a workflow management system that complies with current best practices in bioinformatics. The pipeline documents all steps and transformations, records software packages and versions, and incorporates ontological metadata annotation. Containerisation of pipeline processes ensures that software dependencies are satisfied — contributing to consistent, robust, and reproducible science.

188

Implementing a Quality Assessment and Analytical Pipeline for Reproducible Multiplexed ELISA Data Processing.

1,2,3,4,6 Asimeng[1,2,3,4], Dr. Elizna Maasdorp[1,2,3,4,5], Prof. Gerard Tromp[1,2,3,4,6]

[1]1 SAMRC-SHIP South African Tuberculosis Bioinformatics Initiative (SATBBI) , , , [2]DST/NRF Centre of Excellence for Biomedical Tuberculosis Research, , , [3]SAMRC Centre for Molecular and Cellular Biology, , , [4]Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, , , [5]School of Data Science and Computational Thinking, Stellenbosch University, , , [6]Centre for Bioinformatics and Computational Biology, Faculty of Science, Stellenbosch University, ,

Biography:
MSc Molecular Biology (Bioinformatics) student at the Division of Molecular Biology and Human Genetics

A cornerstone of scientific progress is independent data verification. It is therefore necessary to develop robust analysis pipelines that can ensure reproducible and verifiable analyses. The pipeline should also record all steps and software names and versions that generated the results. The analysis of multiplexed ELISA data (Luminex data) can be challenging due to its complexity and variability. In particular, the data preprocessing stage has many steps and is often ad hoc, leading to inconsistency, non-standard approaches and poor reproducibility of analytical methods and results. An existing data preprocessing pipeline, the Luminex Pipeline, was developed to addresses some of the challenges. Our work aims to extend the Luminex pipeline's utility and its overall generalisability. We have improved the statistical summary reports component with Rmarkdown. We have also automated the pipeline's execution with the Nextflow workflow management system and developed a Singularity container for the deployment of the pipeline. The integration of containers will facilitate execution on any platform including high-performance computing clusters. Additionally, we are implementing unit testing to test the pipeline components with the R Testthat package. Unit testing will ensure greater robustness of the code, and will be compiled into an R package. Finally, we will implement a quality control component to evaluate the quality of estimated concentration of unknown samples from standard curves by incorporating functions from the R language drLumi package, which is no longer maintained.

164

A point-of-care triage test for HIV virological failure: filling the gaps in viral load coverage

Anna Saura-Lázaro, **A/Prof Peter Bock**, Dr Erika van den Bogaart, Ms Jessie van Vliet, Dr Laura Granés, Dr Kerry Nel, Mr Vikesh Naidoo, Ms Yvonne Saunders, Ms Michelle Scheepers, Mr Rene Paulsen, Prof Denise Naniche, A/Prof Elisa Lopez

[1]*Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Fransie Van Zyl Street, South Africa*

Biography:

Peter Bock Is a Family Physician and Principal Investigator working at the DTTC since 2011 with a focus on HIV and TB prevention and treatment research.

Background: Viral load (VL) monitoring in antiretroviral treatment (ART) patients is challenging, especially in high-burden settings. Access to an accurate, affordable point-of-care test (POCT) could greatly enhance ART outcomes. This study aimed to evaluate the field performance of a quantitative prototype lateral flow IP-10 POCT as a screening test for VF in South Africa.

Methods: Finger prick capillary blood was collected from patients attending a primary health clinic in the Western Cape for direct application by trained nurses onto the IP-10 POCT (index test) and compared with a plasma VL result taken ≤1 month prior (reference test) amongst adult patients on ART for ≥1 year. Logistic regression with penalized likelihood was used to build an IP-10 POCT reading values-based model able to identify individuals with VF (VL>1,000 copies/mL). Testing cost saving was estimated assuming a unit cost of 2 USD for IP-10 POCT, 22 USD for VL test plus 60% of test-associated costs.

Results: Among the 209 participants (median age 38 years and 88% female), 18% had VF. Median IP-10 POCT reading values were higher among individuals with VF compared to those without (24.0 vs 14.6; $p<0.001$). The IP-10 POCT predicted VF with an AUC=0.76 (95% confidence interval (CI), 0.67-0.85). The model identified VF with 91.9% sensitivity (95% CI, 78.1%-98.3%) and 35.1% specificity (28.0%-42.7%). Projecting a VF prevalence of 18% in a simulated cohort of 1,000 ART patients, an IP-10 screening POCT would avert >30% of the routine VL monitoring tests and associated costs.

Conclusions: The IP-10 POCT is an effective triage test for routine VL monitoring. Combining a highly sensitive, low-cost IP-10 POCT-based screening with VL testing in a two-step decision algorithm could provide a greatly needed monitoring tool in settings with low VL coverage, and result in significant savings for health systems.

110

The role of fluoroquinolone-induced bacterial stress responses in the development of antimicrobial resistance.

Miss Chante Brand[1], Dr. Mae Newton-Foot[1,2], Dr. Melanie Grobbelaar[3], Prof. Andrew Whitelaw[1,2]
[1]Division of Medical Microbiology, Department of Pathology, Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Service, Tygerberg Hospital, Cape Town, South Africa, [3]Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences, Stellenbosch University, Cape Town, South Africa

Biography:
Chante is currently a PhD student with an interest in understanding how antibiotics work, how bacteria become resistant to them and finding ways to overcome these dangerous organisms.

Introduction: In response to stressors such as antibiotics, bacteria can alter the expression of a range of global regulatory systems, called stress responses. These stress responses can contribute to development of antimicrobial resistance (AMR) by mutagenesis, (e.g. via upregulation of the SOS response gene, recA) or by regulating the expression of efflux pumps and porins. This is well studied in Escherichia coli, but less well understood in other species. This study aims to describe the effect of fluoroquinolone (FQ) exposure on the expression of stress response genes and the impact thereof on the development of AMR in E. coli and Klebsiella pneumoniae.
Methods: Laboratory strains and clinical isolates of E. coli and K. pneumoniae were cultured in the presence and absence of subinhibitory concentrations of the FQ, ciprofloxacin. Expression of recA was assessed after four hours using reverse-transcription real-time PCR. The development of AMR was quantified at 24 hours using colony counts on media supplemented with nalidixic acid.
Results: Our preliminary results suggest increased expression of recA in E. coli and K. pneumoniae and increased development of quinolone resistance in K. pneumoniae in the presence of ciprofloxacin, as compared to unexposed cultures.
Conclusions: Ciprofloxacin exposure resulted in increased expression of an SOS response gene involved in mutagenesis, with greater changes observed in K. pneumoniae. This may have contributed to the development of quinolone resistance observed in K. pneumoniae. Future plans include RNA-sequencing to define the stress responses most affected by ciprofloxacin exposure; these will be inhibited using known inhibitors to confirm their role in the development of AMR. This study will broaden our understanding of the complexity of stress responses upon antimicrobial exposure, especially highlighting differences between E. coli and K. pneumoniae. It may inform future studies exploring novel drug targets or combination therapies using stress response inhibitors and antibiotics.

54

Comparison of two typing methods for SCCmec typing in Methicillin-Resistant Coagulase-Negative Staphylococci from Community Settings in Cape Town, South Africa

Miss Farron Brooks[1], Mr Remous Ocloo[2], Ms Siphiwe Matukane[3]
[1]Stellenbosch University, Cape Town, South Africa, [2]Stellenbosch University, Cape Town, South Africa, [3]Stellenbosch University and National Health Science Laboratory (NHLS), Cape Town, South Africa

Biography:
I'm Farron Brooks, a 24 year-old first year MSc student in the department of Pathology at Stellenbosch University. My previous qualification includes a Bachelor degree in Molecular biology and biotechnology with majors in microbiology and biochemistry. I then went on to do an Honours degree in Medical Microbiology, all of which was obtained at Stellenbosch University.

Background: An increase in methicillin-resistance (MR) has been documented for coagulase-negative Staphylococci (CoNS), with MR mainly due to the acquisition of the mecA gene, which is carried on a large mobile genetic element called the Staphylococcal cassette chromosome mec (SCCmec). Characterisation of the SCCmec element is useful when describing the epidemiology of MR in Staphylococci. However, SCCmec typing in MR-CoNS is challenging due to the presence of non-typeable components and the high genetic diversity of SCCmec elements in CoNS. Currently, there are two commonly used SCCmec typing protocols for Staphylococcus aureus: the robust multiplex PCRs (mPCRs) described by Kondo et al., (2007), and the simpler, more cost-effective mPCR described by Milheiriço et al., (2007). The value of the Milheiriço mPCR in typing MR-CoNS is yet to be established. Therefore, this study aimed to determine whether the Milheiriço mPCR can be used as an alternative to the Kondo mPCRs for SCCmec typing in MR-CoNS.
Methods: DNA was extracted from 70 MR-Staphylococcus haemolyticus isolates and subjected to Milheiriço mPCR. Forty isolates were sub-selected based on banding profiles as identified by the single Milheiriço mPCR and then subjected to 2 of the 6 Kondo mPCRs, for the detection of the ccr and mec gene complexes respectively.
Results: The Milheiriço mPCR was unable to identify known SCCmec types I-VI, but did detect specific elements of SCCmec types I, II, III and V. Fifteen Milheiriço profiles and eight Kondo profiles were identified. Despite having different discriminatory powers, some agreement was observed between the methods.
Conclusion: These preliminary results suggest that the Milheiriço mPCR could be used as a less labour-intensive; cost-effective and quicker method to discriminate between SCCmec elements in MR-CoNS. However, the remaining four Kondo mPCRs and/ or whole genome sequencing could assist in confirming its usefulness.

59

Heterogeneity in tubercle bacilli as related to clinical outcomes.

Julian Coetzee[1], Prof Samantha Sampson[1], Prof Bavesh Kana[2], Dr Nastassja Kriel[1]
[1]Stellebosch University, Cape Town, South Africa, [2]University of Witwatersrand, Bramfontein, South Africa

Biography:
Julian Coetzee is an NRF-awarded student. He received his BSc (Hons) in Biotechnology from The University of the Western Cape where his research focused on the secondary metabolites produced by Streptomyces species. He recently obtained his MSc from Stellenbosch University in the Division of Molecular biology and Human Genetics. His study highlights the role a subpopulation of Mycobacterium tuberculosis known more commonly as "persisters" has on treatment outcomes in pulmonary TB patients.

Infection with Mycobacterium tuberculosis (Mtb), the causative agent of tuberculosis (TB) disease, result in varying clinical presentation. The majority of infections progress into a clinically asymptomatic state termed latent TB infection. However, a smaller proportion of infected individuals present with symptomatic, active TB. Between these states there is an array of host outcomes with varying symptoms, immune responses, and pathologies. Recently, genotypic and phenotypic heterogeneity of prevailing bacterial populations within a single individual has become apparent, and it is speculated that this could influence the outcome of infection. Therefore, a better understanding of the heterogeneity inherent to Mtb infections, at an individual and population level, is crucial. Antecedently research has shown that within genotypically homogenous populations of Mtb, heterogeneity is present in features such as permeability, cell morphology, replication rate and culturability, suggestive of metabolic differentiation occurring at sub-population level. However, the mechanistic basis and consequence of this heterogeneity during infection, including how it affects the immune response, disease outcomes and response to therapy is still unknown. Hence, the intent of this study is to determine the mechanisms underlying Mtb heterogeneity and the impact this has on host response in drug-susceptible pulmonary TB. This will be achieved through the main aim to develop and validate models which report on clinically relevant Mtb heterogeneity. This work will provide insight into heterogeneity within Mtb populations, with the ultimate goals of helping to identify biomarkers of treatment response and improved treatment approaches.

179

Chronic dolutegravir administration in rodents: probing mechanisms behind the weight gain

Ms Jana Coetzee[1], Dr Tracey Ollewagen[1], Dr Kelly Petersen-Ross[1], Prof Carine Smith[1]
[1]*Division of clinical pharmacology, Department of medicine, faculty of medicine and health sciences, Stellenbosch University , Cape Town , South Africa*

Biography:
Currently a second year MSc student in the division of clinical pharmacology. Completed BSc Medical sciences degree at the University of Pretoria with anatomy, physiology, and pharmacology as majors. This was followed by a BSc(Hons) in Clinical pharmacology at Stellenbosch University.

introduction:
Dolutegravir, an integrase strand transfer inhibitor (INSTI), forms part of the first-line antiretroviral (ARV) therapy. Despite low cost, fewer drug-drug interactions and minimal reported side effects, dolutegravir use has clinically been associated with weight gain. The significance of this in terms of adipose- and overall patient health remains to be fully elucidated.

Methods:
The effects of dolutegravir on the adipose tissue health were assessed in a 12-week treatment intervention study in Wistar rats, allowing an assessment of risk profile for dolutegravir in the absence of potential confounding effects of retroviral infection or other ARV agents commonly found in combination therapy. Dolutegravir was administered a human equivalent dose set in jelly block, once daily for 12 weeks, starting at 8 weeks of age. Retroperitoneal adipose tissue morphology and fibrosis profile, adipokine and inflammatory cytokine levels were assessed.

Results:
Dolutegravir did not change the rate of body mass increase in the rats (when compared to a placebo group). Dolutegravir did not seem to have any significant adverse effects on adipose cytokine or adipokine signalling. Data on general adipose tissue structure, adipocyte morphology and fibrotic index is being generated and will also be presented.

Conclusion:
Preliminary data suggests that the weight gain reported in patients using dolutegravir-containing therapies is either not due to dolutegravir, or may represent a 'return-to health' phenomenon rather than a side-effect of the drug.

180

The effect of Dolutegravir on levels of reactive oxygen species and endothelial tight junction proteins in a rat and overfed zebrafish model
Conradie J, Ollewagen T, Petersen-Ross KS, Smith C

Ms Janica Conradie[1], Dr Tracey Ollewagen[2], Dr Kelly Ross[3], Prof. Carine Smith[4]
[1]Division of Clinical Pharmacology, Stellenbosch University, Cape Town, South Africa, [2]Division of Clinical Pharmacology, Stellenbosch University, Cape Town, South Africa, [3]Division of Clinical Pharmacology, Stellenbosch University, Cape Town, South Africa, [4]Division of Clinical Pharmacology, Stellenbosch University, Cape Town, South Africa

Biography:
Second year master student in Clinical Pharmacology. Graduated with an honours in Physiology in 2020. Completed an undergraduate degree in BSc Human Life Sciences (Biology with Psychology). A passionate scientist and especially passionate about the zebrafish model and the many more research that can be done by using this model.

Background: Dolutegravir, an integrase strand inhibitor, is increasingly used in South Africa (and Africa) as one of the first line treatments for HIV. Both in vitro and clinical studies indicate that dolutegravir-based therapies have been associated with increased weight gain alongside increased oxidative stress. Increased adiposity has adverse effects in terms of inflammation and oxidative stress and may increase co-morbidity risk in these patients.

Aim: This study aimed to elucidate potential effects of dolutegravir on redox profile.

Methods: Adult zebrafish were submitted to chronic administration of dolutegravir in the absence and presence of obesity (overfeeding model). In order to allow for contextualisation with available literature, a parallel 12-week dolutegravir administration study was also executed in lean male and female Wistar rats. Body mass, reactive oxygen species (ROS) levels and vascular endothelial tight junction protein profile were evaluated.

Results: Hydrogen peroxide levels were measured to assess reactive oxygen species (ROS) levels. Overfed zebrafish had significantly higher body mass when compared to lean fish, with no apparent effect of dolutegravir. Similarly, 12-week dolutegravir treatment did not affect body mass in rats. Dolutegravir administration also had no detrimental effect on ROS levels in either fish or rats – in fact, it tended to decrease ROS in the zebrafish model. Tight junction protein (V-cadherin, ZO-1 and claudin) profiles will also be presented.

Conclusion: Preliminary data suggest that in the absence of HIV and other ARVs, dolutegravir treatment exhibit a beneficial risk profile in the context assessed

225

Development of a Machine Learning framework for omics data: pre-processing, performance and automation

Miss Ashley Ehlers[1,2], Professor Gerard Tromp[1,2,3,4,5]

[1]Centre for Bioinformatics and Computational Biology, Stellenbosch University, Stellenbosch, South Africa, [2]Bioinformatics Unit, South African Tuberculosis Bioinformatics Initiative, Stellenbosch University, Cape Town, South Africa, [3]Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences, Stellenbosch University, Cape Town, South Africa, [4]DSI-NRF Centre of Excellence for Biomedical Tuberculosis Research, Stellenbosch University, Cape Town, South Africa, [5]South African Medical Research Council Centre for Tuberculosis Research, Stellenbosch University, Cape Town, South Africa

Biography:

A trained and qualified bioinformatician, Researcher, and Data Scientist; Ashley Ehlers is presently a PhD Candidate & Doctoral Researcher at Stellenbosch University - completing her PhD in the 'Applications of Machine Learning for Human Disease'. The study aims to demonstrate how comparisons of Machine Learning methods are often performed by the inventors of a new method and invariably the comparison favors the new method since a study where the new method is not superior in some sense will not be published. Ashley aims too combine her knowledge of feature engineering in proteomics data to strengthen the framework.

Mapping and sequencing of the human genome in 1990 soon led to new technologies that could obtain many molecular measurements within a tissue or cell. These technologies have allowed researchers to study the underlying biology at a resolution that has never been possible. The measuring of such biological molecules in a high-throughput way is called "omics". Furthermore, advanced bioinformatics and computational biology are enabling improved performance of data-based predictions through the application of machine learning algorithms, a form of artificial intelligence which is placed to transform the twenty-first century. ML plays an important role in biomedical research, especially in the analysis of big 'omics data. Due to the intrinsic high cost of acquiring large South African omics data sets many of the data sets available in the domain are small. The sample sizes (n) pose an analytical problem since the data sets are derived from few independent observations. Thus, these data sets present many parameters (p) leading to a p>>n problem. Such data easily lead to overfitting (biased models) and therefore would require identifying characteristics of data-based prediction performance to deal with the p>>n problem. This study aims to associate omics-based molecular measurements, including data sets with sample sizes that range from tens (small) to thousands (large), with a clinical outcome of interest by identifying the key trends among several different ML algorithms, evaluating their performance metrics, and identifying their usability for human disease prediction.

Keywords: artificial intelligence; computational biology; disease; human genome; machine learning.

220

Anti-TB drugs induce gut microbiota alterations that increase the susceptibility of the pre-treated murine host to Mycobacterium tuberculosis infection

Mr Osagie Aiwerioghene Eribo[1], Prof Nelita du Plessis, Prof Gerhard Walzl, Prof Novel Chegou
[1]Stellenbosch University, Cape Town, South Africa, [2]Stellenbosch University, Cape Town, South Africa, [3]Stellenbosch University, Cape Town, South Africa, [4]Stellenbosch University, Cape Town, South Africa

Biography:
Mr Osagie A Eribo is a PhD student in the Immunology research group at Stellenbosch University. He obtained his first and MSc degrees in Microbiology and Immunology respectively from the University of Benin, Nigeria. He join the Division of Molecular Biology and Human Genetics in June 2018 for his PhD. His project focuses on understanding the relationship between the gut microbiota and TB using animal models

Notwithstanding the rate of tuberculosis (TB) treatment success, there is a reported increased susceptibility to Mtb infection in people who are successfully treated and cured of TB. This observation brings into question why the host immunity fails to create permanent protection against Mtb re-infection upon prolonged anti-TB drug exposure and cure and whether these antibiotics induce unintended consequences that undermine the ability of the host to establish a state of sterilised immunity to Mtb. This study aimed to investigate the effect of anti-TB antibiotics on the gut microbiota composition and the impact on host resistance to Mycobacterium tuberculosis (Mtb) infection in mice. We pre-treated mice with isoniazid (H), rifampicin (R), pyrazinamide (Z), and ethambutol (E) in drinking water for two months. The antibiotics-treated mice were intranasally infected with Mtb five days after stopping treatment. A different group of antibiotics-treated mice was inoculated with faecal slurry recovered from untreated animals at -1 day before Mtb infection and days 1, 3, 5 and 14 after infection. HRZE-naïve mice infected with Mtb served as controls. Preliminary results showed that pre-treatment with HRZE reduced the gut microbiota diversity and induced severe ileal histomorphological distortion. The HRZE-treated mice displayed a higher Mtb lung burden, dissemination to the spleen and liver, accompanied by more severe lung pathology. The lung and spleen Mtb loads did not differ between the HRZE-treated mice reconstituted with faecal microbiota and the HRZE-naïve controls. Furthermore, lung PD-1 and IFN-γ levels were significantly elevated in the HRZE-treated mice than in the antibiotics- naïve counter, while CD267 was significantly elevated in the spleen in the faecal microbiota transplanted than in the microbiota un-reconstituted mice. Our data suggest that anti-TB drugs induce gut microbiota alterations which impedes the ability of the host to control Mtb infection

182

Molecular evaluations of first line TB drug metabolites on cardio- and hepatotoxicity

Miss Candice Februarie[1], Dr Marguerite Blignaut Blignaut[1], Dr Lucinda Baatjies[2], Dr Kudzanai Tapfuma[2], Dr Vuyo Mavumengwana[2]

[1]Biomedical Research Institute; Division of Medical Physiology, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, South Africa, [2]Biomedical Research Institute; South African Medical Research Council Centre for Tuberculosis Research; Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, South Africa

Biography:

Candice Februarie is a Master of Science student in the Department of Medical Physiology. She graduated from the University of Stellenbosch with a BSc Hons in Molecular Biology. She is a member of the Centre for Cardio-metabolic Research in Africa (CARMA) and VuyoLab research groups. Her current research at Stellenbosch focuses on the molecular toxicity of anti-TB drugs. Candice plans to pursue her PhD after completing her MSc. She believes that a strong cup of coffee can alter your outlook on life.

Tuberculosis (TB) is an infectious disease that affects nearly 2 billion people worldwide. Despite the availability of curative anti-TB drugs, problems stemming from iatrogenic diseases, drug-resistance and other factors result in over 1 million TB fatalities annually. Among the numerous iatrogenic diseases resulting from TB drugs, cardio- and hepatotoxicity of remains poorly understood. Therefore, this study is primarily designed to examine how first-line anti-TB drugs affect the molecular mechanisms of C3A (liver) cells and H9c2 cardiomyoblast (heart) cells in vitro.

MTT assay will be used to determine optimal treatment concentrations and time intervals on both the C3As and cardiomyoblast. The concentrations at which the anti-TB dugs induce cell growth inhibition/death will be assessed to determine the mode of cell death (apoptosis/necrosis) using Annexin V/PI staining. Samples will be analysed using flow cytometry. Oxidative stress will be assessed using a DCFH-DA probe. The spent media of treated C3A liver cells will be used to treat H9c2 cardiomyoblast. After treatments with first- line TB drugs, metabolites in spent media of treated C3A
and cardiomyoblast will be identified using untargeted liquid chromatography time-of-flight mass spectrometry (LC-QTOF-MS/MS). Data analysis will be done using one-way analysis of variance (ANOVA). All drug treatments will be performed in triplicates. Results will be be presented as mean ± SD and a P value of 0.05 will be considered significant.

The collected data will indicate the extent of cardio- and hepatotoxicity as a result of TB treatment. The results from mass spectrometry analysis will direct future studies in the development of medications with a potential to ameliorate the toxic effects of TB drugs on various organs. Furthermore, this investigation is expected to confirm cardio- and hepatotoxicity of TB drugs observed in clinical studies.

Keywords: Tuberculosis; anti-TB drugs; cardiotoxicity; hepatotoxicity

252

Morbidity and Mortality in early diagnosed and treated children living with HIV in Cape Town

Dr Samantha Fry[1,2], Prof Barbara Laughton[1,2], Dr Shaun Barnabas[1,2], Dr Els Dobbels[1], Mrs Anita van Rensburg[1], Dr Peter Zuidewind[1], Prof Mark Cotton[1,2]

[1]FAMCRU, Stellenbosch University, Cape Town, South Africa, [2] Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa

Biography:

Samantha Fry is an early career researcher working at FAMCRU since 2016. She completed her paediatric specialist training at Stellenbosch University in 2015, and since joining FAMCRU, has been involved in paediatric HIV/TB research, with a particular interest in neurodevelopment and HIV Cure.

Background:

Early diagnosis and antiretroviral treatment (ART) is the mainstay of treatment for children living with HIV (CLHIV). HIV poses a high risk of mortality and morbidity. Achieving viral suppression can be challenging, even in the context of early ART initiation.

Methods:

We enrolled 68 infants where HIV was diagnosed (HIV+) in the first week of life and ART commenced within the first three months of life. We stratified outcomes for early (<8 days) and late (> 7 days) ART initiation. We report clinical and virologic outcomes over 24 months follow-up. We recruited 120 matched infants exposed, uninfected and unexposed as controls.

Results:

The median age of ART initiation in HIV+ infants was 8 days (IQR 4-13), 4 days (IQR 3-6) in the early group and 13 days (IQR 9-17) in the late group.

In the early and later treatment groups, 17 (52%) and 14 (40%) children achieved suppression. Of these 13 (76%) and 10 (71%) participants maintained suppression in the early and late groups respectively.

There were 665 adverse events, with incidence rates of 147, 691 and 743 per 100 000 in the control, early and late treated groups respectively.

There were with 54 (8%) events in 32 children classified as severe/life threatening, the majority of which were respiratory infections - 14 (27%), neutropenia was the second most common event, with 11 cases (20%) (n=11). Almost 50% of the severe/life threatening cases occurred in the late ART group.

Half of the 10 cases of pulmonary TB occurred in the early ART group.

In CLHIV, 4 deaths occurred, 2 in each ART group, with no deaths in the controls.

Conclusion

Overall and within the most severe cases, more adverse events occurred in the late ART group. More must be done to ensure early treatment and diagnosis efficiently implemented.

137

Investigating the Temporal Effects of HIV and ART on
Glomeration Filtration Rate (CKD-EPI eGFR) in a Western Cape Study Population

Dr Amanda Genis[1], Dr Frans Everson, Dr Ingrid Webster, Ms Boipelo Kgokane, Ms Yushra Dinnie, Prof Hans Strijdom
[1]*University of Stellenbosch, Bellville,*

Biography:
I have completed my PhD at the end of 2013. My main research focus was on the effects of HIV-1 and ART on endothelial function. This mainly involved lab work, but I have recently joined the clinical side of the same research area. I have supervised 5 Honours, 4 MSc students and currently have a PhD student in her final year. I have published 20 peer-reviewed articles, 1 book chapter, 1 invited commentary by the International Atherosclerosis Society, attended 4 international and several local conferences.

BACKGROUND
Estimated glomeration filtration rate (eGFR) has been associated with kidney function, but the temporal effects of HIV and ART on kidney function in South African HIV/AIDS populations are not well documented. The current study investigated the temporal changes (baseline vs. 18-month) of HIV and ART in a Western Cape study population.

METHODS
Participants (n=135) were recruited from the Cape Town area (4 groups: HIV-negative (HIV-Free: n=47), HIV-positive ART-naïve at baseline and 18 months (HIV/noARTnoART: n=9), HIV-positive ART-naïve at baseline, but on ART at 18 months (HIV/noART+ART: n=21) and HIV-positive on ART at baseline and 18 months (HIV/+ART+ART: n=58). Body mass index (BMI) and systolic/diastolic blood pressure (SBP and DBP) were taken and γ-glutamyl transferase (GGT) and high-sensitivity C-reactive protein (hsCRP) quantification was done by the NHLS. CKD-EPI eGFR was calculated according to the CHD-EPI formula. 2-way repeated measures ANOVA and ANCOVA, with Bonferroni post hoc, were applied (statistical significance: $p<0.05$).

RESULTS
The study population was mostly women and smokers. eGFR was significantly lower in HIV-Free (Baseline and 18 months: 106.4±15.8 and 106.8±14.8mL/minute/1.73m3) vs. all other study groups (HIV/noRTnoART (123.7±14.2 and 124.6±15.3mL/minute/1.73m3), HIVnoART+ART (119.1±13.8 and 114.4±18.2mL/minute/1.73m3), HIV+ART+ART (118.6±15.4 and 113.6±16.1mL/minute/1.73 m3), $p<0.05$). After adjusting for age, BMI, SBP, GGT, hsCRP, eGFR significantly decreased (Baseline vs. 18-month) in HIV/noART+ART (117.1 (111.7 to 122.6) vs. 111.7 (106.1 to 117.2) mL/minute/1.73m3, p=0.015) and HIV/+ART+ART (118.3 (114.9 to 121.8) vs. 113.9 (110.4 to 117.3) mL/minute/1.73m3, p=0.001).

CONCLUSION
Initiating ART and continuous ART-use were independently associated with a decrease in the eGFR. Results from the current study underscore the importance of monitoring kidney function in HIV/AIDS populations.

206

Determining the optimal protocol for mycolic acid extraction from Mycobacterium tuberculosis.

Ms Labeeqah Harris[1], Dr Monique Banard[1], Dr Marisa Klopper[1]
[1]*Stellenbosch University, , South Africa*

Biography:
I am currently pursuing my MSc degree within the division of molecular biology and human genetics in the TB Genomics Research Group, under the supervision of Dr. M Klopper and Dr. M Barnard. I completed an undergraduate BSc Human Life Sciences majoring in genetics and physiology at Stellenbosch University. Thereafter I completed a BSc Hons in Molecular Biology (cum laude) at Stellenbosch university - Tygerberg campus. My current research focuses on the effect of a drug resistant genomic mutations on the cell wall of Mycobacterium tuberculosis.

Mycolic acids (MA) are unique long chain fatty acids (C70 – C90) essential to the mycobacterial cell wall. MAs contribute to the architecture of the cell wall, as well as its hydrophobicity and impermeable nature, thus contributing to resistance of most antibiotics. Each mycobacterial species has a characteristic MA profile (mycolate types and chain length) which plays a role in virulence of pathogenic species, such as M. tuberculosis (Mtb). MA are the primary target of first- and second-line anti-TB drugs. Several different methods for MA extraction are available. We aimed to compare the efficiency and usefulness of an organic solvent extraction versus an enzymatic extraction of MA.
For the enzymatic extraction method, we first optimized mycobacterial cell lysis and found that a combination of lysozyme and sonication yielded the most efficient lysis. Thereafter we employed a series of enzymatic digestion steps to remove nucleic acid and protein contaminants. The extracted samples were freeze-dried prior to saponification and derivatization for subsequent analysis. The organic solvent extraction method involves methanolysis of whole cells with methanol, toluene, and sulfuric acid and thereafter elution of MA with hexane. Extracts from both methods were analyzed and validated using thin layer chromatography (TLC) and compared to commercially purchased MA standard. We showed that both extraction methods successfully extract the different mycolate classes. The enzymatic extraction method requires a large volume of starting material and is more time consuming (up to two weeks) compared to the hexane extraction (three days). However, the enzymatic extraction produces less biohazardous waste.
Optimum MA extraction is essential for successful downstream analysis including structural analysis of various mycolates by different methods including mass spectrometry and nuclear magnetic resolution.

169

Development of liquid chromatography tandem mass spectrometry (LC-MS/MS) methods for quantification of dolutegravir in various rat biological matrices to determine drug accumulation and tissue vulnerability

Miss Natasha Henning[1], Prof Carine Smith[1], Dr Tracy Kellermann[1]
[1]*Division of Clinical Pharmacology, Department of Medicine and Health Sciences, Stellenbosch University , Cape Town , South Africa*

Biography:
Second year MSc candidate in the division of clinical pharmacology. Completed BSc Human Life Sciences undergraduate degree followed by a BSc Honours in Pharmacology at Stellenbosch University.

Background: Antiretrovirals are implicated in side-effects commonly reported in people living with HIV. Dolutegravir (DLTG) is gaining popularity as part of the first line regimen in treatment of HIV/AIDS. Penetration of DLTG into known HIV reservoirs, such as the brain and the gastrointestinal tract, is essential for viral suppression. It is apparent that patients being treated with DLTG frequently experience neurological/neuropsychiatric and gastrointestinal side effects, suggesting that accumulation or effects of DLTG in these sites could be contributing to the adverse effects observed.

Methods: A protein precipitation method in conjunction with Oasis PRiME HLB cartridges was used for extraction of DLTG from 50 µL rat plasma and 200 µL brain and adipose tissue homogenate. The analytes were detected using a Shimadzu 8040 triple quadrupole-mass spectrometer LC-MS/MS. Chromatography was performed on an Agilent Poroshell 120 EC-C18 2.7 µm; 3.0 x 100 mm column, using water containing 0.1% formic acid and acetonitrile containing 0.1% formic acid as mobile phases. The flow rate was set at 0.4 mL/min. DLTG in plasma was assessed using an isocratic program while DLTG in adipose and brain was assessed using a gradient elution program.

Results: Calibration standards ranged from 1.300 – 3666 ng/mL for DLTG in adipose and brain tissue and 17.50 - 8000 ng/mL for DLTG in plasma. The correlation coefficient was greater than 0.990 for all three matrices. The mean extraction recovery of DLTG in plasma, adipose and brain tissue was 91.28, 98.81 and 78.26% respectively. Intra-run precision and accuracy for DLTG are within the acceptable limits, %CV < 15 and accuracies between 80 and 120 % for all three matrices. Matrix effects were evaluated and were within acceptable limits.

Conclusion: These developed methods are suitable for quantifying DLTG in rat plasma, brain and adipose tissues.

143

An investigation of the correlation of vitamin D status with outcomes in patients with severe COVID-19 at Tygerberg Hospital

Dr Thumeka Jalavu[1]

[1]*NHLS, Stellenbosch University, Cape Town, South Africa*

Biography:

Thumeka Jalavu is a consultant Chemical Pathologist (National Health Laboratory Service and University of Stellenbosch) at Tygerberg Hospital. After completing her undergraduate MBChB in 2009, internship and community service in 2012, she worked as a Medical Officer for eighteen months in the department of Medicine at Livingstone Hospital, Gqebera. She obtained an MMed in Chemical Pathology in 2019 and her FCPath (SA) Chem in the same year.

Her research interests include Multiple Myeloma, pre-analytical phase and chronic kidney disease. She is currently involved in COVID-19 research at in collaboration with other pathology divisions and the department of Medicine.

Background: Certain biomarkers have been shown to predict severe COVID-19. The aim of this study was to determine baseline Vitamin D (VitD) levels of patients with severe COVID-19 admitted to intensive care units (ICU) at Tygerberg Hospital and to determine if VitD deficiency is associated with poor prognosis.

Methods: A total of 86 ICU patients with polymerase chain reaction confirmed SARS-CoV-2 were prospectively recruited during the second wave between 29 October 2020 and 10th February 2021.

Results: Patients were categorized into three groups: VitD deficient, insufficient and sufficient. As only 8% of cases were VitD deficient, this group was combined with the insufficient group to form the VitD ''inadequate'' group. The study had more females at 71% (n = 61) compared to males. Because of the skewed sex distribution, both the inadequate and sufficient groups were dominated by females at 69 and 26%, respectively. The majority of patients in the inadequate group had diabetes (53%; p 0.670) and hypertension (66%; p 0.012). Factors that were found to be associated with VitD levels and mortality included gender and creatinine with an unadjusted hazard ratio (HR) of 1.66 (1.00 – 2.75) for gender (p 0.05) and 1.008 (1.002 – 1.03) for creatinine (p 0.017). The mortality rate was slightly different between the two groups, at 64 and 59% respectively, with an unadjusted Hazard Ratio of 1.006 (1.0003-1.01; p0.039). In addition, both groups had similar rates of the need for ventilation (41 vs 38%; p 0.772).

Conclusion: Our study found a high prevalence of Vitamin D inadequacy in ICU admitted patients with COVID-19 which could have contributed to their risk for severe disease. VitD inadequacy was also associated with presence of comorbidities and mortality.

14

Neutrophils as effector cells in resistance to infection by Mycobacterium tuberculosis in HIV-infected individuals

Dr Elouise Kroon[1], Prof Anna K Coussens[2,3], Prof Marlo Möller[1], Prof Gerard Tromp[1], Prof Robert J Wilkinson[2,4,5], Dr Allison Seeger[6], Prof Erwin Schurr[7,8], Prof Eileen G Hoal[1]

[1]DSI-NRF Centre of Excellence for Biomedical Tuberculosis Research; South African Medical Research Council Centre for Tuberculosis Research; Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Wellcome Centre for Infectious Diseases Research in Africa, Institute of Infectious Disease and Molecular Medicine, University of Cape Town, Observatory, South Africa, [3] Infection and Immunity Division, Walter and Eliza Hall Institute of Medical Research, Parkville, Australia, [4]Department of Infectious Diseases, Imperial College London, W12 ONN, United Kingdom, [5]The Francis Crick Institute, London, NW1 1AT, United Kingdom, [6]University of Texas at Austin, McKetta Department of Chemical Engineering, Austin, TX 78712, United States , [7]Program in Infectious Diseases and Immunity in Global Health, The Research Institute of the McGill University Health Centre, 1001 boul Décarie, Site Glen Block E, Room EM3.3210, Montréal, QC H4A3J1, Canada, [8] McGill International TB Centre, McGill University, Montréal, QC, Canada; 9Departments of Medicine and Human Genetics, McGill University, Montréal , Canada

Biography:

Dr Elouise Elizabeth Kroon obtained her MBChB degree at Stellenbosch University in 2012. She was awarded a Doctor of Philosophy degree for her dissertation entitled 'Neutrophils as effector cells in resistance to infection by Mycobacterium tuberculosis in HIV-infected individuals' by the Faculty of Medicine and Health Sciences at Stellenbosch University in April 2022. During this time, she received a European and Developing Countries Clinical Trials Partnership Career Development Fellowship (TMA2018CDF-2353) as well as a South African Medical Research Council Clinician Researcher M.D PhD Scholarship in Clinical/Health Research.

Despite being exposed to greater risk, some persons living with HIV (HIV+) never develop TB and test persistently negative for tuberculin skin test (TST) and interferon gamma release assays (IGRA) which are used to infer latent infection with Mycobacterium tuberculosis (Mtb). We have identified and defined this group as HIV+ persistently TB, tuberculin and IGRA negative (HITTIN). Neutrophils are some of the first innate cells to make contact with Mtb after exposure. We compared the neutrophil response to Mtb infection from HITTIN with that of HIV+ persons, with no TB history, but who test persistently IGRA positive, and tuberculin positive (HIT), to determine if neutrophils from HITTIN (PMNHITTIN) show unique transcriptional mechanisms.

We isolated neutrophils from 11 HIT (PMNHIT) and 17 HITTIN (PMNHITTIN). After this we infected these neutrophils with Mtb H37Rv for 1 and 6 hours. RNA was extracted and sequenced on an Illumina platform.

The results show that there was no significant difference in the differential expression of genes (DEG) when comparing the 1-hour Mtb infection effect between PMNHITTIN and PMNHIT. PMNHITTIN show significant DEG compared to PMNHIT after 6 hours Mtb infection. These DEG associated with an upregulation of terms related to NET formation and apoptosis, and downregulation of terms involving response to bacterium and inflammation.

The results show that PMNHITTIN are a distinct group of neutrophils with a unique transcriptional profile associated with antimicrobial effector functions in response to in vitro Mtb infection, compared to PMNHIT. Further functional validation is in progress.

159

South African adolescent views during the COVID-19 pandemic

Dr Barbara Laughton[1], Ms Kaylee Van Wyhe[1], Ms Thembi Fikizolo[1], Dr Ernesta Meintjies[2], Dr Andre van der Kouwe[3], Professor Barbara Laughton[1]

[1]Family Centre for Research with UBUNTU, Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, [2]Department of Human Biology and Cape Universities Body Imaging Centre, University of Cape Town, Cape Town, South Africa, [3]Department of Radiology, Harvard Medical School, USA and AA Martinos Centre for Biomedical Imaging, Massachusetts General Hospital, Boston , United States of America

Biography:

Dr Sharon Kruger is a registered psychologist and researcher who has worked extensively with children and families for the past 20 years. As a researcher at the Family Centre for Research with UBUNTU, she is part of the neuropsychological team investigating the neurocognitive development of children and the effects of HIV and prolonged ART on development. She has presented at international conferences, published journal articles and developed educational support material for schools. She continues to strive towards making a difference to the lives of others in this very important and dynamic field.

ABSTRACT

Background

The novel corona virus infection (COVID-19) was first detected in South Africa in March 2020. Soon after the country went into lockdown for six weeks. Mass media shaped people's perceptions and behaviour. We examined adolescent perceptions regarding the causes of transmission and enquired about how COVID affected them.

Method

We conducted a survey on 70 participants enrolled on a longitudinal neurocognitive and neuroimaging study, to learn about their views on COVID-19 during 2021. We used multiple choice questions to learn about perceptions of prevention and open-ended questions to enquire about how COVID-19 affected them. Multiple choice questions were analysed using descriptive statistics and two independent researchers coded and analysed the open-ended questions thematically.

Results

Participants ranged between 14 -16 years. Out of 70 participants, 69 reported that social distancing was a necessary measure to prevent COVID-19 but mentioned it was difficult to implement. Disruption of activities, financial stress, anxiety, death and having to adapt behaviour had a significant impact on the adolescents. Only two participants (of 56 living with HIV) mentioned their HIV status as a concern during the pandemic, with 90% being anxious about the risk of COVID infection. Overall COVID-19 resulted in increased worries. Concerns about being infected resulted in precautionary behaviors including wearing of masks (which was mandatory in public) and washing hands. Handwashing habits changed significantly with 63% reporting more frequent hand washing. Sixty one percent indicated that disruption to learning and social activities impacted them the most. The adolescents reported that more education about the pandemic was needed, at initial stages of the outbreak, to decrease uncertainty amid the COVID-19 outbreak.

Conclusion

Adolescents modified their behaviours in various ways to prevent infection, but the lasting effects of the impact of COVID-19 are unknown.

229

A User-Friendly Nextflow Pipeline for Mycobacterium tuberculosis Complex

Dr Johannes Loubser[1], Mr Davi Marcon[2,3], Ms Maria Cristina Lourenco[4], Prof Robin Warren[5], Dr Karla Valeria Lima[2,5], Dr Emilyn Conceicao[1], Mr Abinav Sharma[2]

[1]Stellenbosch University, Cape Town, South Africa, [2]Instituto Evandro Chagas, Seção de Bacteriologia e Micologia, Ananindeua, Brazil, [3]Centro de Genômica e Biologia de Sistemas, Universidade Federal do Pará, Belém, Brazil, [4]Laboratório de Bacteriologia, Instituto de Infectologia Evandro Chagas, Fundação Oswaldo Cruz, Rio de Janeiro, Brazil, [5]Universidade do Estado do Pará, Instituto de Ciências Biológicas e da Saúde, Pós-Graduação em Biologia Parasitária na Amazônia, Belém, Brazil

Biography:

Hanno (Johannes) is a molecular biologist with special interest in biotechnology, genetics, microbiology and bioinformatics. Since 2020, he is a postdoctoral researcher with the TB Genomics research group, where he is involved in next-generation sequencing analysis of M.tb and M.bovis. His projects of interest include the transmission dynamics of TB contacts, unknown variants of ethionamide resistance, within-host microevolution of MDR-TB, the role of DNA methylation in drug resistance, optimizing nanopore sequencing for TB diagnostics, standardization of bioinformatic pipelines for MTBC and M.bovis epidemiology. He is also very passionate about capacity building and teaching.

Introduction: The Mycobacterium tuberculosis sequencing (MTBseq) pipeline was created to address bioinformatics challenges in tuberculosis research using whole-genome sequencing data. The MTBseq default batch mode of analysis needs optimization in the context of high-performance computing (HPC) or cloud environments to use all available resources to perform analysis of large datasets.

Objective: To optimize MTBseq using the scripting language Nextflow DSL for parallel computation and user friendliness.

Methods: For implementation we relied on the modular nature of MTBseq TBfull analysis, which by default analyzes all the input raw FASTQ files in a linear manner and adds a separate mode of parallel analysis in the Nextflow wrapper by using the individual analysis steps available within the MTBseq tool, such as TBbwa and TBvariants. As a proof of concept, we used 71 M. tuberculosis genomes (NCBI accession numbers PRJNA494931 and PRJNA630228) for the benchmarking analysis on a server environment (16 vCPUs and 40GB RAM).

Results: We optimized the MTBseq software by creating a wrapper in the Nextflow language (MTBseq-nf) which (i) is capable of automatically setting up the conda environments and pulling the necessary docker containers (ii) adds a new parallel mode of execution on top of the base MTBseq tool and addresses scalability in the context of dataset size and available hardware (iii) allows for additional functionality e.g., a custom MultiQC report. The performance of MTBseq-nf parallel analysis mode (11h 1m 52s) is at least twice as fast as the batch mode (22h 22m 20s). MTBseq-nf facilitates reproducibility using the conda package manager for platform independence and docker containers which enables pipeline execution in the cloud context.

Conclusion: Compared to the original MTBseq we proposed MTBseq-nf, a user-friendly pipeline which is optimized for efficiency of hardware usage, scalability for larger datasets as well as improved reproducibility.

36

INVESTIGATING THE INFLUENCE OF BIOMIMETIC NANOPARTICLES ON M1/M2 MACROPHAGE POLARIZATION AND THEIR ANTI-MYCOBACTERIAL EFFICACY ON POLARIZED MACROPHAGES

Mr. Shamsuddeen Yusuf Ma'aruf[1], Prof Nelita Du Plessis[1], Prof. Admire Dube[2], Prof. Joshua Reineke[3], Prof. Samantha Leigh Sampson[1]

[1]Stellenbosch University, Cape Town, South Africa, [2]School of Pharmacy, University of Western Cape, Cape Town, South Africa, [3]South Dakota State University, , US

Biography:

Shamsuddeen Yusuf Ma'aruf is a postgraduate student at the Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, South Africa. He previously worked as a biomedical scientist contributing to teaching and diagnoses in the biomedical science field. He recently won the 3rd Student Participation Award for the West African-International Microscopy Workshop held in May 2022 organized by the Africa International Microscopy Network (AfInMic).

Mycobacterium tuberculosis (M.tb), the causative agent of tuberculosis (TB) remains a major public health concern. Despite the availability of various treatment regimens, treatment failure is common, partly attributed to the phenomenon of bacterial persisters. In addition, repeated or lengthy treatments can potentially induce drug-resistant strains of M.tb which further compound TB control. New approaches to TB therapy are therefore needed. A promising approach is the application of nanoparticles (NPs), which include lipid-polymer hybrid and metal-organic framework NPs, to deliver immunomodulatory compounds to macrophages to promote the intracellular killing of M.tb. This represents a novel, host-based therapeutic approach for TB.

While the use of NPs has been reported promising in our previous studies, it is imperative to consider the host-pathogen (M.tb-macrophage) relationship. M.tb has been implicated in driving a shift in the macrophage phenotype from M1 to M2. The M1 phenotype is associated with a pro-inflammatory state while the M2 phenotype is associated with an anti-inflammatory (antagonist) state. TB granulomas occupy heterogeneous macrophage populations with M2 being the predominant phenotype at a particular stage. This shift could potentially influence the activity of NPs at different stages of macrophage infection with M.tb. The study will investigate whether NPs affect macrophage polarization and/or function, and conversely, whether the anti-mycobacterial efficacy of the NPs is influenced by the macrophage polarization state. The study will adopt an array of techniques such as flow cytometry, rapid luminescence readout, and RNA sequencing.

192

Development of a robust containerised metagenomic and transcriptomic analysis pipeline

Miss Ruvarashe Madzime[1,2,3,4], Doctor Tomasz Sanko[1,2,3,4], Professor Gerard Tromp[1,2,3,4,5]

[1]Bioinformatics Unit, South African Tuberculosis Bioinformatics Initiative (SATBBI) , Cape Town, South Africa, [2]DSI/NRF Centre of Excellence for Biomedical Tuberculosis Research, Cape Town, South Africa, [3]SAMRC Centre for Tuberculosis Research, Cape Town, South Africa, [4]Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Cape Town, South Africa, [5]Centre for Bioinformatics and Computational Biology, Faculty of Science, Cape Town, South Africa

Biography:

A first year Master's student with in ardent interest in applying bioinformatics and computational biology skills in microbial research.

Introduction:

Next generation sequencing technologies have enabled the analysis of multiple genomes of microorganisms within a single sample. This includes shotgun metagenomic sequencing which enables the investigation of complex microbiome samples. Metagenomic sequencing generates vast amounts of data which often require robust computational tools for analysis. Some of the hurdles in implementing bioinformatic pipelines are reproducibility and scalability. We, therefore, aim to develop a containerised pipeline that will be used on Linux-based high-performance clusters and local servers. The pipeline is expected to perform sequence quality control, assembly, quantification, taxonomic classification, and phylogenetic analysis. The pipeline will greatly facilitate computational analysis of data generated from microbiome studies.

Methods:

The containers for the pipeline will be developed using Singularity. The containers will consist of a Linux operating system, all the analysis tools and their dependencies and will be self-standing and complete. Sequence quality control will be performed with FastQC. Initial draft of the pipeline will use a default genome assembler, with optional assemblers incorporated during further development of the pipeline. The pipeline will incorporate Qiime for taxonomic classification, diversity analysis, and phylogenetic analysis. The containers will be executed using the workflow manager Nextflow, which is Groovy based. Differential analysis and visualisation of data sub-workflows will be done in the statistical programming language R. The pipeline will be tested using environmental metagenomic datasets with known results.

Conclusion:

Containerisation will allow for robustness and reproducibility of analyses by permitting the control of versions of software which ensures comparability of results produced by the pipeline overtime. Launching the pipeline with Nextflow will ensure automated logging, collection of pipeline metadata and tracking of inputs and outputs throughout the execution of the pipeline.

115

THE ROLE OF THE ACCESSORY GENE REGULATOR SYSTEM ON BIOFILM FORMATION AND STRESS RESPONSE IN STAPHYLOCOCCUS AUREUS

Mr Kgomotso Maleka[1], Miss Siphiwe Matukane[1,2], Dr Mae Newton-Foot[1,2], Prof Andrew Whitelaw[1,2], Dr Shima Abdulgader[3]

[1]Division Of Medical Microbiology, Stellenbosch University, Faculty Of Medicine And Health Sciences, Cape Town, South Africa, [2]National Health Laboratory Service, Tygerberg Hospital, Cape Town, South Africa, [3]Division of Molecular Biology and Human Genetics, Stellenbosch University, Cape Town, South Africa

Biography:

I am Kgomotso Maleka. I am 28. I am doing my MSc in Medical Microbiology at the department of Pathology in the division of Medical Microbiology. This is my final year (2022) I started my MSc in 2020.

Background: Staphylococcus aureus strains with accessory gene regulator (agr) dysfunction are associated with strong biofilm formation which may lead to persistent infections and treatment failure. This study aims to determine the impact of agr functionality status on biofilm development and stress tolerance in clinical S. aureus isolates.

Methods: Twelve isolates collected from blood cultures between 2015 and 2017 from Tygerberg Hospital, were selected based on agr functionality, agr type, methicillin susceptibility and spa type. Crystal violet biofilm assays were performed to assess biofilm formation at over 24 hours in the presence and absence of vancomycin and rifampicin. Real-time PCR was performed to measure expression of RNAIII and icaA. Genetic differences in the agr locus and bap, icaA and icaD were determined using whole genome sequences.

Results: There was no significant difference in biofilm formation in agr functional and dysfunctional isolates at individual time points in the absence ($p=0.879$) or presence of antibiotics, at sub-MIC or serum level concentrations. The bap gene was not present in any of the isolates, and no genetic differences were detected between the icaA and icaD genes of functional and dysfunctional isolates. Similarly, icaA expression did not differ between functional and dysfunctional isolates.

Conclusions: These results suggest that agr functionality may not play a role in biofilm formation in response to antibiotic stress. The absence of genetic or expression changes in biofilm related genes, icaA, icaD and bap, suggests that differences in these biofilm production related pathways do not mask any agr-related effect. This suggests that other factors may influence biofilm formation in S. aureus in the presence and absence of antibiotics. Further genetic and expression analysis of the agr locus is in progress.

249

Global transcriptomic investigation of mycobacteria infected human macrophage response to induced expression of IFIT2

Miss Ewura-Esi Manful[1], Miss Tshiamo Motsoane[1], Dr Ray Pietersen[1], Dr Bienyameen Baker[1]
[1]*Stellenbosch University, , South Africa*

Biography:
Ewura-Esi Manful is a Masters student in Molecular Biology at Stellenbosch University. Her interest in research began during her sophomore year of her bachelor's degree when she got the opportunity to intern at the West African Centre for Cell Biology of Infectious Diseases in Ghana. She learned about the issue of drug resistance to infectious diseases and the current trends in drug discovery. Inspired by this exposure, she worked as a research assistant after her bachelor's degree and is now a Masters student conducting research on Tuberculosis. Ewura aspires to be a leading researcher in bioinformatics, cell and molecular biology.

The emergence of drug resistance has necessitated the need for new drugs to help fight against tuberculosis that is one of the leading causes of mortality worldwide. Targeting host genes as a treatment strategy is gaining traction due to the unlikelihood of host resistance developing. Interferon Induced tetratricopeptide repeats protein (IFIT) which is a well-known antiviral gene has its antiviral activities implicated in several studies. The 4 variants found in humans include IFIT1, IFIT2, IFIT3, and IFIT5 have been recently found to be involved in the killing of mycobacteria tuberculosis (M.tb). However, out of the four members, IFIT2 - a tumour suppressor gene is the only member with positive prognostic potential for cancer as the others have been found to enhance cancer development and proliferation making it a desirable gene to study further against M.tb. Thus, the aim of this study is to study and explore the downstream effects of IFIT2-induced expression in macrophage-infected mycobacteria cells to understand the role of IFIT2 in the killing of M.tb by employing global transcriptomics. THP-1 cells will be infected with M.tb after which gene knock-up (vector-based overexpression) will be done to induce the expression of IFIT2. RNA extraction will be performed and sequenced by employing Ampliseq. Data obtained from sequencing will be subjected to pathway and bioinformatic analysis to identify key genes and signaling pathways that contribute to the killing of M.tb, and the Ampliseq data will be validated through qPCR and western blot. Selected differentially expressed genes will be knockdown via small interference RNA (siRNA) and knocked up using non-viral vectors to evaluate the contribution of each of these factors towards the intracellular killing of M.tb in human macrophages. This study will provide insight into the role of IFIT2 and its downstream factors as potential therapeutic targets for the treatment of tuberculosis.

9

Characterizing persister growth in response to environmental conditions using a biofilm model

Raadhiyah Mathee[1], Prof Samantha Leigh Sampson[1], Dr Bahareh Bagheri[1], Dr Jomien Mouton[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Raadhiyah Mathee is an MSc student in the Division of Molecular Biology and Human Genetics where her research project focuses on exploiting a biofilm model to assess persister formation. She is a recipient of the NRF Masters Innovation and Scarce Skills scholarship and the Harry Crossley Foundation project funding award.

The rise in antibiotic therapy failure worldwide poses a serious threat to successful tuberculosis (TB) treatment. This is partly due to a subpopulation of cells known as persisters. Persisters possess the ability to switch to a temporary drug tolerant state, avoiding the action of antimicrobials thereby contributing to the lengthy TB treatment regimen and high treatment failure rates. Persister formation is thought to be influenced by various environmental conditions. Biofilms offer a model system to study persister formation and physiology since cells harboured within biofilms are exposed to heterogeneous environments with varying levels of oxygen and nutrients. Moreover, biofilms are enriched for persister cells and can withstand antibiotic treatment and can thus serve as an appropriate model to study the nature of persisters.
Previously the isolation and characterization of these persisters proved to be challenging using standard culture techniques, slowing the progress in research. However, with the development and validation of techniques using fluorescence dilution and flow cytometry, we are now offered insight into the microbial lifestyle at a single cell level. The proposed study will utilise these tools to 1) investigate bacteria grown within a biofilm to better understand persister cell replication dynamics and 2) to evaluate the potential interaction between Mycobacterium smegmatis and Pseudomonas aeruginosa under planktonic and biofilm growth systems. The investigation of the persister cell growth (or lack thereof) could provide a better understanding of how to target these cells to shorten the lengthy TB treatment regimens and by extension, better control of the disease.

244

MR1-Restricted T Cells: Role in Differential Outcomes Following Mycobacterium tuberculosis Exposure

Ms Mbali Mkhonza[1], Associate Professor Nelita Du Plessis[1], Professor Samantha Sampson[1], Professor Gerhard Walzl[1], Dr. Leigh Kotze[1,2]
[1]Stellenbosch University, Cape Town, South Africa, [2]Francis Crick Institution, London, England

Biography:
Ms Mbali Mkhonza is a registered PhD Candidate in the Division of Molecular Biology and Human Genetics. She completed her Hons degree in 2018, and her MSc in 2021. Mbali is an aspiring scientist with knowledge in cell culture work, mycobacterial infection, RNA and qPCR methodologies. Her research interest includes host immune response and how its role can be used in host directed therapeutics to control infection.

Mycobacterium tuberculosis (M. tb), which is a pathogenic mycobacteria, has the ability to enter the lungs of the host following inhalation and survive inside. This persistence of M. tb may ultimately lead to tuberculosis disease, which is often enhanced in individuals who are infected with HIV. Therefore, studies of the role that lung-resident, immune effector cells play, may prove crucial in determining the disease outcome following exposure to M. tb. MR1-restricted T cells can use T cell (TCRs) that are not TRAV1-2, and therefore recognizing organisms that cannot produce riboflavin. Previous findings have highlighted that these cells are able to recognize a diverse range of ligands and antigens, suggesting that lung-resident MR1T cells have a unique anti-microbial effector capacity. Therefore, MR1Ts could play a specialized role in the early detection and control of infection due to M. tb and warrant further research.

This project aims to determine the prevalence and effector function of MR1T cells in the lung and peripheral blood following exposure to M. tb and in the setting of HIV. The relationship between MR1T TCR usage and ligand discrimination to disease outcomes following exposure to M. tb will be defined and finally the role MR1T cells play in M. tb-infection control will be determine. The ultimate aim of this study is to support MR1T cell targeted vaccines and immune-therapies.

196

DEVELOPMENT OF COMPREHENSIVE SINGLE-CELL RNA SEQUENCING PIPELINE: PRE-PROCESSING, QUALITY CONTROL AND IDENTIFICATION OF OUTLIERS

Miss Tiego Mohlaba[1,2,3,4], Professor Gerard Tromp[1,2,3,4,5]

[1]Bioinformatics Unit, South African Tuberculosis Bioinformatics Initiative (SATBBI), Tygerberg , South Africa, [2]Centre for Bioinformatics and Computational Biology, Faculty of Science , Stellenbosch, South Africa , [3]DSI/NRF Centre of Excellence for Biomedical Tuberculosis Research , Tygerberg , South Africa , [4]SAMRC Centre for Tuberculosis Research , Tygerberg, South Africa, [5]Division of Molecular Biology and Human Genetics, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences , Tygerberg, South Africa

Biography:

Tiego Mohlaba is a MSc candidate in bioinformatics and computational biology at Stellenbosch University. She holds a bachelors degree in human genetics and an honours degree in bioinformatics from the University of Pretoria.

Single-cell RNA sequencing (scRNAseq) derives data from individual cells found within tissues providing insight into the variability within cell types and the complexity of tissues. As with any other method, technical noise, complications with library construction, variable cDNA capture sequencing depth, batch effects, and bias affect the utility and interpretation of results. These are particularly relevant due to the need for amplification of the limited quantity of RNA found in each cell. Pre-processing, quality control and normalisation are critical elements of scRNA analysis which are often overlooked. Pipelines that exist today were created for droplet-based data (InDrop, Dropseq and Chromium), and exclude other methods such as microwell-based sequencing. Numerous analytical pipelines and statistical methods applied such as the nf-core's scRNAseq pipeline and Seurat for R assume that basic quality control has been applied.

We created a robust scRNAseq pipeline that is more focused on improving the initial processing (pre-processing, quality control). Pipelines play a role in uniformity of results which ensures robust and reproducible science and containers ensure that the pipeline remains reproducible. We evaluated existing pipeline workflow management tools and selected Nextflow as the most suitable. Currently, we are containerising pre-processing, quality control and analytical software to ensure that defined versions are used and enhance reproducibility. Nextflow and containers can be deployed on the Centre for High-Performance Computing (CHPC) Cluster as well as other compute resources. This will permit processing of large datasets efficiently. The resultant pipeline will be robust, reproducible, allows parallelisation and follows the FAIR data principles.

117

Epidemiology, risk factors, and clinical outcomes of carbapenem resistant Enterobacterales in Africa: a systematic review

Ms Kedisaletse Moloto[1], Prof Angela Dramowski, Dr Phumuzile Dube, Prof Andrew Whitelaw, Dr Mae Newton-Foot

[1]Division of Medical Microbiology, Department of Pathology, Faculty of Medicine and Health Sciences, Stellenbosch University , Cape Town, South Africa, [2]Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa , Cape Town, South Africa, [3]National Health Laboratory Service, Tygerberg Hospital, Cape Town, South Africa , Cape Town, South Africa

Biography:

Kedisaletse is a PhD student in the Division of Medical Microbiology. The focus of her PhD is the expansion and clinical impact of emerging carbapenem resistance in the Western Cape of South Africa.

Background

The use of carbapenem antibiotics has increased worldwide in response to increasing β-lactam resistance, particularly among Enterobacterales. Carbapenem-resistant Enterobacterales (CRE) are a common cause of both hospital- and community-acquired infections and are responsible for hospital outbreaks worldwide, posing a significant threat to public health. The increase of CRE in Africa in recent years shows that there is a need for an overall view of the epidemiology of CRE colonisation and infection in Africa and to identify risk factors for CRE infection and colonisation, and clinical outcomes in this setting.

Methods

A systematic search was performed according to PRISMA guidelines using PubMed, Scopus and Web of Science. Peer-reviewed articles reporting any data on CRE isolated from humans in African countries and published in English between 2000 and 2022 were included.

Results

One-hundred and forty-one studies were included. Northern Africa was represented in the most studies (55%). Most articles described CRE infection (79.4%), 21 (14.9%) described colonization and 8 (5.7%) described both colonization and infection.

A total of 11458 CRE isolates were reported; 97.5% of the isolates represented infection. Klebsiella species (62.8%) were predominant, followed by E. coli (19.1 %) and Enterobacter species (8.5%). blaOXA-48 was the most detected carbapenemase (55%), followed by blaNDM (22%) and blaVIM (10%).

ST101 was the most common K. pneumoniae ST reported in North, Central, East and Southern Africa, followed by ST147 reported in North Africa. The most described risk factors for CRE infection were previous exposure to antibiotics; previous hospitalization, surgical procedures, and the use of indwelling devices were also reported.

Conclusions

This review has highlighted the widespread distribution of CRE in Africa. This knowledge is crucial for improving infection prevention and control (IPC) practices, antimicrobial stewardship, and other strategies to address carbapenem resistance in Africa.

194

Immune metabolic profile of innate and adaptive host immune cells in Mycobacterium tuberculosis infection

Mr Brian Munansangu[1], Prof Nelita du Plessis, Prof Colin Kenyon, Prof Andre Loxton
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
A PhD Candidate in the immunology research group (IRG) of the Stellenbosch University (Tygerberg Campus). My project focus on immunometabolism of innate and adaptive host cells in TB infection.

Mycobacterium tuberculosis (M. tb) continues to plague the human population at pandemic levels despite the availability of drugs to combat the infection. Recent studies show that M. tb induces a switch in cellular metabolism in myeloid cells to aerobic glycolysis. Whereas inhibition of glycolysis results in reduced cytokine production and mycobacterial killing. A specific group of cells identified as myeloid-derived suppressor cells (MDSCs) have been observed to suppress both innate and adaptive immune responses, by metabolic consumption and conversion of crucial amino acids L-arginine and L-tryptophan, by the activity of inducible enzymes such as arginase 1 (ARG1), nitric oxide synthase 2 (NOS2/iNOS), resulting in dampened T cell response. Research in cancer reviews that inhibition of fatty acid oxidation modulates immunosuppressive functions of MDSCs and enhances cancer therapies. We aim to determine energy metabolic pathways used by MDSCs and elucidate if these energy pathways result in enhanced anti-TB treatments. We show that Soluble mediators linked to innate and adaptive responses to M. tb, including MDSC function, remain unchanged from diagnosis to end of treatment in both cured and relapse TB patients.

260

Soluble mediators linked to innate and adaptive responses to M. tb, including MDSC function, remain unchanged from diagnosis to end of treatment in both cured and relapse TB patients.

Mr Brian Munansangu[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
PhD Candidate in Molecular Biology at Stellenbosch University

Mycobacterium tuberculosis (M. tb) continues to plague the human population at pandemic levels despite the availability of drugs to combat the infection. Recent studies show that M. tb induces a switch to aerobic glycolysis in myeloid cellular metabolism. This immunometabolic shift promotes M. tb killing through production of reactive oxygen species (ROS), nitric oxide (NO), and itaconate, catalysed by the NADPH oxidase, inducible NO synthase (iNOS) and the immune-responsive gene 1 (IRG1). A specific group of cells identified as myeloid-derived suppressor cells (MDSCs) have been observed to suppress both innate and adaptive immune responses, in part through metabolic consumption and conversion of the crucial amino acids L-arginine and L-tryptophan, by the activity of inducible enzymes such as arginase 1 (ARG1), nitric oxide synthase 2 (NOS2/iNOS), resulting in dampened T cell response. While research in cancer demonstrates that inhibition of fatty acid oxidation modulates the immunosuppressive functions of MDSCs and enhances cancer therapies. We aim to determine energy metabolic pathways used by host immune cells including MDSC in M.TB infection and if manipulation of these energy pathways results in strategies for anti-TB treatments. We show that soluble mediators (e.g., sIL-4R and sVEGFR3) and MAPK pathways in serum and bronchoalveolar lavage fluid remain unchanged from diagnosis to end of treatment in cured and relapse TB patients.

42

Biomarkers for the diagnosis of tuberculosis and monitoring of treatment response

Ms Anna Ritah Namuganga[1,2,3,5], Dr Mary Nsereko[3], Dr. Bernard Bagaya[1], Prof. Harriet Mayanja -Kizza[4], Prof. Novel Chegou[5]

[1]Department of Immunology and Molecular Biology, School of Biomedical Sciences, College of Health Sciences, Makerere University , Kampala, Uganda, [2]Joint Clinical Research Centre, Kampala, Uganda, [3]Uganda -Case Western Reserve University Research Collaboration Clinic, Kampala, Uganda, [4]Department of Medicine, School of medicine, College of health sciences, Makerere University, Kampala, Uganda, [5]5. DSI-NRF Centre of excellence for biomedical tuberculosis research; South African Medical Research Council Centre for tuberculosis research; Division of molecular biology and human genetics, Department of biomedical sciences, Faculty of medicine and health sciences, Stellenbosch University, Cape Town, South Africa

Biography:

Anna Ritah Namuganga (BLT, Msc,) is a PhD student at Makerere University, College of Health Sciences and an OWSD fellow at Stellenbosch University, Faculty of Medicine. She has contributed to the implementation of tuberculosis related protocols for different consortia at the Uganda Case Western Research Collaboration site in the last 12 years incuding the GC6, CHAIN, study 29, 29X, 30, resistor study, AETBC, ScreenTB, and TriageTB study among others. Her interest is in HIV/TB research with focus on tuberculosis host biomarker discovery and point of care diagnostics development.

Background and objective: The World Health Organization has identified non-sputum-based biomarker-based tests as urgent high-priority needs for the control of tuberculosis (TB). The aim of the current study was to assess the usefulness of selected host biomarkers in differentiating presumptive TB cases as active TB, other respiratory diseases (ORD) with or without latent TB infection (LTBI), and monitoring the response to TB treatment.

Methods: We enrolled 106 consenting presumptive PTB patients who self-presented to a TB treatment center in Kampala, Uganda. Sputum and blood samples were collected and were screened for HIV, diabetes and hepatitis. Patients were excluded if they had underlying chronic illness such as hepatitis-B, cancer and organ failure. Patients were classified as active pulmonary TB (PTB) or ORDs by sputum culture. The differential expression of selected serum host biomarkers were assessed using a 27 Multiplex ELISA kit (BIORAD, CA. USA). The TB diagnostic potential of the markers was assessed by ROC curve analysis while the most predictive signatures for disease and treatment response were assessed using general discriminant analysis.

Results: A six-marker bio-signature comprising IL6, IL1ra, TNFα, IL1β, IP10, and IL12p70 was predictive of active PTB disease among self-presenting presumptive TB cases with a sensitivity of 71% and specificity of 82%. Similarly, a 5 marker bio-signature comprising TTP, TNFα, PDGF-BB, IL9, and GCSF predicted slow compared to fast PTB treatment responders as determined by month 2 sputum conversion with a sensitivity and specificity of 82%.

Conclusion: We identified potential host biomarkers that discriminated between different M.tb disease states amongst patients who presented with symptoms requiring investigation for PTB. The biomarkers that showed diagnostic potential in our study may be considered as additional candidate markers for future active PTB rapid screening tests.

30

Nanoparticle-based host-directed therapies for eradication of Mycobacterium tuberculosis in the C3HeB/FeJ mouse model

Dr Zimvo Obasa[1], Prof Admire Dube[2], Prof Joshua Reineke[3], Prof Samantha Sampson[1]

[1]Department of Science and Innovation-National Research Foundation Centre of Excellence for Biomedical Tuberculosis Research, South African Medical Research Council Centre for Tuberculosis Research, Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Discipline of Pharmaceutics, School of Pharmacy, University of the Western Cape, Cape Town, South Africa, [3]Deparment of Pharmaceutical Sciences, College of Pharmacy and Allied Health Professions, South Dakota State University, Brookings, United States of America

Biography:

Dr Zimvo Obasa is a postdoctoral researcher at Stellenbosch University. She has a BSc degree in Human Life Sciences (2014), an MSc in Human Physiology (2017) and a PhD in Molecular Biology (2021). Her PhD research focused on understanding the host immune responses elicited by mycobacterium tuberculosis persisters in macrophage cultures and she also developed a trackable murine model for the studying of mycobacterium persister formation in Balb/c mice. Her postdoctoral research focuses on assessing in vivo response to and efficacy of nanoparticles against Mycobacterium tuberculosis in Kramink mice

Although relatively effective Tuberculosis (TB) drug regimens are available, treatment failure remains a significant roadblock to TB control. One more effective TB treatment approach is to boost the host's innate ability to kill invading pathogens – a host-directed approach using engineered bacteriomimetic nanoparticles (NP). We hypothesize that bacteriomimetic immunotherapeutic NPs will enhance in vivo killing of M. tuberculosis. Therefore, this study aims to assess in vivo response to and efficacy of NPs in the murine infection model. Further, we will determine whether the NP formulations have a synergistic effect with conventional anti-TB drugs.

We will utilize C3HeB/FeJ mice. This mouse strain is one of the few to form lesions that closely resemble those found in human disease. Mice will be infected with Mtb (50 CFU) via aerosol inhalation for 2, 4 and 8 weeks. Up to 4 non-cytotoxic nanoparticles with anti-mycobacterial activity will be administered three times a week for four weeks via pharyngeal aspiration. This will be compared to treatment with the first line anti-TB drugs rifampicin and isoniazid. After infection and treatment, groups of mice (n=5) will be euthanized by halothane inhalation, and lungs, liver and spleen will be harvested. A portion of the intact lung and spleen tissue will be reserved for histopathological analysis; stains will include H&E, auramine-rhodamine, Picrosirius red and the pimonidazole hydroxy probe to assess overall pathology, presence of Mtb, collagen deposition and regions of hypoxia, respectively. The remainder of the organs will be homogenized, and portions thereof plated for CFU determination. Portions of lung and spleen homogenates will also be reserved for phenotypic characterization using an established flow cytometry protocol.

Our results will advance the development of nanoparticle-based, host-directed therapies for tuberculosis. Knowledge gained could ultimately contribute to improved tuberculosis control strategies, specifically more effective drug treatment regimens.

64

Antibiotic-resistant staphylococci other than Staphylococcus aureus in South Africa-A One-Health Approach

Mr Remous Ocloo[1], Dr Mae Newton-foot, Dr Wilma Zievhur, Prof Andrew Whitelaw
[1]*Stellenbosch University, Green Lane C Block Fransie Van Zyl Ave, South Africa*

Biography:
PhD student in the department of pathology, divison of immunology and medical microbiology.

Background
Staphylococci other than Staphylococcus aureus (SOSA) includes coagulase-negative staphylococci and coagulase producing staphylococci that are not S. aureus. SOSA can be opportunistic pathogens responsible for a range of human and animal infections. Antimicrobial resistance (AMR) in SOSA threatens the treatment of these infections. Additionally, SOSA may function as traffickers of resistance genes to more pathogenic S. aureus. Understanding the development and dissemination of AMR within and between humans and animals using a One-Health approach can aid the development of new strategies to mitigate AMR.
Methodology
Clinically significant SOSA isolates (n=51) from diagnostic samples were collected from Tygerberg Hospital microbiology laboratory. Samples were also collected from the community (n=150) and from pig farms (n=208). Community samples comprised stool samples from healthy children. From the pig farms, nasal swabs from pigs (n=141) and farm workers (n = 21), and environmental samples (n=45) were collected. All samples were cultured onto selective media to isolate SOSA. Species identification and antibiotic susceptibility testing were done using MALDI-TOF and standard Kirby Bauer disc diffusion respectively.

Results
A total of 324 isolates were identified, comprising 15 different species. S. epidermidis was the commonest clinical isolate, while S. haemolyticus was common across all settings. Tetracycline resistance in S. haemolyticus was higher in isolates from the farms (n=15; 100%) than from the community (n=30; 38%) ($p<0.001$). The clinical isolates were mostly resistant to erythromycin (n= 12; 100%), and 17% showed tetracycline resistance.
Conclusion
The high tetracycline resistance rate in animal-associated isolates may be linked to antibiotic usage on farms. The lower, although still concerning, rate of tetracycline resistance in isolates from children (where tetracycline is contra-indicated) may suggest a flow of tetracycline resistance into the community. The potential impact on human health deserves further investigation.

144

An analytical investigation of the impact of crushing of first-line antituberculosis medication and administration via a nasogastric tube

Mr Cassius Phogole[1]
[1]*Stellenbosch University, cape Town, South Africa*

Biography:
I am Cassius Phogole, a PhD student at Stellenbosch University, Tygerberg campus

Background: Currently, the treatment of tuberculosis (TB) patients admitted to intensive care units (ICU) in South African Hospitals is performed by crushing the first-line drugs isoniazid (INH), rifampicin (RIF), pyrazinamide (PZA), and ethambutol (EMB) and administering them to patients via a nasogastric (NG) tube. This has, however, been associated with low drug exposure insufficient to treat the infection. The aqueous stability and solubility of these crushed drugs are currently unknown. Therefore, the study aimed to determine the root cause of the poor drug exposure observed when crushing the first-line TB drugs and administering them through NG tube using laboratory-based methods.
Methods: Analytical methods for the quantitation of study drugs were developed and validated according to the FDA and EMA guidelines. Aqueous solubility of crushed drugs under inversion mixing method versus easily implementable mixing methods within ICU settings was evaluated with/without ascorbic acid (Asc). Stability of whole vs crushed tablets in simulated gastrointestinal fluids with/without Asc was also evaluated.
Results: During the inter- and intra-day validations, the analytical methods were shown to be specific, sensitive, robust, accurate, and precise. All drugs demonstrated good stability except for RIF, which showed significant degradation in simulated gastric fluid. RIF also demonstrated poor aqueous solubility (4.6%) under inversion mixing method compared to the synergistic effect of both sonication and vortexing, which achieved 46.7 and 91.7% solubility in the absence and presence of Asc, respectively. Moreover, Asc is also significantly improved the solubility of RIF in simulated intestinal fluid (SIF) from 73% to 100% drug solubility.
Conclusion: RIF is poorly water soluble and unstable in simulated gastric fluid. However, vortexing and sonication with the addition of Asc to crushed TB medication have significantly been shown to improve the solubility of RIF in water. Asc also shown to have a solubilizing effect on RIF in SIF.

214

Antiretroviral therapy and subclinical, HIV-associated cardiovascular disease: A prospective cardiac biomarker and CMR tissue characterisation study

Dr Pieter-Paul Robbertse[1,2], Prof Anton Doubell[1], Prof Tonya Esterhuizen[2], Dr Philip Herbst[1]
[1]Division of Cardiology, Faculty of Medicine and Health Sciences, University of Stellenbosch , Cape Town, South Africa, [2]University of Pittsburgh HIV-Comorbidities Research Training Programme in South Africa, Cape Town, South Africa, [3]Division of Epidemiology and Biostatistics, Department of Global Health, Stellenbosch University, Cape Town, South Africa

Biography:
I am a researcher-clinician that strives to improve the understanding and expertise of cardiovascular disease in a resource constrained South Africa. I completed my MBChB degree cum laude at Stellenbosch University in 2015. I recently submitted my PhD dissertation titled "Prospective evaluation of the presence, profile and evolution of asymptomatic cardiovascular disease in treatment naïve, HIV-infected patients using cardiac magnetic resonance imaging after initiation on antiretroviral therapy."

Background
People living with HIV infection (PLWH) are at increased risk of heart disease, and cardiovascular magnetic resonance (CMR) has been instrumental to better understand HIV-associated cardiomyopathy (HIVAC). Unfortunately, CMR's widespread use is limited, especially in low-income regions. Biochemical markers are fundamental in cardiac evaluation, and various novel assays have recently been discovered. We prospectively evaluated the hearts of newly diagnosed PLWH using cardiac biomarkers and correlated our findings with CMR.

Methods
Newly diagnosed, antiretroviral treatment (ART) naïve PLWH were recruited along with HIV uninfected, age- and sex-matched controls. All participants underwent measurement of high-sensitivity cardiac troponin T (hs-cTnT), N-terminal pro B-type natriuretic peptide (NT-proBNP), soluble ST2 (sST2), Galectin-3, and a CMR study with multiparametric mapping. The HIV group started ART and was re-evaluated 9 months later. The cardiac biomarkers and CMR parameters were evaluated in, and between groups.

Results
Compared with controls (n=22), hs-cTnT, NT-proBNP, and Galectin-3 were all significantly higher in the ART naïve group (n=73) ($p \leq 0.03$). After 9 months of ART, hs-cTnT and NT-proBNP both decreased significantly ($p \leq 0.03$) and a trend of decrease was seen in sST2 ($p=0.08$). Galectin-3 did not demonstrate decrease over time ($p=0.6$). The cardiac biomarkers that showed the best correlation with CMR measurements native T1, T2, and ECV, were NT-proBNP ($rs \geq 0.4$, $p<0.001$) and Galectin-3 ($rs \geq 0.3$, $p<0.01$).

Conclusion
Our data suggest that subclinical myocardial injury, remodelling, and fibrosis are present during early HIV infection. ART has a positive influence on the biomarkers associated with these processes in the short term. However, it remains unclear if the underlying pathological processes were fully addressed by ART. The ability of cardiac biomarkers to detect and track tissue abnormalities diagnosed with CMR, showed promise. This could lead to improvements in screening and monitoring myocardial abnormalities, even in CMR-limited settings.

213

Evolution of myocardial oedema and fibrosis in HIV infected persons after the initiation of antiretroviral therapy: A prospective cardiovascular magnetic resonance study

Dr Pieter-Paul Robbertse[1,2], Prof Anton Doubell[1], Prof Carl Lombard[3,4], Dr Mohammed Talle[1,5], Dr Philip Herbst[1]

[1]Division of Cardiology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]University of Pittsburgh HIV-Comorbidities Research Training Programme in South Africa, Cape Town, South Africa, [3]Biostatistics Unit, South African Medical Research Council, Cape Town, South Africa, [4]Division of Epidemiology and Biostatistics, Department of Global Health, Stellenbosch University, Cape Town, South Africa, [5]Department of Medicine, Faculty of Clinical Sciences, College of Medical Sciences, University of Maiduguri, , Nigeria

Biography:

I am a researcher-clinician that strives to improve the understanding and expertise of cardiovascular disease in a resource constrained South Africa. I completed my MBChB degree cum laude at Stellenbosch University in 2015. I recently submitted my PhD dissertation titled "Prospective evaluation of the presence, profile and evolution of asymptomatic cardiovascular disease in treatment naïve, HIV-infected patients using cardiac magnetic resonance imaging after initiation on antiretroviral therapy."

Background

HIV infected persons on antiretroviral therapy (ART) may have functionally and structurally altered ventricles related to cardiovascular inflammation. Mounting evidence suggests that the myocardium of HIV infected individuals may be abnormal before ART is initiated. These abnormalities could represent subclinical HIV-associated cardiomyopathy (HIVAC). The influence of ART on subclinical HIVAC is not known.

Methods

Newly diagnosed, ART naïve persons with HIV infection were consecutively enrolled along with HIV uninfected, age- and sex-matched controls. All participants underwent comprehensive cardiovascular assessment, including contrasted cardiovascular magnetic resonance imaging with multi-parametric mapping. The HIV group was started on ART and re-evaluated 9 months later. Cardiac tissue characterisation was compared in, and between groups.

Results

Seventy-three ART naïve, HIV positive individuals and 22 healthy controls were enrolled. The global native T1, global T2, and the prevalence of pericardial effusion were higher in the HIV infected group at diagnosis ($p<0.02$). Global native T1 and extracellular volume (ECV) decreased after 9 months on ART ($p\leq0.001$) and were associated with a decrease in the HIV viral load, decreased systemic inflammation, and improvement in the CD4 count ($p\leq0.001$). Late gadolinium enhancement (LGE) at the basal to mid infero-posterior segments, was significantly higher in the HIV infected group ($p=0.02$). The prevalence of LGE did not change significantly over the 9-month study period ($p=0.4$).

Conclusion

Subclinical HIVAC may already be present at the time of HIV diagnosis, as suggested by subclinical myocardial oedema and fibrosis found to be present before ART initiation. Improvements in the CD4 count, viral suppression, and decreased systemic inflammation were associated with favourable changes of myocardial oedema markers. However, the LGE-findings suggest a component of irreversible cardiac injury. It is unclear

if the underlying pathological mechanisms were halted or merely slowed by ART. Additional research on the significance of subclinical myocardial fibrosis and oedema are required.

138

Zebrafish behavioural response to ivermectin: insights into potential neurological risk

Dr Yigael Powrie[1], Prof Marique Aucamp[2], **Prof Carine Smith[1]**
[1]Div. Clinical Pharmacology, Dept Medicine, Stellenbosch University, , South Africa, [2]Dept Pharmaceutical Sciences, University of Western Cape, , South Africa

Biography:

.

Background: Ivermectin is a well-known and widely used anti-parasitic drug. Recently, in vitro data suggest anti-viral efficacy of the drug, albeit at much higher concentrations than currently approved. Despite warnings by several governing bodies, the (uncontrolled) human use of ivermectin has significantly increased during the COVID-19 epidemic.
Aim: This study thus aimed to elucidate potential neurological risk of particularly the veterinary formulation of ivermectin in comparison to pure ivermectin.
Methods: Zebrafish eggs (1hpf) and larvae (4dpf) were exposed to a range of concentrations of either pure ivermectin (IVM) or a veterinary formulation (V-IVM) for a period of 24 hours. Behavioural responses to both treatments were assessed at various timepoints using the pentylenetetrazol assay, the light-dark assay and a 5-day teratogenesis protocol. In addition, dissolution rates were calculated for both treatments.
Results: Acute responses of larvae at 4 - <5dpf was similar for both treatments – a transient hyperlocomotion was followed by a general hypolocomotion (ANOVA dose effect, $P<0.01$). Both IVM and V-IVM-treated larvae showed significant dose-dependent (ANOVA dose effect, $P<0.0001$) decreases in responsiveness to repeated light-dark transitions, which again was more pronounced in IVM. These effects were maintained after 24 hours of exposure. In contrast, when ivermectin was administered prior to establishment of the blood brain-barrier in the teratogenesis protocol, V-IVM treatment was linked to more severe activity decline on <5dpf. Differences in dissolution rates cannot account for these differences.
Conclusion: Current data suggest significantly higher neurological risk of a veterinary formulation of ivermectin under conditions allowing penetration across the blood brain-barrier.

19

Development of in vitro persister model utilising double auxotroph Mycobacterium tuberculosis ΔleuDΔpanCD

Ms Tayla Juliet Smith[1], Prof Samantha Sampson[1], Dr Zimvo Obasa[1]
[1]*Division of Molecular Biology and Human Genetics, Biomedical Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:
Tayla Smith is a postgraduate student in the Division of Molecular Biology and Human Genetics at Tygerberg Medical School, Stellenbosch University. Ms Smith graduated in 2021 with her BScHons in Molecular Biology cum laude, from Stellenbosch University. She is currently pursuing her MSc in Molecular Biology, with her research focused on Mycobacterium tuberculosis (Mtb). Her field of interest is the slow-growing and drug-tolerant subpopulation of Mtb cells known as persisters. Her MSc project hopes to produce an in vitro persister model and then challenge that model with potential persister-targeting compounds.

While the first-line anti-TB drugs administered in today's treatment have been available since the early 1950's, treatment is lengthy, rigorous and successful outcomes are often complicated by the emergence of drug-resistant and persister populations. As a result, there is not only interest in the development of novel drugs that can target these recalcitrant populations but also interest in models that are representative of these populations. Persister populations are a particular complication regarding TB treatment and are the reason for the extended treatment period. This project will focus on these Mycobacterium tuberculosis (Mtb) persister cells, which are classified as such due to their viable but non-replicating (VBNR) state in response to unfavourable conditions, such as the antibiotic presence or nutrient limitation in the host. This VBNR state renders the cell drug-tolerant, which is reversible once growth conditions become more favourable. The project aims to produce an in vitro persister model through nutrient limitation by taking advantage of the double auxotrophic nature of Mtb ΔleuDΔpanCD. This strain will be grown under conditions lacking leucine, pantothenate or both; these are both supplements that Mtb ΔleuDΔpanCD requires for optimal growth. The strain will also be carrying the dual reporter plasmid pTiGc, expressing a constitutive green and inducible red fluorescent protein. This reporter plasmid allows for simultaneous monitoring of viability and replication dynamics at a cellular level, through fluorescence dilution. The implication is that the number of intracellular persister cells, which exist in minute proportions in Mtb populations, can be quantified and monitored. If successful, this model could be applied to screen potential persister-targeting anti-mycobacterial compounds.

183

SARS-CoV-2 infection and risk of pulmonary tuberculosis disease in children and adolescents: A case-control study

Dr Jeremi Swanepoel[1], Prof Marieke Van der Zalm[1], Prof Wolfgang Preiser[2], Prof Gert Van Zyl[2], Prof Anneke Hesseling[1], Prof David Moore[3], Prof James Seddon[1]

[1]Desmond Tutu TB Centre, Cape Town, South Africa, [2]Division of Medical Virology, Department of Pathology, Faculty of Medicine and Health Sciences, Stellenbosch University and National Health Laboratory Service, Cape Town, South Africa, [3]TB Centre, London School of Hygiene and Tropical Medicine, London, United Kingdom

Biography:

Jeremi is an early-career researcher from Cape Town, South Africa. He obtained his medical degree from Stellenbosch University in 2016 and completed his Master of Science in Tropical Medicine and International Health at the London School of Hygiene and Tropical Medicine in 2021. He is currently assisting as a clinician-researcher at the Desmond Tutu TB Centre where he is involved with a variety of adolescent TB and lung health related research projects. He is also a clinical research manager for the HIV Mental Health Research Unit at the University of Cape Town and involved with the CONNECT study.

Background

The Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2) pandemic has substantially worsened the global tuberculosis (TB) epidemic but evidence on the possible interaction between SARS-CoV-2 and TB, especially in children and adolescents, remains limited. We aimed to evaluate the relationship between previous infection with SARS-CoV-2 and the risk of TB in children and adolescents.

Design/ Methods

An unmatched case-control study was conducted using individuals recruited into two observational TB studies (Teen TB and Umoya), between 1 November 2020 and 1 November 2021, in Cape Town, South Africa. Sixty-four TB cases (aged <20 years with pulmonary TB) and 99 controls (aged <20 years without pulmonary TB) were included. Demographics and clinical data were obtained. Serum samples collected at enrolment underwent quantitative SARS-CoV-2 immunoglobulin G (IgG) testing using the Abbott SARS-CoV-2 IgG II Quant assay. Odds ratios (ORs) for TB were estimated using unconditional logistic regression.

Results

Overall, participants who were SARS-CoV-2 IgG seropositive as a marker of past infection had a reduced odds of pulmonary TB compared to seronegative participants (OR 0.51; 95% CI: 0.23-1.11; p=0.09). Of those with positive SARS-CoV-2 serology, IgG titres were higher in individuals with TB compared to controls (p=0.04) and those with IgG titres in the highest tertile were much more likely to have pulmonary TB disease compared to those with IgG levels in the lowest tertile (OR: 4.00; 95%CI: 1.13– 14.21; p=0.03).

Conclusions

SARS-CoV-2 seropositivity was not associated with TB disease, however the magnitude of SARS-CoV-2 IgG response may be associated with an increased risk of pulmonary TB. The small sample size and issues with selection bias are notable limitations. Future studies, evaluating how host immunological responses to SARS-CoV-2 and M. tuberculosis change with age, sex and puberty, will shed more light on the interplay between these two diseases.

104

Drug-resistant tuberculosis case-finding strategies: A scoping review

Susan Van Wyk[1], Marriott Nliwasa[2], Fangwen Lu[3], Chih-Chan Lan[3], James A Seddon[4], Graeme Hoddinott[4], Lario Viljoen[4], Gunar Günther[5,6], Nunurai Ruswa[7], Sarita Shah[8], Mareli Claassens[4,6]

[1]Centre for Evidence Based Health Care, Division of Epidemiology and Biostatistics, Department of Global Health, Stellenbosch University, Cape Town, South Africa, [2]Helse Nord Tuberculosis Initiative, Kamuza University of Health Sciences, Blantyre, Malawi, [3]National Taiwan University, Taipei, Taiwan, [4]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, [5]Department of Pumonary Medicine, Inselspital, Bern University, Bern, Switzerland, [6]Department of Human, Biological & Translational Medical Science, School of Medicine, University of Namibia, Windhoek, Namibia, [7]Ministry of Health and Social Services, Windhoek, Namibia, [8]Departments of Epidemiology and Global Health, Rollins School of Public Health, Emory University, Atlanta, USA

Biography:

Dr Susan van Wyk is a part time researcher at the Centre for Evidence-based Health Care. She has a background in medicine and epidemiology. As part of the Research, Evidence & Development Initiative (READ-It), Susan collaborates in conducting TB related systematic reviews and qualitative evidence syntheses to inform national and international guidelines. She also teaches evidence-based health care and screening & diagnosis methodology to undergraduate and postgraduate students.

Background

Finding individuals with drug-resistant tuberculosis (TB) is important to control the pandemic and improve patient clinical outcomes. To our knowledge systematic reviews assessing effectiveness, cost-effectiveness, acceptability and feasibility of different drug-resistant TB case-finding strategies to inform research, policy and practice, have not been conducted and the scope of primary research is unknown. We therefore assessed the available literature on drug-resistant TB case-finding strategies.

Methods

We looked at systematic reviews, trials, qualitative studies, diagnostic test accuracy studies and other primary research that had sought to improve drug-resistant TB case detection specifically. We excluded studies which invited patients seeking care for TB symptoms, patients already diagnosed with TB or were laboratory-based. We searched the academic databases of CENTRAL, MEDLINE and EMBASE using no restrictions. We screened titles, abstracts (TIAB) and full text articles in duplicate. Data extraction and analyses were done in Excel.

Results

We screened 3018 TIABs and 177 full-text articles. We identified six systematic reviews and 47 primary studies. Five reviews described yield of contact investigation and focused on household contacts, airline contacts, comparison between drug-susceptible and drug-resistant contacts and concordance of drug-resistant profiles between index cases and contacts. One review compared universal versus selective drug-resistant testing. Primary studies described the following: 27 contact investigations; 11 outbreak investigations; 3 airline contact investigations; 2 public-private partnership programmes; 2 epidemiological analyses; follow-up after treatment success and an e-registry programme. Primary studies were all descriptive and included cross-sectional and retrospective reviews of programme data. No trials were identified. Data extraction from contact investigations was difficult due to poor reporting of relevant information.

Conclusions

There is a lack of primary studies for inclusion in systematic reviews assessing effectiveness of different drug-resistant TB case-finding strategies and there is a need for improved reporting of contact investigation studies. Existing descriptive systematic reviews can be updated.

47

The gastrointestinal carriage of plasmid-mediated antibiotic resistance genes in children from Cape Town communities.

Miss Danielle Wilck[1], Miss Chante Brand[1], Miss Amanda-Jo Venter[1], Prof Anneke Hesseling[2], Dr James Seddon[2,3], Dr Anne-Marie Demers[2], Prof Andrew Whitelaw[1,4], Dr Mae Newton-Foot[1,4]

[1]Division of Medical Microbiology, Stellenbosch University, Faculty of Medicine and Health Sciences , Cape Town, South Africa , [2]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, [3]Department of Infectious Diseases, Imperial College London, London, England, [4]National Health Laboratory Service, NHLS, Tygerberg Hospital, Cape Town, South Africa

Biography:

I received my undergraduate degree, a BSc in Genetics and Human Anatomy and Physiology, at the University of Cape Town in 2020. I then completed an BSc Hons in Medical Microbiology at the Division of Medical Microbiology, Stellenbosch, where I am currently completing my MSc in Medical Microbiology. Outside of my education, I am involved in my community through volunteering, tutoring and personal enrichment programs. I hope to positively impact my community through the advancement and understanding of diseases burdening the health care system, with specific focus on the gut microbiome and the effects it may have on overall health.

Background: Antibiotic resistance is a significant threat to public health worldwide, however, the gastrointestinal carriage of antibiotic resistance genes in healthy individuals in the community is not well described. The gut microbiome is recognised as a reservoir for antibiotic resistance genes, which has shown to be exacerbated by antibiotic use. This study aimed to describe the changes in the carriage of plasmid-mediated quinolone and β-lactam antibiotic resistance genes in the gastrointestinal bacterial population of children from Cape Town communities.

Methods: The Tuberculosis Child Multidrug-resistant Preventive Therapy (TB-CHAMP) trial is a double blinded, placebo-controlled trial evaluating the impact of 24-weeks of levofloxacin prophylaxis to prevent the development of multidrug-resistant TB in children (<5 years). Stool samples were collected from enrolled children at baseline before commencing treatment (n=100) and upon completion of 24 weeks of treatment with levofloxacin or placebo (n=48), between 2017 and 2019. DNA was extracted and real-time and conventional PCR was performed to detect the plasmid-mediated resistance genes qnrS, qnrB, aac(6')-Ib-cr, blaTEM, blaSHV and blaCTX-M.

Results: Amongst the 100 baseline samples, the plasmid-mediated quinolone resistance (PMQR) genes, qnrS, qnrB and aac(6')-Ib-cr were detected in 86%, 14% and 9% of participants, respectively, while the β-lactamase genes blaTEM, blaSHV and blaCTX-M were detected in 99%, 57% and 13%, respectively. Analysis of the 24-week samples indicated statistically significant increases in the carriage of qnrS (92%; p=0.04), qnrB (38%; p<0.01) and aac(6')-Ib-cr (23%; p=0.02). No statistically significant differences were observed in the carriage of blaTEM (96%), blaSHV (42%) and blaCTX-M group B (6%) at 24 weeks.

Conclusion: High baseline carriage of plasmid-mediated β-lactamase and quinolone resistance genes was observed in this population at baseline, with increased rates of carriage of PMQRs at 24 weeks. Carriage of resistance genes may increase the risk of developing resistant infections, with poorer treatment outcomes.

Theme 2 - Non-Communicable Diseases / Tema 2 – Nie-Oordraagbare Siektes

160

Integrating whole exome sequencing into the breast cancer clinical setting: Process and outcome.

Professor Karin Baatjes[1], Ms Mardelle Schoeman[1], Dr Abisola Okunola[1], Dr Nerina van der Merwe[2], **Prof Maritha Kotze[1]**

[1]Stellenbosch University, , , [2]University of the Free State, Bloemfontein, South Africa

Biography:

Prof Maritha Kotze is a Principal Medical Scientist jointly appointed by Stellenbosch University and the National Health Laboratory Service of South Africa. She started her career as a human geneticist in 1981 after obtaining the degrees BSc, BSc honours and MSc cum laude at Stellenbosch University. Since obtaining her PhD in 1990, Prof Kotze trained numerous postgraduate students involved in test development for clinical application of genomics in a wide range of medical conditions. Her work involves the integration of research and service delivery using a pathology-supported genetic testing approach based on research published in more than 150 peer-reviewed articles

Background: Integrating service delivery and research may bridge the clinical implementation gaps associated with interdisciplinary investigations. We demonstrated that information obtained through pharmacogenetic studies can benefit patients and their extended families in the field of oncology. Therefore, confirmation of research findings in a diagnostic laboratory can be clinically useful.

Aim: This study describes the process and outcome of potentially pathogenic gene variants identified by whole exome sequencing (WES) in a research context aligned with genetic counselling support.

Methods: In a study of postmenopausal breast cancer patients on aromatase inhibitor therapy, at risk for bone loss, screening for BRCA1/2 founder variants previously identified in the South African population was performed as per routine breast cancer risk management. Blood samples were obtained from all participants for extended genetic testing using a pathology-supported genetic testing platform integrating WES. Upon completion of the study, genetic counselling was offered for individuals with pathogenic BRCA1/2 variants detected by WES. Sanger sequencing of the family specific BRCA1/2 variants were performed as a clinical genetic service if the patient so wished.

Results: The WES research results were confirmed independently in a diagnostic laboratory. Post-test genetic counselling and family screening was performed as appropriate in postmenopausal breast cancer patients with hormone-receptor-positive breast cancer. The results were relayed to patients in an explanatory report focused on the pathogenic BRCA 1/2 variants detected by WES and confirmed by Sanger sequencing.

Conclusion: The process for return of breast cancer research results confirmed in a diagnostic setting, demonstrates the value of research translation into an adaptable patient report. The ethical framework applied opens new avenues for utilization of research information back into routine clinical practice, while providing learning and training opportunities beyond singular research objectives. Research translation at the intersection of the laboratory and clinic facilitates data-driven patient care.

195

Audit of Serum Free Light Chain testing in the screening of patients for monoclonal gammopathies

Dr Razia Banderker[1], Dr Thumeka Jalavu[1], Dr Aye-Aye Khine[2], Dr Fatima Fazel[1], Prof Annalise Zemlin[1]
[1]Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Service, Cape Town, South Africa

Biography:
Dr Banderker is a senior registrar in the division of Chemical Pathology, department of Pathology, Tygerberg Hospital.

Introduction
Monoclonal gammopathies comprise a wide range of disorders, from the pre-malignant Monoclonal Gammopathy of Undetermined Significance (MGUS) to Multiple Myeloma (MM) which is associated with significant morbidity and mortality.

This study aimed to investigate the effectiveness of serum free light chain (SFLC) testing in screening patients for monoclonal gammopathies at Tygerberg NHLS.

Methods
Data extract of all serum free light chain requests in the two-year period of May 2018 to April 2020 performed. Demographic statistics and frequency of abnormal SFLC results determined. Concordance between SFLC and Serum Protein Electrophoresis (SPE) was investigated in Tygerberg Hospital (TBH) patients.

Preliminary results
1425 patients were included in the retrospective audit. Mean age = 59 years. 60,4% of patients were female. Most requests were received from tertiary healthcare facilities (83%) while only 15% were from secondary healthcare institutions. SFLC ratios were abnormal in 52% of 1425 requests, while 26,5% showed an inflammatory pattern.

Out of 128 TBH patients with abnormal SFLC ratios, 53% had negative SPE findings (n=68). 62% of these patients had renal impairment (eGFR < 60). Monoclonal gammopathies were diagnosed in some with abnormal SFLC ratios, preserved renal function and negative SPE.

Out of 29 TBH patients with normal SFLC ratio, 5 had detectable paraprotein on SPE (16%).
56 patients had abnormal ratios and detectable paraprotein on SPE. Of these, only 17,9% had serum calcium >2,75 mmol/L, 28,6% had serum creatinine >177 umol/L, and 58,9% had significant anaemia (Hb <11 g/dL in males, <10 g/dL in females).

Conclusion
Both SPE and SFLC should be performed when screening for monoclonal gammopathies, as suggested by international guidelines.
At the time of diagnosis, CRAB criteria were present in a minority of confirmed cases.

94

The utility of a non-mydriatic fundus camera in a tertiary diabetes clinic.

Dr Samia Ben Barka[1], Dr C Lourence[1], Miss M Magoya[2], Dr L Du Toit-De Wet[3], Dr M Conradie-Smit[1]
[1]1. Division of Endocrinology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape town , South Africa , [2]2. Division of Epidemiology and Biostatistics, Faculty of Medicine and Health Sciences, Stellenbosch University,, Cape Town , South Africa , [3]3. Division of Ophthalmology, Department of Surgery, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

Biography:
MBBCH ,Tripoli University,2010
Started her career in Internal Medicine for three years at her back home then got a scholarships to South Africa.
Obtained a fellow of the collage of physician of South Africa After 4 years , MMed in clinical Internal medicine 2020.
a fellow in Endocrinology Department started 2021

BACKGROUND:
Diabetes mellitus is rapidly escalating in prevalence globally. This is affecting health systems everywhere but especially in developing countries, where these are already overburdened. . Diabetes is the leading cause of blindness in the world and early detection of retinopathy is paramount in preventing unwanted sequelae.

The use of a non-mydriatic fundus camera to screen for diabetic retinopathy in a diabetes clinic was evaluated in this study. The aim was to establish the number of patients assessed as having severe retinopathy requiring urgent referral to Ophthalmology. Furthermore, preventing overburdening of an under-resourced service..

METHODS
This is a retrospective descriptive study. Approval was obtained from the Health Research Ethics Committee (Ethics Reference Number S21/08/156) of Stellenbosch University.
The study population included patients with Type 1 diabetes, or other auto-immune diabetes who underwent digital retinal screening done during a 6-month period from Sept 2019 to March 2020. Screening was performed by a single medical officer. An ophthalmology registrar was available to discuss the retinal photos with concerning features.

RESULTS
A total 180 patients were included in the study. The majority had Type 1 DM (n=153, 86.4%) with latent auto-immune diabetes (LADA) accounting for the rest (n=24, 13.6%). Severe retinopathy was detected in 7.9% of patients (n=14). Normal screening or only mild disease were detected in 78% (n=138) and 7.9% (n=14) respectively, with moderate disease in 2.8% (n=5). . Maculopathy was found in 2.3% (n=4) and cataracts in 1.3% (n=2). . This resulted in 79.43% (n= 139) of patients not referred to the ophthalmology service. Patients were appropriately referred urgently in 2.8% (n= 5), and routinely in 17.71% (n=31).

CONCLUSION
The use of a non-mydriatic fundus camera to detect retinopathy in a diabetes clinic is highly effective in ensuring only appropriate referral to Ophthalmology and preventing unnecessary hospital visits for patients.

55

A macrophage-based cell therapy approach for the treatment of non-healing diabetic wounds

Miss Kiara Boodhoo[1], Prof Carine Smith[1], Dr Mari Van de Vyver[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Miss Boodhoo is currently completing her PhD in Internal Medicine with a research focus on macrophage-based cell therapy. She completed her BSc (Biochemistry and Genetics) and BSc Honours (Biochemistry) degrees at the University of KwaZulu-Natal. She went on to complete her MSc (Physiology, Cum Laude) at Stellenbosch University and won the "Best innovative method" prize at a Physiological Sciences in Southern Africa conference. Her research was recently published in an international peer-reviewed scientific journal. This led to another publication, in which she is co-author, that is considered significant by the international journal Stem Cells and Development.

Non-healing diabetic wounds are the leading cause of lower limb amputations globally and often leads to death in Diabetic patients. Persistent inflammation and lack of progression through phases of healing are characteristic of diabetic wounds, with no effective treatments currently available. It is hypothesized that introduction of M2-proregenerative macrophages that are refractive to pathological environment into chronic wounds could improve healing outcomes by dampening inflammatory responses and triggering proliferative stages of healing to commence. Given the plasticity of macrophages to switch phenotype, we propose to generate a macrophage line that is unable to produce proinflammatory TNF-α. This study describes the optimization of a CRISPR-Cas9 protocol to genetically manipulate (knock-out TNF-α) THP-1 monocytes, prior to differentiation of these cells into macrophages. It is very difficult to genetically manipulate mature macrophages via transfections, since the macrophage recognizes the virus and destroys it via phagocytosis preventing insertion into DNA. In this study, we attempted to optimize the transfection of THP-1 monocytes prior to differentiating them into M2 macrophages. The effectiveness and persistent functionality of this approach will be evaluated by stimulating these cells with diabetic wound fluid in vitro and assessing their phenotype and cytokine responsiveness.

153

The role of the bone marrow examination in establishing the cause of cytopenias in HIV-infected patients

Carissa Chetty[1]
[1]*NHLS, Cape Town, South Africa*

Biography:
Carissa Chetty is a registrar in the division of Haematological Pathology at the NHLS, Tygerberg Hospital. She recently completed her FC Path (SA) Haem examinations.

Background: Bone marrow examination (BME) is a reliable and effective tool in the diagnosis of many haematological and non-haematological diseases and may be used to investigate unexplained cytopenia in human immunodeficiency virus (HIV) infected patients. Increased availability of antiretroviral therapy over the years may have changed the spectrum of bone marrow pathology affecting people living with HIV.
Objective: To determine the diagnoses made, diagnostic yield and unique diagnostic yield of BMEs performed to investigate cytopenias in HIV infected patients.
Method: A retrospective cross-sectional descriptive study was performed involving all BMEs performed on HIV-infected adult patients with the main indication of unexplained cytopenia over a period of 5 years and 4 months. Data was extracted from the National Health Laboratory Service's laboratory information system and clinicians' BME request forms.
Results: The study included 128 BMEs, performed on 124 patients. The diagnostic yield was 32% and the unique diagnostic yield was 30.5%. The most common diagnosis was pure red cell aplasia (10.9%), followed by immune thrombocytopenic purpura (ITP) (7%), iron deficiency anaemia (6.3%), malignancy (4.7%) and disseminated infection (3.9%).
Conclusion: BME is a useful diagnostic investigation for unexplained cytopenia in HIV-infected patients. Less invasive investigations to exclude haematinic deficiencies, haemolysis and sepsis are recommended on an individualised basis prior to BME. In HIV-infected patients with therapy refractory ITP or ITP with atypical clinicopathological findings, BME is strongly recommended. As Mycobacterial and other infections are common in this group of patients, staining and culture of specimens are strongly advised if BME is undertaken.

15

Hypoglycaemia due to insulin therapy for the management of hyperkalaemia in hospitalised adults: a scoping review

Dr Yazied Chothia[1], Dr Toby Humphrey, Mrs Anel Schoonees, Professor Usuf Chikte, Professor Razeen Davids
[1]*Division Of Nephrology, Cape Town, South Africa*

Biography:
Dr Chothia is a nephrologist at Stellenbosch University. He received an award from Stellenbosch University for the bedside teaching of undergraduate students. He is an active researcher and is completing his PhD which focuses on "Improving the emergency management of hyperkalaemia". He is an executive committee member of the South African Nephrology Society and a member of the African Association of Nephrology Research and Ethics committee. He is a certified mentor for the International Society of Nephrology and has been awarded an Editorial fellowship with the African Journal of Nephrology.

Introduction
Hyperkalaemia is a very common electrolyte disorder in hospitalised patients. Although hypoglycaemia is a frequent complication of insulin therapy, it is often under-appreciated. We conducted a scoping review of this important complication, and of other adverse effects, of the treatment of hyperkalaemia to map existing research and to identify any knowledge gaps.
Methods
We followed the PRISMA-ScR guidelines. Studies were eligible for inclusion if they reported on any adverse effects in hospitalised patients, with hyperkalaemia receiving treatment that included insulin. All eligible research from 1980 to 12 October 2021 were included. We searched Medline, Embase, Cochrane Library, CINHAL, Africa-Wide Information, Web of Science Core Collection, LILACS and Epistemonikos. The protocol was prospectively registered with the Open Science Framework
Results
Sixty-two articles were included. The prevalence of hypoglycaemia by any definition was 17.2%. The median timing of hypoglycaemia was 124 minutes after insulin administration (IQR 102–168 minutes). There were no differences in the prevalence of hypoglycaemia when comparing insulin dose (<10 units vs. ≥10 units), rate of insulin administration (continuous vs. bolus), type of insulin (regular vs. short-acting) or timing of insulin administration relative to dextrose. However, lower insulin doses were associated with a reduced prevalence of severe hypoglycaemia (P = 0.02). There was no difference regarding prevalence of hypoglycaemia by dextrose dose (≤25 g vs. >25 g); however, prevalence was lower when dextrose was administered as a continuous infusion compared with bolus administration (3.3% vs. 19.5%, P = 0.02). The most common predictor of hypoglycaemia was the pre-treatment serum glucose concentration (n=13 studies).
Conclusion
This is the first comprehensive review of the adverse effects following insulin therapy for hyperkalaemia. Hypoglycaemia remains a common adverse effect in hospitalised adults. Future randomised trials should focus on identifying the optimal regimen of insulin therapy to mitigate the risk of hypoglycaemia.

139

The answer lies in the genome: A case report of GATA2 deficiency

Dr Helena Cornelissen[1,2], Dr Fatima Bassa[1,3], Dr Katherine Hodkinson[2,4], Dr Tracey Wiggill[2,4], Prof Michael Urban[1,5], Dr Semira Irusen[1,3], Dr Fatima Fazel[1,3], Dr Zivanai Chapanduka[1,2], Dr Erica Nell[1,2]

[1]Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Services, Cape Town, South Africa, [3]Division of Clinical Haematology, Department of Internal Medicine, Cape Town, South Africa, [4]Department of Molecular Medicine and Haematology, Faculty of Health Sciences, University of the Witwatersrand, Johannesbug, South Africa, [5]Division of Molecular Biology and Human Genetics, Cape Town, South Africa

Biography:

Helena Cornelissen is a registrar in Haematopathology at Tygerberg Hospital. After completing her internship at Frere Hospital in East London she went on to do her community service year in Microbiology/Immunology at Tygerberg Hospital. Here her interest in laboratory medicine was fostered where she developed a keen interest in haematology. In 2019 she started her training and joined the department of Haematology, National Health Laboratory Services, Tygerberg Hospital.

Introduction: Targeted next generation sequencing (NGS) in myeloid malignancies is rapidly emerging as the new standard in diagnostics and may detect germline mutations. Myeloid neoplasms with germline predisposition (MNGP) may present in childhood and adulthood. This case report highlights the importance of clinical suspicion and practical application of molecular diagnostics in haematology.

Case presentation: A 22-year-old Human Immunodeficiency Virus negative male, of mixed race presented with persistent pancytopenia. A Non-tuberculous Mycobacterium (NTM), Mycobacterium intracellulare was cultured. He was BCG vaccinated at birth and cleared a Mycobacterium Tuberculosis Complex infection in childhood with standard therapy. A history of lymphoedema and extensive persistent verruca vulgaris since his mid-teens was noted. Despite optimal treatment of the NTM, pancytopenia persisted. Bone marrow biopsies were in keeping with myelodysplastic syndrome with multilineage dysplasia. The karyotype and MDS FISH panel were normal. NGS analysis using the Ion Torrent Oncomine™ Myeloid Assay revealed a GATA2 mutation [p.(R337*) c.1009C>T, COSM6022403], confirmed as germline on skin biopsy.

Discussion: High allelic frequency mutations identified on somatic NGS panels in genes associated with MNGP (CEBPA, RUNX1, ETV6 and GATA2) require further delineation for exclusion of a germline variant. Patients with germline GATA2 mutations are immune deficient with a 50% risk of developing a myeloid neoplasm. Median age of onset is 20 years, often with NTM, viral infections, lymphoedema and cytopenias particularly monocytopenia.

Conclusion: Severe, persistent or recurrent cytopenia(s) should prompt further haematological investigation. In younger patients there should be a high index of suspicion for germline predisposition to a myeloid neoplasm.

72

An investigation into the temporal effects HIV and ART on retinal vessel branching features in an HIV-positive on ART Western Cape study population.

Dr. Frans Everson[1], Boipelo Kgokane[1], Dr. Ingrid Webster[1], Dr. Amanda Genis[1], Yushra Dinnie[1], Jody Abrahams[1], Prof. Hans Strijdom[1]

[1]Centre for Cardio-metabolic Research in Africa, Division of Medical Physiology, Stellenbosch University, South Africa. , Cape Town, South Africa

Biography:

The presenter is a postdoctoral research fellow in the Centre for Cardio-metabolic Research in Africa, Division of Medical Physiology, Stellenbosch University, South Africa. His study focus is cardiovascular disease and HIV/AIDS.

BACKGROUND:

The analysis of retinal vessel branching features (markers of blood circulation effectiveness) has shown promise in cardiovascular risk prediction; however, its value in the context of HIV and antiretroviral therapy (ART) is largely unknown. The current study aimed to investigate whether HIV and/or ART are associated with vessel branching features in an HIV-positive Western Cape study population on ART.

METHODS:

The longitudinal repeated measures study (baseline vs. 18-month, n=82) recruited volunteering participants from the Worcester area. Demographic, lifestyle, and anthropometric data were collected. Fasting blood and urine samples were sent for biochemical analyses at the NHLS. Retinal images were captured (Canon CR-2 camera) and analysed (MONA REVA 2.1.1 software). Linear mixed model analyses (adjusting for confounding factors) were applied. Statistical significance was set at $p<0.05$.

RESULTS:

The study population (mean±SD age: 41.1±9.0 years) presented with a successfully suppressed median (range) viral load (50 (10 to 675032) copies mRNA/mL) and a mean±SD CD4 cell count within acceptable range (511.3±228.9 cells/mm3). A total number of n = 47 (57.3%) study participants were HIV-positive ≥5 years. Following linear mixed model analyses, HIV duration (≥ 5 years vs. < 5 years) was associated with a -7.154 (95%CI: -14.189 to -0.120) µm change in mean arteriolar diameter of the mother vessel (D0, p=0.046), a -7.329 (95%CI:-13.048 to -1.611) µm change in mean arteriolar diameter of daughter vessel 1 (D1, p=0.012) and a 11.804 (95%CI:3.024 to 20.584) increment change in mean venular angular asymmetry (p=0.009).

CONCLUSION:

The current study showed that an HIV-duration of (≥ 5 years) is associated with smaller mean vessel branching diameters and more asymmetrical venular branches. As retinal vessel branching features are markers of the effectiveness of blood circulation, these results suggest that a longer HIV-duration is associated with less effective blood circulation.

171

Evaluation of a new technique for quantitation of plasma cells in bone marrow biopsies.

Dr Ethan Gantana[1], Dr Nomusa Mashigo[1], Dr Ibtisam Abdullah[1], Dr Ernest Musekwa[1], Dr Robert Lohlun[1], Dr Erica-Mari Nell[1], Dr Carissa Chetty[1], Dr Monalisa Ntobongwana[1], Dr Zivanai Chapanduka[1]
[1]*Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:
Ethan Gantana graduated from Stellenbosch University in 2015 and joined the division of haematology pathology as a registrar in 2019.

Aim:
To compare the frequently used CD138 immunohistochemistry-based method of plasma cell quantitation, to a proposed new method, using inter-observer and intra-observer concordance parameters.
Methods:
Archival CD138 immunohistochemically-stained slides made from paraffin-embedded bone marrow biopsies of 33 patients with a confirmed diagnosis of multiple myeloma were used. Light microscopic examination was performed using low magnification lenses (10×) for both the overview estimation method (method A) and the new method (method B), and high magnification lenses (50×), for method B only. For method B, reviewers selected three areas with low, intermediate, and high plasma cell tumour burdens using 10× lenses. Using a well-defined technique, the 50× lens was then used to count plasma cells as a percentage of all nucleated cells. After blinded re-labelling of all the slides, the nine reviewers repeated the plasma cell quantitation using both methods. The plasma cell counts were obtained, and the review times were recorded.
Results:
Overall intraobserver concordance was comparable for method A (concordance correlation coefficient (CCC)=0.840) and method B (CCC=0.733). Interobserver concordance for method A (intraclass correlation coefficient (ICC)=0.793 and 0.713) and method B (ICC=0.657 and 0.658) indicated high similarity between reviewers. Method A showed poor interobserver concordance (ICC=0.105) at low plasma cell densities.
Conclusions:
The new method is comparable to the frequently used overview estimation method in terms of intraobserver concordance, interobserver concordance and cost. The new method has superior interobserver concordance at low plasma cell densities. The new method appears more amenable to digital scanning and analysis.

83

Establishment of a H9c2 cardiomyoblast spheroid model

Mr Barend Jacobus Groenewald[1], Dr Nireshni Chellan, Prof Barbara Huisamen, Dr Marguerite Blignaut
[1]*Stellenbosch University, Bellville, South Africa*

Biography:
I received both my BSc in Human Life Sciences and BScHons in Medical Physiology at the University of Stellenbosch and I am currently busy with my MSc in Medical Physiology at the University of Stellenbosch. My honours project was focused on assessing the potential of a 3D in vitro liver spheroid model as a potential to assess drug induced hepatotoxicity. My interest in spheroids continues in my masters project where I am focused on establishing and characterizing a cardiac spheroid model to be used as a high throughput model for potential pharmaceuticals related to non communicable diseases.

BACKGROUND
Three-dimensional (3D) in vitro models recapitulate in vivo conditions better than traditional monolayer cell cultures, making 3D models optimal for high-throughput drug screening. Currently, all 3D cardiac cultures make use of pluripotent stem cells with limited use as a high throughput system due to cost and difficulty in differentiating and culturing these cells.

OBJECTIVES
This study aims to establish a high-throughput model with the commercially available rat ventricular cardiomyoblast cell line, H9c2. Seeding concentration, time to physiological stability, cell death and response to external stimuli (i.e., insulin) will be determined.

METHODS
To determine seeding concentration, cells were seeded at 10 000, 20 000, 30 000 and 40 000 cells/spheroid in a 96-well Ultra-low attachment plate and imaged every 24 hours over a total period of 96 hours. In separate experiments, a seeding concentration of 20 000 cells/spheroid was used to determine surface cell death with propidium iodide (fluorescent microscopy, n=3) and metabolic response to 100 nM insulin stimulation with Western blotting (n=3).

RESULTS
After 96 hours, the 20 000 cells/spheroid reached a surface area of 113 608 µm2 (n =3; 20 spheroids per experiment). Fluorescence microscopy showed a lower degree of cell death when compared to spheroids treated with 10% DMSO as a positive control. Insulin treated spheroids had increased phosphorylated PKB levels compared to untreated spheroids (n = 20 spheroids).

CONCLUSION
We were able to establish and partially characterise a H9c2 spheroid model that is physiologically stable after 96 hours and metabolically responsive.

181

A Killian-Jamieson diverticulum potentially mimicking a thyroid nodule: A case report highlighting the cytology of a pharyngoesophageal diverticulum.

Mr Yusuf Docrat[1], Dr Wilhelmina Conradie[2], Dr Razaan Davis[3], Dr Rubina Razack[1]

[1]Division of Anatomical Pathology, Department of Pathology, National Health Laboratory Service, Faculty of Medicine and Health Sciences, Tygerberg Hospital and Stellenbosch University, Cape Town, South Africa, [2]Division of General Surgery, Department of Surgery, Faculty of Medicine and Health Sciences, Tygerberg Hospital and Stellenbosch University, Cape Town, South Africa, [3] Division of Radiodiagnosis, Department of Medical Imaging and Clinical Oncology, Faculty of Medicine and Health Sciences, Tygerberg Hospital and Stellenbosch University, Cape Town, Cape Town, South Africa

Biography:

Yusuf Docrat is a final year medical student taking a keen interest in surgery, research, biotechnology and the application of technology and artificial intelligence to medical practice. He currently serves as a student ambassador for UK-based edu-tech start up, SurgicalTeaching, and is a peer reviewer and contributor to Neuro_Qual, a qualitative research resource designed by the NIHR Global Health Research Group on Neurotrauma, based at Cambridge University/Addenbrooke's Hospital, UK. He has previously served on the executive committees of the SU Surgical Society, Friends of MSF Stellenbosch and IFMSA Standing Committee on Medical Education (Stellenbosch Chapter).

Background

Pharyngoesophageal diverticula (PED) can mimic thyroid nodules clinically and sonographically. This case report demonstrates the utility of rapid on-site evaluation of fine needle aspiration biopsy (FNAB) of a tentative thyroid lesion. By identifying key cytological features, the cytopathologist could immediately guide further management.

Case-History

A 46-year-old male presented with a tender midline neck abscess, a normal thyroid gland and no other clinical abnormalities. The abscess resolved with antibiotics. Ultrasound of the neck revealed a cystic midline lesion suggestive of a thyroglossal duct cyst and a well-defined, hypoechoic structure, initially interpreted as a posterior thyroid nodule which was aspirated. Cytology was suggestive of a PED. Further imaging studies with a barium swallow confirmed the diagnosis of a Killian-Jamieson diverticulum.

Conclusion

PEDs are rare. Awareness of the pitfalls of presentation, imaging and diagnosis is important across disciplines. This case report emphasises the value of clinic-pathological and radiological correlation and the value of working in a multidisciplinary team.

134

The effects of high-fat and elevated-sugar diets on the adipogenic potential of bone derived mesenchymal stromal cells

Miss Kayla Howard[1], Prof William Ferris[1]
[1]*Division of Clinical Pharmacology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town,, South Africa*

Biography:
Kayla Howard is a PhD student registered under the Department of Medicine at Stellenbosch University. Kayla's research mainly focuses on determining which population of bone mesenchymal stromal cell may contribute towards the development of adipose tissue within the bone marrow cavity.

Mesenchymal stromal cells (MSCs) are multipotent progenitor cells embedded in several tissues within the body, including bone and can be differentiated into various lineages such as adipocytes and osteoblasts. Adipocytes found within the bone marrow are termed bone marrow adipocytes (BMA) which stores excess energy in the form of triglycerides and exhibit a beige-like adipocytic phenotype. Metabolic syndromes and high-fat diets have been known to promote changes within the bone marrow microenvironment including the expansion and whitening of the beige-like adipocytes within the bone marrow. These changes may result from the promotion of adipogenesis at the expense of osteogenesis thus potentially reducing the bone mineral density (BMD). Currently, it is not known which population of bone MSCs are influenced by metabolic syndromes, high-fat, and elevated-sugar diets.

Thirty male Wistar rats were fed either a standard control- (n=10), high-fat- (n=10) or elevated-sugar (n=10) diet for 16 weeks. Bone MSCs were isolated and characterized from the bone marrow, femoral diaphysis, and femoral epiphysis of these rats. The differentiation potential was assessed by differentiating bone MSCs into adipocytes and staining for intracellular lipid accumulation.

After 16 weeks of the respective diets, animals fed either a high-fat or an elevated-sugar diet developed significantly more visceral fat in comparison to control animals. Bone marrow MSCs extracted from animals fed an elevated-sugar diet significantly accumulated more lipids when differentiated into adipocytes compared to bone marrow MSCs from control and high-fat diet fed animals, despite no significant changes in the fasting blood glucose in any of the animals.

Our findings indicate that the bone microenvironment may be influenced by elevated-sugar diets prior to the onset of obesity or type 2 diabetes. The shift in fat accumulation from subcutaneous to visceral depots of the diet animals may promote bone marrow MSCs to become more sensitive to adipocyte differentiation.

193

A retrospective audit of young adults who received permanent pacemakers.

Miss Elrike Hugo[1,2], Prof Anton Doubell[3], Mr Jan Steyn[2], Dr Jane Moses[3]
[1]Department of Health Sciences, Faculty of Health and Environmental Sciences, Central University of Technology, Bloemfontein, South Africa, [2]Division of Cardiology, Department of Medicine, Tygerberg Hospital, Cape Town, South Africa, [3]Division of Cardiology, Department of Medicine, Stellenbosch University, Tygerberg Hospital, Cape Town, South Africa

Biography:
I am currently a final year student studying Bachelor of Health Sciences in Clinical Technology (Cardiology) at the Central University of Technology, Bloemfontein. I am completing my Work Integrated Learning (WIL) in the Division of Cardiology, Department of Medicine, Tygerberg Hospital, Cape Town.

Background: While most pacemaker implantations occur in older individuals, younger patients also receive pacemakers. In these individuals, degenerative conduction system disease is less likely to be the cause of atrioventricular block (AVB) with other diseases being more common. There is, however, a paucity of data on this group regarding the indication for pacemaker implantation.

Objectives: The objectives of the study were to investigate first time adult permanent pacemaker recipients 60 years or younger and to determine their clinical profile, indication for pacemaker implantation and underlying pathologies identified.

Method: This was a retrospective record review, conducted in the Division of Cardiology at Tygerberg Hospital, Cape Town, South Africa. We included 148 adult patients between the ages of 18 and 60, who received permanent pacemakers between 2010 and 2020.

Results: The mean age was 50 years. Third degree AVB was the most common indication (n=105; 70.9%). No specific underlying cause was found for the majority of patients (n=108; 73%). Identifiable causes included prosthetic valve implantation and/or valve repair (n=14; 9.5%), myocardial infarction (n=6; 4.1%), cardiac sarcoidosis (n=5; 3.4%), coronary artery bypass grafting (n=3; 2%), previous arrhythmia ablation (n=2; 1.4%), cardiomyopathies (n=2; 1.4), muscular dystrophy (n=2; 1.4%), congenital heart disease (ventricular septal defect/atrioventricular septal defect) (n=2; 1.4%), acute myocarditis (n=1; 0.7%), atrial myxoma removal (n=1; 0.7%), planned AV node ablation (n=1; 0.7%), and following a previous stab in the chest (n=1; 0.7%).

Conclusion: In this retrospective cohort, the most common indication for pacemaker implantation was third degree AVB. A specific underlying cause was found in 27% of patients, potentially identifying these patients as needing other medical therapy or more frequent follow-up. As access to advanced diagnostic tools improves, this percentage may increase.

242

Screening and characterization of BCR-ABL1 kinase domain mutations in Chronic Myeloid Leukaemia patients at Tygerberg Hospital – Secondary mutations, drug resistance and associated problems

Dr Jurie Jordaan[1], Dr Zivanai Chapanduka[1,2], Mr Faghri February[3], Dr Fatima Bassa[1,2], Dr Dominique Anderson[4], Dr Carmen Swanepoel[1,2]

[1]Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Service, Cape Town, South Africa, [3]University of Cape Town, Cape Town, South Africa, [4]University of Western Cape, Cape Town, South Africa

Biography:

Shareefa Isaacs is a Masters student in the division of Haematological Pathology, focusing on the molecular pathology of Cancers

Background: To date, an increased number of drug resistant cancers have been observed. The underlying mechanisms are not well understood; therefore, we use Chronic Myeloid Leukaemia (CML) as a disease model to explore the type and frequencies of potential drug resistant causing mutations and the effect on survival.
Material and Methods: A retrospective audit was conducted on a CML cohort from 2013 to 2020 and 25 of these patients samples were used for detection of KD mutations, spanning exon 4 -10 of the ABL1 oncogene. Peripheral blood from routine Xpert BCR-ABL diagnostic screening by the NHLS Molecular Haematology diagnostic laboratory were obtained for the mutation detection assay via bi-directional Sanger Sequencing Identified mutations, were subjected to bioinformatic analysis to investigate protein and consequent pathway effects.
Preliminary Results: For the audit, a total of 165 patients with confirmed CML treated at TBH was captured. Descriptive statistics showed 46.1% of CML patients were female, and 53.9% were male. The patients were from 69 different areas in the Northern district of Western Cape. Quantitative analysis showed the youngest patient was two years old and the oldest was 88 years old, $\bar{x}$ = 45-46 years. We found a weak linear correlation between age and severity of disease. A significant difference of $p < .000$ was seen in patients on treatment after 1 year. Of interest's sake, 104 of the initial 164 patients who were diagnosed were still
undergoing treatment, a correlation coefficient of -0.77. A total of 57 patients presented with possible resistance; 75% were categorized as failure and 25% at warning stage according to ELN guidelines. In the second part of the study, 189 samples were analysed for mutation detection. Sequence analysis showed potential interesting variants in Exon 4 and 9 of the ABL gene. Bioinformatic analysis is currently underway.

223

VARIATION IN DIAGNOSTIC REQUESTS AND OUTCOMES FOR HEREDITARY THROMBOPHILIA - OVER TESTING AND UNDER TESTING

Dr Jurie Jordaan[1], Miss Shafieka Isaacs[1], Dr Nomusa Mashigo[1,2], Dr Wardah Cerfontein[1,2], Dr Carmen Swanepoel[1,2], **Dr Juhan Jordaan[1]**

[1]Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Services, Cape Town, South Africa

Biography:

Dr Jurie (Juhan) Jordaan obtained his MB,ChB degree from Stellenbosch University in 2013. After internship and community service he worked at Cape Town International Airport as a Flight Doctor and Helicopter Hoist Operator. Currently he is involved in clinical trials and also works as a part time research assistant in the Division of Haematological Pathology. Dr Jordaan has a special interest in biochemistry and molecular pathology.

Heritable thrombophilia is a multiple gene disorder with high mortality and morbidity. Genetic risk factors associated with Venous Thromboembolism have been linked to mutations in the genes of the coagulation/anticoagulation system. The more prevalent inherited risk factors are the gain-of-function mutations in coagulation factors V and II, namely factor V-Leiden (FVL and/or F5G1691A (FVR506Q,)) and prothrombin/Factor II (FII) F2G20210A. The epidemiology of the FVL and FII mutations has not been well studied within either the South African or African context.

Therefore, a retrospective audit was conducted to determine the total number of FVL and FII tests requested by clinicians and the prevalence of FII mutations in our setting at Tygerberg Hospital for an 11-year period. (2007-2017). In addition, 50 of these patients' samples was selected randomly for the screening of a novel gain of function mutation Prothrombin Yukuhashi c.1787G>T in exon 14 of FII gene. Peripheral blood samples were received, by the NHLS Molecular Haematology diagnostic laboratory from clinicians requesting the FII and FVL assay. Exon 14 of the FII gene was amplified using reference primers and verified by PCR followed by Bidirectional sequencing to identity the presence of the mutation. Statistical analysis of all data was performed with the help of a statistician.

For the audit, 80.4% of the requests were for FVL, 3.8% were for FII and 15.8% of the requests were for FVL and FII together. The most tests were requested during 2013 when the implementation of a multiplex assay occurred. The mutational frequency for FVL was shown to be 3.3%, compared to FII which was 6.9%.

The frequency of the FII mutation was more than double that of the FVL mutation, despite more than 80% of requests being for FVL alone. The study also showed that the Prothrombin Yukuhashi mutation was not prevalent in our cohort.

74

Radiolabelling of Chelators DOTA, EDTA and DTPA with Gallium-68

Dr Jurgens Van Zyl[1,3], Dr Jannie Le Roux[2], Prof Sietske Rubow[1], Dr Janke Kleynhans[1]
[1]Division of Nuclear Medicine, Stellenbosch University, Cape Town, South Africa, [2]NuMeRI NII, Cape Town, South Africa, [3]Axim Nuclear & Oncology, Midrand, South Africa

Biography:
Dr Jurgens van Zyl is currently working at AXIM Radiopharmaceuticals performing the scope of practice of a Radiopharmacist. His research area as part of his MSc and PhD was mainly focused on molecular and behavioral pharmacology working with rodent models of depression/anxiety. He recently enrolled for a second MSc, in Nuclear Medicine, and continue acquiring skills useful for research and the clinical field of nuclear medicine.

The use of [68Ga]Ga-EDTA and [68Ga]Ga-DTPA in cisternography studies were previously investigated. The procedure would be using PET/CT imaging of the basal cistern of the brain after subarachnoid injection of a PET radiopharmaceutical. Currently, no PET radiopharmaceutical exist for clinical use. Studies are needed to evaluate the role of 68Ga-radiolabelled chelators in cisternography that may provide a more informed selection based on radiation safety and type of study. The safety aspects are important for this application and methods needs to be develop to determine when a formulation is acceptable for intrathecal administration.

The study aim was to validate iTLC and HPLC methods to determine radiopharmaceutical purity.Chelators DTPA, EDTA and DOTA was radiolabelled at a temperature of 95°C for 10 min with gallium-68 obtained from an iThemba LABS Generator. Radiochemical purity was determined by a method adapted from Gündel et al. 2018 which was validated in-house. A two-strip SG-iTLC method was used with a range of concentrations for acetonitrile and TFA as a mobile phase to elute [68Ga]Ga -EDTA and [68Ga]Ga -DOTA and [68Ga]Ga -DTPA. The iTLC strip was scanned using a Scan-RAM radio TLC scanner (Lablogic, UK) with a PMT/Plastic Scintillator detector for high energy beta radionuclides. A concentration of 50% acetonitrile and 4% TFA resulted in optimal resolution for [68Ga]Ga -EDTA and [68Ga]Ga -DOTA and 20% acetonitrile and 4% TFA for [68Ga]Ga -DTPA. A radiolabelling pH < 4.5 decreased radiolabelled [68Ga]Ga -DOTA and increased free Ga-68 as showed by iTLC analyses. The radio-iTLC method was optimized under current radiolabelling conditions with separation of colloids, free galium-68 and radiolabelled chelators. HPLC analyses may require a different selection of mobile phases for the separation of radiochemical species. Formulation issues relevant to intrathecal administration of radiopharmaceuticals will be addressed for future studies.

77

A case report of the effect of low molar activity of [177Lu]Lu-DOTA-TATE on accumulation at the tumour target site

Ms Tessa Jordaan[1], Prof Sietske Rubow[1], Prof Annare Ellmann[1], Dr Janke Kleynhans[1]
[1]*Division of Nuclear Medicine, Stellenbosch University, , South Africa*

Biography:
Ms Tessa Jordaan matriculated in 2017 with 4 distinctions. She obtained her B.Pharm at North-West University in 2021. She has a passion for science and chose Radiopharmacy because of an intrest in oncology. She also rotates shifts at Fagron Compounding Pharmacy involved in the manufacturing of individualized dosages per patient. She enrolled in the MSc in Radiopharmacy January 2022.

Lutetium-177 is a radionuclide that is coupled to a targeting vector (eg somatostatin for neuroendocrine tumour treatment) and irradiates cells upon accumulation. There are two commonly used production methods for lutetium-177, namely the direct reactor method (resulting in lutetium-177 carrier-added or c.a.) and the indirect reactor method (resulting in lutetium-177 no-carrier-added or n.c.a). The specific activity (amount of activity per gram of substance) of lutetium-177 c.a. is lower than that of lutetium-177 n.c.a. A higher spesific activity leads to a higher molar activity (radioactivity per mole of pharmaceutical) in the final product. The higher the molar activity the more favourable the saturation, competition and internalization at the receptor will be. A high molar activity is therefore preferred. The purpose of this case report is to present a clinical case study demonstrating the difference between [177Lu]Lu-DOTATATE n.c.a and [177Lu]Lu-DOTATATE c.a.

A patient with a metastatic, well differentiated neuroendocrine tumour of the small bowel, received [177Lu]Lu-DOTATATE n.c.a in the 2nd treatment cycle, [177Lu]Lu-DOTATATE c.a in the 3rd treatment cycle and [177Lu]Lu-DOTATATE n.c.a in the 4th treatment cycle. The c.a. radiopharmaceutical was ordered during n.c.a. supply chain shortages experienced during the covid pandemic. However, it was observed that a clear lack of accumulation is present at the target site during post-administration SPECT-CT. A comparison between the 2nd cycle, 3d cycle and 4th cycle scans are presented.

[177Lu]Lu-DOTATATE n.c.a is therefore the radiopharmaceutical of choice because it can be used without special consideration in the PRRT due to a high specific activity. Using [177Lu]Lu-DOTATATE c.a. can be problematic with the peptide that can only be administered due to side-effects of receptor saturation.

78

Optimization of the dicentric chromosome assay for caclculating DNA strand breakage after [177Lu]Lu-DOTA-TATE administration

Ms Nastassja Combrink[1,2], Dr Julie Bolcaen[2], Dr Janke Kleynhans[1]
[1]Division of Nuclear Medicine, Stellenbosch University, , South Africa, [2]Radiation Biophysics Division, SSC Laboratory iThemba LABS, Cape Town, South Africa

Biography:
Ms Nastassja Combrink matriculated in 2017 and obtained her B.Pharm degree in 2021 at the North-West University (Cum-Laude). She has a keen interest in science and enrolled for a MSc in Nuclear Medicine with the focus in Radiopharmacy, January 2022. She obtained a sponsorship for her studies from SAINTS Prestigious Masters Scholarships based on merit. She has a keen interest in Radiobiology.

DNA is recognised as one of the principal targets to study the biological effects of ionizing radiation (IR). IR leads to DNA single-strand breaks, double-strand breaks (DSBs), base damage and DNA-protein crosslinks. DSBs predicts better therapeutic efficacy. The dicentric chromosome assay (DCA) is the gold standard in biodosimetry to score dicentric chromosome aberrations (DIC) in human lymphocytes. The presence of DIC is considered to be specific to radiation exposure. The DCA is a well-established biodosimetry technique to estimate the absorbed radiation dose after radiation exposure.

Our first step was to optimize the DCA protocol. The aim of this study was to determine the number of metaphases as a function of colcemid concentration while avoiding problems of cell toxicity at high concentrations. The purpose of this optimization is to calculate the number of DICs in patients treated with [177Lu]Lu-DOTA-TATE for neuroendocrine tumour(s) and correlate it with the physical dosimetry.

Whole blood samples were collected from healthy volunteers and irradiated with cobalt-60 γ-rays (1.173 and 1.332 MeV) at doses of 0 and 2 Gy at iThemba LABS (Cape Town, South Africa). The DCA protocol described by the IAEA (2011) was applied with some adaptations, as described. A metaphase arresting agent, colcemid (10 µg/ml stock solution), was tested at two concentrations (25 vs 50 µl) in order to assess DIC. The incubation time was fixed at 48 hours. The DIC in metaphase spreads of human lymphocytes were captured and enumerated using a Metafer 4 platform.

For a sufficient number of metaphase spreads, a colcemid concentration between 25 µl - 50 µl is appropriate. This ensures that the cells are arrested during metaphase to score the number of DICs. We observed a significant number of metaphases in cultures A and B with 25 µl and 50 µl colcemid, respectively.

163

STABILITY OF ION SELECTIVE ELECTRODE FOR CHLORIDE MEASUREMENT ON ROCHE COBAS® 6000 C501 SYSTEM

Dr Elsie Kruger[1], Dr Morné Bezuidenhout[1], Prof Annalise Zemlin[1]
[1]*NHLS and SU, ,*

Biography:
Dr Kruger is a Consultant Chemical Pathologist in the Division of Chemical Pathology. She has a special interest in clinical audits.

Background:The manufacterer (Roche) of the ion selective electrode (ISE) for sodium, potassium and chloride claims the onboard stability is 2 months or 9000 total number of tests. However, frequent negative trends and unexplained hypochloraemia was observed in patient results and stability of the chloride electrode was thus questioned. The laboratory changes the iSE every 4 weeks, as serum electrolytes are requested as a profile test amounting to 34000 tests per month. This study aimed to determine if monthly replacement of the chloride ISE is adequate for its stability.
Methods: The Roche cobas® 6000 c501 system has two ISE's in use (Line A and B). The stability of each for serum chloride was tested over one month. Four healthy volunteers were selected and 30 serum aliquots were prepared separately for each, one for each day of the month. Tests were performed in duplicate on both lines as part of routine runs and the results were analysed for trends. The stability was calculated as bias% between assigned mean and cumulative mean, and compared to the reference change value (RCV) for chloride of 6,97%.
Results: The total number of chloride tests performed in this study was 480. The total number of chloride tests performed for the month on the ISE was 14310. The volunteers' results demonstrated negative trends on both lines with the bias% on line A and B respectively -6,5% and -5,3%, although these were below the RCV for serum chloride. The internal quality control (IQC) trends of the same month also demonstrated a negative trend, but with a bias% of -0.47 and -0,77% against target values respectively.
Conclusion: The findings suggest that although the chloride ISE showed deterioration over a one-month period, this is unlikely to affect medical decisions. Patient samples showed more apparent negative trends compared to the IQC material.

173

Factors associated with bone marrow involvement in lymphoma staging bone marrow examination: A South African single-centre retrospective study

Dr Robert Kingsley Lohlun[1], Dr Zivanai Chapanduka[1]
[1]*Department of Haematology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:
Senior registrar in the department of haematopathology

Background: Accurate detection of bone marrow involvement (BMI) in lymphoma is important as it signifies stage 4 disease. Staging bone marrow examination (BME), therefore, influences treatment decisions and prognostication. The prevalence of BMI depends on multiple factors at presentation including lymphoma subtype, age, sex, human immunodeficiency virus (HIV) status and haematological parameters.
Aim: To determine risk factors for BMI in lymphoma staging.
Setting: The study was conducted in the department of haematological pathology, Tygerberg Hospital, Cape Town, South Africa.
Methods: Retrospective cross-sectional descriptive study in adult patients, reviewing BMI and associated parameters, during their initial lymphoma staging procedure between 2016 and 2019.
Results: Of a total of 387 lymphoma staging cases that were evaluated, 30.0% of them showed BMI. Diffuse large B-cell lymphoma, Hodgkin lymphoma and high-grade B-cell lymphoma were the most frequent subtypes diagnosed. The highest prevalence of BMI was in low-grade lymphomas. There was a statistically significant association between BMI and advanced age, pancytopenia and bicytopenia (anaemia with leucopenia, anaemia with thrombocytopenia or leucopenia with thrombocytopenia). Bicytopenia and pancytopenia showed high positive predictive values of BMI, respectively, 61.0% and 69.0%. Human immunodeficiency virus positivity (34.6%) was not predictive of BMI across all lymphoma subtypes. Normal blood counts had a high negative predictive value for BMI.
Conclusion: BME remains an important part of lymphoma staging with 30.0% of all lymphomas showing BMI.

68

Mesenchymal stem cell compatibility with F127 Pluronic hydrogel as drug delivery vehicle in regenerative medicine

Ms Michelle Maartens[1], Miss Lauren Williams[1], Dr Mari van de Vyver[1]
[1]*Division of Clinical Pharmacology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:
Michelle Maartens is a PhD student and intuitive researcher at Stellenbosch University in the Division of Clinical Pharmacology Faculty of Medicine and Health Sciences. Her research focus area is Regenerative Medicine and Type 2 Diabetes Mellitus. She has authored and co-authored research articles published in peer reviewed journals and won best poster presentation at a congress held by the Society of Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA).

Therapeutic advances in stem cell therapy for use in regenerative medicine are limited by the availability of effective delivery systems. Hydrogels are hydrophilic cross-linked polymer structures that have promise as a delivery vehicle for transplantation since they are biodegradable, and their consistency can be tailored to the need of a specific cell type. In this study the ability of Pluronic hydrogel to support stem cell viability, growth and migration was assessed under various conditions. Pluronic F127 hydrogel was prepared with Dulbecco's modified eagle medium or phosphate buffered saline into a stock solution of 30%. The viability and growth rate of mesenchymal stem cells (C3H10T1/2 line) encapsulated in various hydrogel concentrations (0, 5, 10, 15, 20, 22, 25 and 30%) were assessed in vitro to determine an optimal density that supports cellular function. The ability of cells to migrate from the optimal hydrogel concentration was determined with and without incorporation of drugs (N-acetylcysteine (NAC) (7.5nM) and Ascorbic acid-2-phosphate (AAP) (0.5nM)). Hydrogel consistency and time to set differed across hydrogel concentrations tested. Higher concentrations are more viscous and set quicker than lower concentrations. Cellular functionality was influenced by hydrogel consistency with 22% and 25% optimally supporting cellular proliferation and viability. Incorporation of NAC and AAP further improved the proliferation and migration rate of encapsulated cells. Conditions of Pluronic F127 can be optimised to suit cell type. Pluronic F127 hydrogel was demonstrated to support stem cell functionality and could serve as a suitable delivery vehicle for stem cell therapy.

93

The effect of reduced hemodialysis sessions due to covid-19 on nutritional outcomes

Ms Jana Maree[1], Mr Mikyle Rodrigues[1], Ms Thobile Nkabinde[1], Mrs Zarina Ebrahim[1], Mrs Nazeema Esau[2]
[1]Division of Human Nutrition, Stellenbosch University, Northen Suburbs, South Africa, [2]Department of Dietetics, Tygerberg Hospital, Northen Suburbs, South Africa

Biography:
The presenting author is a final year dietetic student and has an interest in the nutritional management of renal patients.

End stage kidney disease (ESKD) requires replacement therapy, such as hemodialysis (HD) to alleviate the nutritional and metabolic complications of the disease. Due to the Covid-19 pandemic, the number of HD treatments at Tygerberg Hospital was reduced from three to two sessions per week. The aim of this study was to investigate the effect of the reduced HD sessions on participants' nutritional outcomes.

This is a cross-sectional study with a retrospective component. Anthropometric and biochemical data of three time points (starting-, mid- and endpoint), were collected and a questionnaire was used to obtain sociodemographic and dietary adherence information.

The study population consisted of 34 participants, of which 59% were female and 41% were male, with a mean age of 41.3± 9.4 years. There was a significant increase in serum sodium levels, which remained higher at the endpoint . Potassium significantly increased from starting to midpoint ($p = 0.015$) and reduced from mid to endpoint . Urea and creatinine both significantly increased after the starting point, whereafter urea significantly decreased at the endpoint and creatinine decreased from mid to end point , it was however significantly higher at the endpoint compared to the starting point . Most participants (73,5%) boiled their vegetables, 47,1% consumed vegetables 1-2 times per week, while 44,1% consumed fruit 1-2 times per week. The majority of participants (94,1%) consumed more than the advised fluid allowance per day. The main symptoms experienced during the lockdown were fatigue, anorexia and muscle cramps.

Biochemical and anthropometric changes were not all substantial from a clinical perspective over time; fluid adherence was low and dietary changes regarding potassium were made. The reduction in hemodialysis sessions may be acceptable to practise for short periods of time, in a pandemic, together with dietary counselling by a registered dietitian.

175

Pathology-supported genetic testing of patients with post-acute sequelae of COVID-19 screened for metabolic syndrome features

Ms Kelebogile Moremi[1], Prof Etheresia Pretorius[2], Dr Chantelle Venter[2], Prof Maritha Kotze[1]
[1]Faculty of Medicine and Health Sciences, Department of Pathology, Division of Chemical Pathology, Stellenbosch University and National Health Laboratory Service, Tygerberg, Cape Town, South Africa, [2]Faculty of Science, Department of Physiological Sciences, Stellenbosch University, Stellenbosch, Cape Town, South Africa

Biography:
I am a nascent researcher and my passion is to drive translational research that integrates pathology and genomic medicine. My function as a medical scientist in the Division of Chemical Pathology married my love for molecular biology and clinical biochemistry, with my current research exploring the intricacy of COVID-19 host-genetics to bridge the gap between lifestyle-related and heritable risk factors for COVID-19 complications.

Background:
Infection with SARS-CoV-2 has given rise to post-acute sequelae of COVID-19 (PASC) in a subset of patients at increased risk of abnormal blood clotting pathology. Detection of microclots was used as a screening step for pathology supported genetic testing (PSGT) aimed at personalized medicine integrating research and service delivery.

Methodology:
Biochemistry tests including lipid levels, iron parameters, vitamins B12 and D and D-dimer were performed in selected cases to facilitate clinical interpretation of single nucleotide variants (SNVs) implicated in COVID-19 severity. During clinical follow-up, the laboratory test results, personal and family history were incorporated into a decision support algorithm to determine the need for extended genetic testing.

Results:
Metabolic syndrome features were reported in 70% of 10 Long COVID/PASC patients screened, including obesity (n=3), dyslipidaemia (n=5) and hypertension (n=3). Functional SNVs in the apolipoprotein E (APOE) gene associated with cholesterol metabolism and COVID-19 severity were detected in five cases. Genetic variation in the Factor V gene and MTHFR-homocysteine pathway was reported in three patients, including 2/3 hypertensives found to be homozygous for the risk-associated MTHFR 677 T-allele. Vitamin B12 (182 pmol/L) and vitamin D (14-16 ng/ml) levels remained low during follow-up in a patient with high serum transferrin saturation levels (72%), which could not be explained by the iron-loading HFE H63D and C282Y SNVs.

Conclusion:
Detection of the APOE e4 allele as part of the SNV pathway analysis is considered clinically relevant given its well-established role in COVID-19 susceptibility and severity linked to both neurons and astrocytes in the brain. Further studies are warranted to differentiate the influence of host genetics and SARS-CoV-2 variants in relation to inflammation and blood clotting. Clinical monitoring is essential to determine the need for extended genotyping, while optimisation of thrombosis-related pathways is advisable in the evolving milieu of COVID-19 risk stratification.

99

Epidemiology of Adult T-cell Leukaemia/Lymphoma in South Africa over a 10-year period

Dr Erica-Mari Nell[1,2], Dr Ibtisam Abdullah[1,2], Dr Carla Griesel[3], Dr Nadhiya Subramony[4], Dr Louis Almero du Pisani[5], Dr Zivanai Cuthbert Chapanduka[1,2]

[1]Division of Haematological Pathology, Department of Pathology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]National Health Laboratory Services, Tygerberg Hospital, Cape Town, South Africa, [3]Ampath Laboratories, Cape Town, South Africa, [4]Lancet Laboratories, Johannesburg, South Africa, [5]PathCare Laboratories, Cape Town, South Africa

Biography:

Erica-Mari Nell is a haematopathologist in the Department of Haematological Pathology at Stellenbosch University and NHLS Tygerberg Hospital. She completed her MBBCh at the University of the Witwatersrand in 2014 and obtained her FC Path(SA) Haem and MMed at Stellenbosch University cum laude in 2021. Dr Nell completed a MSc at University of Cape Town in 2010. Her background in science in genetics has fostered a keen interest in research. She enjoys mentoring young researchers and teaching registrars.

Introduction: Adult T-cell Leukaemia-Lymphoma (ATLL) is a rare and aggressive malignancy of mature T-cells. Limited epidemiological studies have shown that there is substantial variation in age at diagnosis and subtype distribution between different geographical regions. This is the first epidemiological study of ATLL in South Africa.

Methods: A national epidemiological study of ATLL in South Africa was performed. All new cases of ATLL from 2009 to 2019 were identified by laboratory database search in public and private health care sectors. Demographic and diagnostic data were obtained and the cases were subtyped according to the Shimoyama classification.

Results: There were 31 patients with ATLL over the 10-year period, with an incidence of 0.06 per 100 000 population. The male to female ratio was 1:1 and the median age at diagnosis was 37 years. The acute subtype of ATLL was the most commonly seen subtype in South Africa.

Conclusion: In this, the first epidemiological study of ATLL in South Africa, we demonstrate that ATLL is a rare disease, is most commonly of the acute subtype and that patients present at a considerably younger age than the reported age in other nations.

150

Obesity, Type 2 diabetes and disease progression-related variations in adipocyte histology and gene expression signatures in cardiac, retroperitoneal, and inguinal fat depots from db/db mice

Miss Thembeka Nyawo[1], Prof Sithandiwe Mazibuko-Mbeje[2], Dr Hanel Sadie Van Gijsen[3], DR Phiwayinkosi Dludla[2], Prof Hans Strijdom[3], Prof Carmen Pheiffer[2]

[1]South African Medical Research Council - Biomedical Research Innovation Platform, Parow Valley, South Africa, [2]North-West University, Department of Biochemistry., Mahikeng, South Africa, [3]2Centre for Cardio-Metabolic Research in Africa (CARMA), Division of Medical Physiology, Faculty of Medicine and Health Sciences, Stellenbosch University., Tygerberg, South Africa

Biography:

Thembeka Nyawo is a PhD candidate within the South African Medical Research Council - Biomedical Research Innovation Platform holding a dual major BSc degree in Biochemistry and Microbiology from the University of Zululand, Honors degree in Microbiology (2009-2012), MSc degree in Genetics (2014-2016). Currently pursuing a PhD in collaboration with the Medical Physiology, at the division of Medical Physiology - Centre for Cardio-Metabolic Research in Africa (CARMA). Her area of expertise include exploring molecular techniques in order to understand the role of cardiac fat and its role in the development of cardiovascular disease risk in type 2 diabetes.

BACKGROUND: Obesity, diabetes and aging are associated with adipose tissue remodelling and metabolic dysregulation. Adipose tissue depots contribute differently to the pathogenesis of these metabolic conditions; however, the underlying pathophysiological mechanisms have not yet been fully elucidated.
OBJECTIVES: To evaluate the effect of aging, obesity, and diabetes on adipocyte morphology and gene expression signatures in cardiac (CF), retroperitoneal (RF), and inguinal (IF) fat depots of db/db mice.
METHODS: CF and, RF and IF fat, representing visceral (VAT) and subcutaneous (SAT) fat, respectively, were collected from 8-, 12-, and 18-week-old male db/+ and db/db mice and their non-diabetic counterparts. Histological differences between fat depots were assessed using haematoxylin & eosin staining. Gene expression differences between CF, RF and IF adipose depots were evaluated using quantitative real-time PCR, targeting genes involved in oxidative stress, thermogenesis, inflammation, and substrate metabolism.
RESULTS: Adipocyte area increased with disease state and in all depots over time. The greatest increase was observed for IF, followed by CF and lastly RF. Limited disease state and depot-specific gene expression differences were observed at 8 weeks of age, however with diabetes progression and time, CF showed unique expression of UCP1 and PGC1α compared to RF and IF. The inflammatory marker MCP1 was upregulated in all depots according to disease state and age, with the greatest increase observed in RF and IF
SUMMARY: Adipocyte histology and gene expression differed according to age, obesity, diabetes and adipose tissue depot. The increased expression of UCP1 and PGC1α, and lower disease-related increase in MCP1 expression in CF compared to RF and IF, highlights its unique thermogenic capacity and potential cardioprotective role.

129

Modelling inflammation in zebrafish – insights from fluorescence microscopy

Dr Tracey Ollewagen[1], Prof Carine Smith[1]
[1]*Division of Clinical Pharmacology, Dept of Medicine, Stellenbosch University, Parow, South Africa*

Biography:
Tracey Ollewagen is a postdoctoral fellow in Clinical Pharmacology at Stellenbosch University. She obtained her PhD in 2021 in Human Physiology. Her current research focus is on understanding the development of myocarditis and fibrosis in autoimmune rheumatic diseases with the use of both human sample analysis and novel zebrafish models.

Dysregulation of the inflammatory response in humans can result in a number of chronic inflammatory diseases. Regularly investigated zebrafish inflammatory models include tailfin transection and lipopolysaccharide (LPS) exposure. However, the analysis of inflammation in zebrafish following an insult/intervention is often limited to fluorescence microscopy of transgenic fish with gene reporters and whole-body quantitative polymerase chain reaction (PCR) data. Microscopy has the benefit of providing locality-specific information. However, availability of transgenic zebrafish is limited in African countries due to the high cost and time delays associated with importation to geographically isolated countries. Thus, exploration of other microscopy options is warranted. The current study explored the capacity of transferring immunofluorescence techniques using cytokine antibodies directed against human antigens, for investigation of inflammation in zebrafish larvae relative to controls. Zebrafish larvae were either exposed to 25 µg/ml LPS for 24 hours (starting at 4 days post fertilization (dpf)) or subjected to tailfin transection (and subsequent regeneration for 2 hours) at <5dpf to induce inflammation. All larvae were euthanised at 5dpf. Exposure to LPS resulted in a more generalised inflammatory response throughout the zebrafish whereas tailfin transection resulted in a more targeted inflammatory response in the tail region. Based on localisation and intensity of positive staining relative to controls, data suggest that anti-human cytokine antibodies (TNF-a, IL-1β, IL-6, IL-10, MCP-1, MIF, BMP-7) exhibit sufficient species homology in zebrafish larvae to warrant its use in investigations pertaining to inflammation. In conclusion, data supports immunofluorescence staining as an alternative fluorescence microscopy method with which to study the inflammatory immune response following an insult, and which may prove more cost- and time-effective to isolated countries.

126

Implications of altered gastrointestinal trace amine load in a larval zebrafish IBS model

Miss Lesha Pretorius[1], Dr Kelly Peterson-Ross[2], Prof Carine Smith[2]
[1]Department of Physiological Sciences, Stellenbosch University, , , [2]Division of Clinical Pharmacology, Department of Medicine, Stellenbosch University, ,

Biography:
I am a final-year PhD student with a multidisciplinary research interest in gastrointestinal physiology.

Irritable bowel syndrome (IBS) is a female predominant functional gastrointestinal disorder, underpinned by microbial dysbiosis and microinflammation. Despite the high global prevalence, factors affecting individual symptomology remain obstruse. We hypothesised that changes in trace amine (TA) load may link together diet, gut microbiota, inflammation, and sex in this context. Zebrafish larvae were exposed to TNBS to induce an IBS-like phenotype and treated with a variety of TAs. The ensuing systemic and intestinal effects were monitored utilising live imaging and whole-mount staining methodologies. Changes in behaviour were quantified using DanioVision activity tracking equipment with EthoVision software. In addition, changes in intestinal tight junction protein expression (immunostaining) and whole-body H2O2 and prostaglandin E2 levels (colourimetric assays) were assessed. Behavioural assessments indicated that agmatine partially protected against TNBS-induced reductions in general activity. In the absence of TNBS, β-phenethylamine and ρ-tyramine reduced neutral red staining ($p<0.01$ for both), while agmatine increased staining ($p<0.05$). With the addition of TNBS, β-phenethylamine and tryptamine treatment abolished staining capacity altogether ($p<0.0001$ for both). Tight junction protein status was also modulated by TA exposure, with agmatine increasing both occludin and ZO-1 levels in the absence of an inflammatory stimulus. Interestingly, the effects of β-phenethylamine, tryptamine and ρ-tyramine, but not agmatine, were blunted in the presence of estradiol in this context. In the current study, the potential protective effect of agmatine seems to be mediated through the modulation of hydrogen peroxide and prostaglandin E2 levels under different conditions. In conclusion, high doses of β-phenethylamine, tryptamine and ρ-tyramine seem most detrimental in this context, while agmatine seems to confer potential gastrointestinal protection, which we suggest is related to its subsequent metabolism. Moreover, the addition of estradiol highlighted the complexity of this hormone's role in gastrointestinal function.

245

Establishment and characterization of a novel obese H9c2 cardiomyoblast model

Mr Vuyisane Michael Rabela[1]

[1]Stellenbosch University, Faculty of Medicine and Health Sciences, Department of Biomedical Sciences, Division of Medical Physiology, Cape Town, South Africa, [2]Stellenbosch University Faculty of Medicine and Health Sciences, Division of Medical Physiology, Cardiometabolic Research in Africa (CARMA), Cape Town, South Africa

Biography:

Vuyisane Michael Rabela obtained his BSc and BSc honours in biochemistry at North West University. Currently an MSc student in Medical Physiology at Stellenbosch University, under the mentorship of Prof Barbara Huisamen and Dr Marguirite Blignaut. My current project focuses on the molecular signals linking premature cardio (vascular) aging to obesity, insulin resistance, and mitochondrial dysfunction, with a particular focus on the Ataxia Telangiectasia Mutated kinase, and whether antioxidants such as Buchu and Resveratrol could potentially be used to manipulate this protein.

Purpose: Ataxia telangiectasia mutated (ATM) protein kinase modulates carbon and fatty acid metabolism and maintains redox homeostasis. Our laboratory showed that cardiac ATM is decreased in obese Wistar rats. However, the mechanisms involved in ATM decline in obesity are still largely unknown. The aim of this study was to 1) establish and 2) characterize an obese and insulin-resistant model of rat H9c2 cardiomyoblasts using a combination of fatty acids (oleic and palmitic) using relevant signaling molecules as endpoints of pathology.
Experimental Design: H9c2 cardiomyoblasts were cultured and co-treated for 24 hours with increasing amounts of palmitic acid (100, 200, and 400µM) and oleic acid (100µM) to induce obese conditions but not cell death, whereafter, lipid accumulation (Oil Red O, n=3), cell viability (MTT assay, n=4), oxidative stress (DCFH-DA, n=3) was determined. To determine whether the cells are insulin resistant, 100 nM insulin was administered (n=1) for 15min, whereafter, the samples were prepared for Western blot analysis. Statistical analysis was performed using a one-way ANOVA and Bonferroni's post-hoc analysis test, and the threshold of $p < 0.05$ was considered significant.
Results: Increasing fatty acid concentration revealed a dose-dependent accumulation of fatty acids ($p=0.0011$, $p=0.0001$ and $p<0.0001$ for 100:100, 100:200 and 100:400µM) compared to untreated cells. A 40-60% decrease ($p=0.0160$, and $p=0.0140$) for 100:200 and 100:400µM compared to lower concentration (100:100 µM, $p>0.0689$) in cell viability was observed. In addition, DCFH-DA showed increased (100:200 and 100:400µM) oxidative stress compared to the untreated cells. Insulin stimulation showed attenuated Akt phosphorylation in cells treated with fatty acids compared to untreated cells, suggesting insulin resistant state.
Conclusion: Altogether, the results showed that i) high palmitic acid concentration inhibits cell viability and results in oxidative stress, and ii) palmitic acid inhibits the insulin signaling pathway through mechanisms that are yet to be explored.

221

MICROBIAL METABOLITES OF FAT, NOT FIBER, MAY EXPLAIN THE INCREASING INCIDENCE OF COLON CANCER WITH URBANIZATION OF SOUTH AFRICANS

Dr Matsepo Ramaboli[1], Mr Loye Eberhart II[2], Dr Annette Wilson[2], Dr Leolin Katsidzira[3], Dr Suereta Fortuin[1], Professor Dirk Haller[4], Professor Stephen O'Keefe[1]

[1]Stellenbosch University, Tygerberg, South Africa, [2]University of Pittsburgh, Pittsburgh, USA, [3]University of Zimbabwe, Harare, Zimbabwe, [4]Technical University of Munich, Munich, Germany

Biography:

Dr Matsepo Ramaboli holds a PhD in life sciences through the prestigious Fulbright scholarship from the University of South Carolina, USA. She has been the first registered postdoctoral fellow in the newly created African Microbiome Institute (AMI) at Stellenbosch University, where she has immersed herself in the ground breaking rural and urban studies that seek to assess geographic patterns in diet, the microbiome and risk of non-communicable diseases, working and collaborating with various world-renowned scientists constituting the AMI Research Consortium. She has presented the results of the ongoing pilot study in national and international meetings.

Colon cancer is one of the non-communicable diseases (NCDs) common in the USA and Europe, rare in Africa. Until recently, indigenous southern Africans had the lowest risk for colon cancer (<5:100,000 compared to ~60:100,000). However, there is grave concern that with the massive population shift from rural to urban environments and westernization of their diets, NCDs are becoming more common in Africa. We have previously shown that westernization is associated with an increase in dietary fat and a reduction in plant fiber consumption. Here we investigate whether the increase in colon cancer is associated with an increase in colonic microbial metabolites related to fat consumption and associated with carcinogenesis, and a reduction in metabolites related to fiber fermentation (namely, short-chain fatty acids [SCFA]), associated with suppression of neoplasia.

Methods: Healthy middle aged volunteers were recruited from urban and rural Xhosas living in Khayelitsha and the Eastern Cape, respectively, as well as the rural Zimbabwean Mashonas. A fecal sample was collected from each participant for analysis. Quantitation of targeted fecal SCFA, bile acids and microbial genes was performed. Dietary information was collected using Food Frequency questionnaire and linked to local food composition tables. Unpaired Student's t-test of significance was performed.

Results: Comparison of the various regions showed a trend of increasing bile acid levels, baiCD gene copies, and dietary fat amounts with changing region from more rural to more urban, although total energy consumption is slightly lower for Eastern Cape relative to Zimbabwe. SCFA did not show such any correlation.

Conclusions: These results provide evidence that the recent increase on colon cancer with urbanization in South Africa is associated with an increase in dietary fat consumption and the microbial production of secondary bile acids, which have well recognized tumorigenic properties. Surprisingly, the "protective" fiber fermentation metabolites were not lower with urbanization.

236

Sequential drug challenge outcomes amongst HIV-TB co-infected patients

Dr Rhodine Smith[1]
[1]*stellenbosch university, cape town, South Africa*

Biography:
Dermatology registrar at Tygerberg hospital

Background
In South Africa, TB incidence is four times higher than the global average, with more than half of the cases also co-infected with HIV. Up to a third of HIV-TB co-infected patients experience serious adverse drug reactions.
In the context of advanced immunosuppression, severe cutaneous drug reactions such as drug rash with eosinophilia and systemic symptoms (DRESS) and Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN) are associated with a high disease-related mortality. Sequential drug challenge is known as the gold standard for the re-introduction of first-line TB drugs.
Objective
To describe clinical outcomes of challenge reactions during sequential drug challenge in HIV-TB co-infected patients with first-line TB drug-associated severe cutaneous drug reactions (SCAR).
Methods
This study was a retrospective record review dating from 1 January 2019 to 31 December 2020 at Groote Schuur Hospital (Cape Town, South Africa).
Results
Of the included patients, 13/17 and 4/17 had DRESS and SJS/TEN respectively. The median age was 34 years (Interquartile range (IQR) 29-42), their median CD4 cell count was 117 cells/uL (IQR 63-169).
With sequential drug challenge, thirteen patients had a challenge reaction to one of the first-line TB drugs (single reaction group), and four patients reacted to more than one first-line TB drug (multiple reaction group). In the multiple reaction group 3 out the of 4 patients were on concomitant ART at the time of their SCAR diagnoses, the median CD4 cell count in this group was 116 cells/uL (IQR34-254). (Compared to 117 cells/uL (IQR 66-137) in the single reaction group)
Conclusions
As previously reported, none of the challenge reactions met the common terminology criteria for adverse events grading as life-threatening events. Challenge reactions were heterogenous with inter-individual variability.

121

Investigating Mitochondrial Dysfunction In vitro in the presence of oxidative stress and the absence of Ataxia Telangiecstasia Mutated protein kinase (ATM)

Mr Stephen Southway[1]

[1]*Centre for Cardio-Metabolic Research in Africa, Division of Medical Physiology, Stellen, Tygerberg, South Africa*

Biography:

My name is Stephen Southway, I graduated fro Stellenbosch university with a Bachelors degree in Human Life Science (Physiology and Genetics). I am currently studying towards an Honours in Medical Physiology with hopes to carry with my Masters next year.

Oxidative stress, due to mitochondrial dysfunction has been associated with aging and cell death. Ataxia telangiectasia mutated protein kinase (ATM) acts as a sensor for reactive oxygen species (ROS) levels in the cell and is activated by internal and external ROS levels. It has previously been shown that inhibition of ATM leads to decreased ATP production and increased oxidative stress. Another study showed that oxidative stress alone was enough to induce senescence (premature aging) in cardiomyoblast cell culture. However, the latter study did not investigate the role of ATM in the process. Therefore, this study aims to investigate whether the loss of functional ATM through chemical inhibition will exacerbate senescence in the presence of external oxidative stress.

The study will grow H9c2 cardiomyoblast cells in culture and treat them with 20, 30 and 50 µM H_2O_2 with and without the addition of KU60019 (an ATM inhibitor). Cells will be pretreated with 3 µM KU60019 for 1 hour (or DMSO as the vehicle control) prior to addition of H_2O_2 for a further three hours. Currently, experiments are underway to determine whether oxidative stress levels, which will be measured with dichloro-dihydro-fluorescein (DCFH), are increased in the presence of KU60019. Cell viability will be determined with an MTT assay. Preliminary results indicate that these concentrations of H_2O_2 do not result in cell death compared to untreated cells. These results will be used to determine which concentration of H_2O_2 can be used to induce senescence over a 48-hour period.

Based on literature, it is expected that the inhibition of ATM activity with KU60019 will result in increased oxidative stress, that can lead to senescence in this cell type. The study hopes to establish a senescent cardiomyoblast model that can be used to further investigate the role of ATM in this context.

178

Benefit-sharing opportunities for stakeholders participating a genetics pilot conducted in high-risk patients from a South African health funding pool

Dr Nicole Van Der Merwe[1], Professor Manie De Klerk[2], Ms Kelebogile Moremi[1,3], Professor Maritha J. Kotze[1,3]
[1]Division of Chemical Pathology, Dept of Pathology, Stellenbosch University, Tygerberg, South Africa, [2]Stellenbosch University Business School, Bellville, South Africa, [3]National Health Laboratory Service, Tygerberg, South Africa

Biography:
Dr Nicole van der Merwe is a private practicing Genetic counsellor who graduated with an MSc (Med) in Genetic Counselling at the University of Cape Town in 2018 after obtaining a PhD in Molecular Pathology from Stellenbosch University (SU) in 2016. She is the founder of FamGen Counselling, a Genetic counselling collaboration platform which strives to create continent-wide access to counselling, genetics education and training. She is experienced in research coordination (Cape Peninsula University of Technology), research project management (SU), and participates in various NIH-funded H3Africa projects and activities.

Introduction: The benefit of obtaining medical scheme reimbursement for genetic testing and genetic counselling is realized by optimised uptake, improved patient management and reduction in healthcare costs. To close the current implementation gaps between research and clinical practice, the Open Genome Project (OGP) was initiated to facilitate pathology-supported genetic testing (PSGT) applied in two pilot programmes performed to date.

Aim: To identify the benefit-sharing opportunities of a medical scheme genetics pilot programme undertaken by OGP stakeholders aimed at overcoming the cost barriers associated with the implementation of personalized genomic medicine in clinical practice.

Methods: Patients diagnosed with cancer or other non-communicable diseases (NCDs) were evaluated by the Adjusted Clinical Groupers and Resource Utilisation Band risk rating structure (John's Hopkins) to identify high-costing or high-risk scheme beneficiaries in claims databases. Claims data were extracted for beneficiaries in high risk groups and discussed with participating clinicians who acknowledged the potential benefit-sharing opportunity in patient care, as part of the OGP pilot programme.

Results: Of 154 patients' general practitioners invited to participate in the pilot programme, a total of 21 tests were referred for PSGT of key NCD pathways, ideally suited to assess eligibility for whole exome sequencing in uninformative cases. Genetic counselling was employed to obtain informed consent for case reports in three patients with breast cancer to evaluate familial risk, co-morbidities/lifestyle risk and therapy-induced risk.

Conclusions: The importance of genetic counselling at the intersection between participating laboratories and the clinic was most evident for improved access to genetic testing accompanied by optimal management of patient expectations and result delivery. Various communication challenges encountered from sample collection to report generation were addressed with the use of a mobile phone application. The OGP provided an ideal interdisciplinary platform within a constantly evolving workflow as new data sources become available for risk stratification.

81

An investigation into the temporal effects HIV Viral load and CD4 cell count on retinal network features in an HIV+ART Western Cape study population.

Dr Ingrid Webster[1], Ms Boipelo Kgokane[2], Dr Frans Everson[3], Dr Amanda Genis[4], Mr Jody Abrahams[6], Ms Yushra Dinnie[5], Prof Hans Strijdom[7]

[1]CARMA, Division of Medical Physiology, FMHS, University Of Stellenbosch, Cape Town, South Africa, [2]CARMA, Division of Medical Physiology, FMHS, University Of Stellenbosch, Cape Town, South Africa, [3]CARMA, Division of Medical Physiology, FMHS, University Of Stellenbosch, Cape Town, South Africa, [4]CARMA, Division of Medical Physiology, FMHS, University Of Stellenbosch, Cape Town, South Africa, [5]CARMA, Division of Medical Physiology, FMHS, University Of Stellenbosch, Cape Town, South Africa, [6]CARMA, Division of Medical Physiology, FMHS, University Of Stellenbosch, Cape Town, South Africa, [7]CARMA, Division of Medical Physiology, FMHS, University Of Stellenbosch, Cape Town, South Africa

Biography:

Ingrid joined the Division of Medical Physiology in 2001 as a technical research assistant, after completion of her honours degree in Physiology at the University of Stellenbosch, Since then she has completed an MSc, PHD, 3 years of Post doc and a 5 year RCA award on the effect of rooibos and melatonin supplementation during antiretroviral therapy. From 2020 she has been Principal Research Officer in the Division and currently works on the EndoAfrica project.

BACKGROUND

Retinal vessel network features have been associated with various cardiovascular risk factors, including HIV/AIDS and antiretroviral therapy (ART). The temporal relationships between retinal vessel network features and HIV/AIDS+ART have not been described in the South African context. The current study aimed to investigate whether markers of HIV/ART are associated with retinal vessel network features in an HIV+ART Western Cape study population.

METHODS

The study followed a longitudinal repeated measures design (baseline vs.18-month follow-up) with volunteering participants (n=82) recruited from the Worcester area. Demographic, lifestyle, socioeconomic and anthropometric data were recorded. Fasting blood and urine samples were sent to the NHLS for biochemical analyses. Retinal images were taken with a Canon CR-2 camera and analysed with MONA REVA 2.1.1 software. Linear mixed model analyses were applied (statistical significance: $p<0.05$).

RESULTS

The study population's mean±SD age at baseline was 41.1±9.0 years. The median (range) and mean±SD viral load and CD4 cell count were 50 (10 to 675032) copies mRNA/mL and 511.3±228.9 cells/mm3. After adjusting for confounding factors, each 250 cells/mm3 increment increase in CD4 cell count was associated with a 3.50 (95%CI: 1.00 to 6.00) increment increase in number of branchpoints (p=0.006) and a 3.00 (0.750 to 5.250) increment increase in number of endpoints (p=0.010). Each 1000 copies mRNA/mL increment increase in viral load was associated (-0.0006 (95%CI: -0.00122 to -0.00003) with Fourier fractal (p=0.043) and average tortuosity of branch segments (-0.00006 (-0.000128 to 0.000003) increment decrease in (p=0.022).

CONCLUSION

Results from the current study show that HIV (Viral load) is associated with a less complex retinal vessel network (tortuosity) and immune function (CD4 cell count) was associated with a denser retinal vessel network (branch- and endpoint). These results suggest that retinal vessel network features may serve as markers of HIV disease progression and regression, but more investigation is needed.

Theme 3 – Global Health, Public Health and Health Systems / Tema 3 – Globale Gesondheid, Openbare Gesondheid en Gesondheidstelsels

234

Prevalence and factors associated with substance use among university students inSouth Africa: Implications for prevention

Ms Stacey Blows[1], Dr Serena Isaacs[2]
[1]*Stellenbosch University, , South Africa,* [2]*The University of the Western Cape, Cape Town, South Africa*

Biography:
Ms Stacey Blows is a psychology graduate who is focused on promoting and maintaining the overall health and well-being of marginalised and underserved communities through the prevention and treatment of disease across the entire lifespan. She intends to contribute to the improvement of systems that promote and maintain individuals' health and well-being.

Moreover, Ms Blows seeks to develop innovative frameworks to highlight the importance of eliciting community views when developing targeted interventions, and the absolute need to adopt a bottom-up approach to disease prevention in communities.

Background: Substance use is an important public health concern in many countries across the globe. Among the general public, institutions of higher learning have
developed a reputation for inducing new substance use among students. In addition to socio-demographic factors, substance use and abuse among university students often appear to be related to psychological stressors typically related to the demand to adapt to the new environment and the pressures associated with academia. The purpose of this study was to identify the prevalence of and factors associated with substance use among university students.
Methods: This quantitative study employed convenience sampling to recruit university students who were 18 years and older. The
study made use of self-administered online questionnaires, which participants completed via SurveyMonkey. The sample consisted of 2915 students. Descriptive statistics was used to describe and provide the prevalence and overview of the demographic characteristics of the respondents. Associations between variables were explored using Chi-square and Mann-Whitney U tests.
Results: The main findings revealed a substance use prevalence rate on 62.7%. The most prominent substances used by students was alcohol (80.6%), cannabis (46%), and ecstasy (5.3%). Furthermore, this study revealed clear associations between students' substance use and mental health. Students who reported substance use at university reported higher depression and anxiety scores than those who did not. However, findings reveal no significant association (p = .233) between being a substance user and nonsubstance user and students respective self-perceived stress scores.
Conclusion: Results show the majority of sampled students had started using substances (both alcohol and other substances) only after entering university. The novel findings of this study could serve as a baseline input to inform

policy makers, programme developers, service providers, parents, and other stakeholders who are involved in the design and implementation of more effective

258

Adherence to COVID-19 public health interventions: community perspectives

Professor Rene' English[1], Ms Michele Pappin[1], **Ms Stacey Blows[1]**
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Ms Stacey Blows is a researcher working in the Division of Health Systems and Public Health in the Department of Global Health. She has a Masters in Psychology and an interest in community psychology, health promotion and community engagement and participation.

Introduction
The COVID-19 (Coronavirus Disease 2019) pandemic has resulted in economic and social distress prompting public health and resulting in both public health and humanitarian crises in South Africa and beyond. Population-based public health interventions were considered first line prevention strategies, particularly in settings where vaccine rollout and uptake is low. This paper presents the results of an exploration of the perspectives and experiences of community volunteers in two disadvantaged populations in the Western Cape, South Africa regarding their adherence to government COVID-19 regulations.
Methods
Using a participatory, co-creation process, qualitative assessments was carried out from October 2020 to January 2021 using various social media platforms, phone interviews and online and face-to-face focus group discussions (FGDs) with community members in two primarily low-income communities. Knowledge gaps, cultural beliefs, or behavioural patterns were explored.
Results
The results revealed knowledge gaps regarding the disease and vaccines in general. Levels of dis- and mistrust were high and information, particularly in government sources. Poverty and poor community support from policy-makers and other relevant stakeholders negatively impacted their motivation for adherence. Knowledge to promote uptake of vaccines appeared to be limited. Other deep-rooted inequality also served as important barriers with numerous socio-economic factors discussed as taking prominence over the need to adhere to public health measures. They expressed a need for more engagement and support from policy makers.
Conclusion
Overall, the findings highlight the value of eliciting community views to inform the development of targeted public health interventions, and the need to engage in bottom-up approaches to disease prevention and control in the communities.

256

A 2015-2020 review of demographic and health trends in South Africa: a focus on equity

Professor Rene' English[1], Dr Annibale Cois[1], Ms Candy Day[2], Ms Thulile Zondi[3], Mr Gaurang Tanna[4]
[1]Stellenbosch University, Cape Town, South Africa, [2]Health Systems Trust, Durban, South Africa, [3]South African National Department of Health, Pretoria, South Africa, [4]Bill and Melinda Gates Foundation, Pretoria, South Africa

Biography:
Professor René English is a Medical Doctor and Public Health Medicine Specialist who holds a doctoral degree. She was head of the Health Systems Research Unit at the Health Systems Trust; co-editor for the South African Health Review and District Health Barometer; and past fellow of the Africa Science Leadership Programme. She is the Head of the Division of Health Systems and Public Health (Faculty of Medicine and Health Sciences) at Stellenbosch University. She served on the South African Health Ministerial Task Team for Human Resources for Health and the South African Lancet National Commission on High Quality Health Systems.

Introduction
South Africa (SA) is one of the most inequal countries in the world and inequality is rooted in its history and structural arrangements. Tracking key health and demographic trends over time enables assessment of progress towards reducing unfair health differences. Assessing health inequity requires the application of moral judgements when analysing health differences. This research highlight progress made in terms of the demographic and health status in SA with a focus on inequity and how SA can improve the monitoring of these key measures.

Overview of approach
Secondary data analysis of existing official demographic and health data was conducted. Specific consideration was given to factors identified as key drivers of health inequity. Consideration was also given to the various methods for measuring health inequity and existing deficiencies within the SA health system that serve as challenges for optimal assessment of health inequity.

Results
The results reveal that overall there have been a number of gains in key demographic and health indicators between 2015 and late 2019 but that the COVID-19 pandemic resulted in a decline in life expectancy. The SA population has increased and evidence of ongoing internal migration from rural to urban settings was observed. Overall, fertility rates have declined. Tuberculosis and non-communicable diseases remain predominant causes of death and communicable diseases drive infant and child mortality. Overall, in terms of equity those living in rural provinces, females and black Africans remain disadvantaged in terms of mortality and morbidity and access to health services. Accurate measurement of equity remains a challenge.

Conclusions and recommendations
SA has made great strides in terms of overall demographic indicators and the health status of the population. Some challenges remain and relate to the ability to robustly measure health inequity. COVID-19 has impacted on aspects of the health status of the SA population.

141

TESTIS CANCER DEMOGRAPHICS, STAGING, TREATMENT AND OUTCOMES IN SOUTH AFRICA. ARE WE DROPPING THE BALL?

Gerard Grobler[1], Dr Pieter Spies[1], Dr Henriette Burger[1], Dr Heidi Van Deventer[1]
[1]*Stellenbosch University, Parow, Bellville, South Africa*

Biography:
Senior registrar in the department of Urology at Tygerberg hospital

INTRODUCTION & OBJECTIVES: There are a few studies describing the epidemiology of testis cancer in Africa, but there are limited data describing the outcomes in South Africa, or Africa, compared to the rest of the world. Our study sought to determine the demographics, staging, treatment and outcomes among males diagnosed with, and treated for, testicular germ cell tumours (TGCT) in South Africa at Tygerberg hospital during 2005 – 2020 - and to compare these results to the current available data worldwide.

DESIGN & METHOD:
Data were retrospectively reviewed for males >12 years with TGCT's, diagnosed and treated at Tygerberg hospital from 1 January 2005 to 31 December 2020. Racial status was self-declared and included Caucasian, Mixed ethnicity, African and Asian. Patients were identified from Urology-Oncology records, as well as from pathology records indicating any form of testicular cancer at the National Health Laboratory Service. Data were extracted for demographics, staging, treatment and outcomes. Patients were either contacted directly or as part of the MRC living status report by the Department of Home Affairs to determine the last contacted date for survival outcomes.

RESULTS:
The most common risk factor was cryptorchidism (14.1%). Seminomas presented a decade older than non seminomatous germ cell tumours (NSGCTs). The histopathological classification was fairly equal, with 70 seminoma and 72 NSGCTs. The overall 5-year survival was 91% for Seminoma compared to 78% in NSGCTs. With a time horizon of 15 years a participant is expected to survive 13.6 years in the seminoma group and 11.7 years in the NSGCTs group. This represents a 16% increase in survival time for the seminoma group.
SUMMARY & CONCLUSION:
This study describes our demographics and compares our treatment and outcomes internationally . As a developing country, we have a firm grip on the ball, with some room for improvement.

118

Capturing public health through the camera and film

Miss Lynn HENDRICKS[1,2]
[1]Stellenbosch University, Cape Town, South Africa, [2]Department of Social Sciences, KU Leuven, Leuven, Belgium

Biography:
Lynn Hendricks is a practicing Research Psychologist and Lecturer who works in the Division of Health Systems and Public Health in the Department of Global Health, Faculty of Medicine and Health Sciences at Stellenbosch University. She is an executive member of the Psychological Society of South Africa. She is currently a Global Minds PhD scholar and is completing a joint PhD in Social Science at KU Leuven and Public Health at Stellenbosch University. She is a business owner of Research Ambition, a research consultancy and the co-founder of Hearts in Action, a NPO focusing on gender based violence and youth.

Public health documentaries have been around since the beginning of the film industry, with the first silent anthropological film released in 1922. The genre of documentary film appeals to those who want to learn and discover though a medium which offers sound, images, and sensorial visual experience over reading text. Whereas feature films are meant to entertain, documentary films are meant to educate. Documentary filmmaking requires research to provide the context, footage and other visuals, narration, and interviews that will appear in the film. We filmed and co-produced a documentary with young women living with perinatal infections of HIV in Bishop Lavis, Bonteheuwel, Clarkes Estate, and Wallacedene. This poster shares our learnings regarding the methodological and ethical considerations when conducting public health research, in the South African context, using the method documentary film. These include 1. Protection of identity of participants, 2. Providing nonbiased Information – balancing truth and aestheticism, 3. Ensuring the safety of the researchers and participants, 4. The interview style to be used during the recording, 5. Degree of participation in planning, recording and analysing data for participants, 6. Fair dissemination practices postproduction, and 7. Sufficient finances, time, and expertise to complete the project. We found that using documentary film making and Photovoice to be creative and relatable avenues within the participatory health research sphere. Participants were able to fully participate in the recording of their stories but could also visually engage with it both during and postproduction. Integrating documentary film into health research is recommended to enhance our abilities to produce strong, rich, and dynamic research outputs, as well as explore and communicate diverse knowledges, experiences, and stories.

119

Supporting COVID-19 community volunteers through creative expression

Miss Lynn HENDRICKS[1,2], Miss Stacey Blows[1], Prof Rene English[1]
[1]*Stellenbosch University, Cape Town, South Africa,* [2]*Department of Social Sciences, KU Leuven, LEUVEN, Belgium*

Biography:
Lynn Hendricks is a practicing Research Psychologist and Lecturer who works in the Division of Health Systems and Public Health in the Department of Global Health, Stellenbosch University. She is an executive member of the Psychological Society of South Africa and is currently a joint Global Minds PhD scholar in Social Science at KU Leuven and Public Health at Stellenbosch University. She is a business owner of Research Ambition, a research consultancy, a co-founder of Hearts in Action, a NPO focusing on gender based violence and youth, and the co founder of the Brackenfell-Kraaifontein Community Action Network.

Volunteers work in difficult, complex, and sometimes dangerous environments. Direct exposure to traumatic events, organisational issues and working conditions have a significant impact on the stress levels and well-being of volunteers. This includes unclear job descriptions, poor preparation and briefing and inconsistent or inadequate supervision. Most volunteer just picked up their tools and started working to provide immediate relief there were no programmes in place to support them as individual active citizens. It is important to consider the mental health and psychosocial needs of 'spontaneous volunteers' who often join humanitarian responses. Since the start of the COVID-19 pandemic, communities responded in multiple ways, one of which were the community action networks (CANs). Seeing the need for mental health support of CAN volunteers, the Social Impact Committee of Stellenbosch University funded a project to conduct arts based psychosocial debriefing supportive workshops. We reached over 200 volunteers across Cape Town and conducted group arts-based workshops facilitated by registered counsellors within participants communities throughout the year 2021. We explored four main areas with them: 1. Their experiences of volunteering during the pandemic, 2. stressors of volunteering, 3. coping strategies and self-care, and 4. the lessons learnt. We followed up the workshops with zoom calls and provided data to community volunteers to join the online discussions. We shared the results of the study and further explored their lessons learnt. Volunteers realized that their individual experiences were not isolated and that others shared similar challenges too. Volunteers walked away from this project realising their resilience and strength with renewed motivation to continue with their work in their communities. Debriefing is an essential tool for spontaneous volunteers who may respond to an immediate emergency need in their communities unaware of the potential psychosocial consequences for themselves or their families.

243

Factors influencing engagement in an HIV prevention intervention for men living in a peri-urban community in South Africa

Dr Christina Laurenzi[1], Dr Xanthe Hunt[1], **Ms Sihle Mamutse[1]**, Ms Nuhaa Holland[1], Professor Mark Tomlinson[1], Professor Jason Bantjies[1,2]
[1]Stellenbosch University, Cape Town, South Africa, [2]South African Medical Research Council, Cape Town, South Africa

Biography:
Sihle Mamutse and Nuhaa Holland are Intern Research Psychologists at the Institute for Life Health Course Research, located in the Department of Global Health, Faculty of Medicine and Health Sciences at Stellenbosch University.

Background
Young men in South Africa face ongoing risks related to HIV, substance abuse, and violence perpetration. The Eyethu intervention engaged young men from a peri-urban township aged 18-29 through testing soccer leagues and vocational training to implement preventive interventions, utilising rapid HIV and alcohol/drug testing, destigmatising gender-based violence, and promoting other prosocial behaviors.

Methods
We present qualitative findings from post-intervention interviews (n=30) which identify how Eyethu supported participants' self-capacity for change.

Results
Participants reported long-lasting problem-solving skills linked to their shared experiences in Eyethu, and they benefitted from opportunities to bond with peers both within and outside of the intervention space. This was influenced by a sense of physical and social unity amongst fellow participants from the same context.

Conclusion
There is an unmet need for tailored interventions that are not only gender-specific, but also context-specific, and promote prosocial roles and behaviours. The findings highlight the association between positive behaviour change and community perspectives of young men's behaviour suggesting that interventions which seek to promote prosocial roles and behaviours should include the community's views/perspectives.

Keywords: South Africa, psychosocial, problem-solving skills, HIV prevention

92

Digital media content required for health education by registered nurses working in primary health care setting in the Northern Tygerberg Sub-Structure, Cape Metropole region, Western Cape

Mr Daniel Jordaan[1], **Ms Keri Lambooy[1]**, Ms Alexa De Villiers[1], Ms Rosie Elliot[1]
[1]Ronel Beukes, Town, South Africa, [2]Lynette Daniels, Town, South Africa, [3]Rosie Elliot, Town, South Africa, [4]Alexa De Villiers, Town, South Africa, [5]Keri Lambooy, Town, South Africa

Biography:
Daniel Jordaan-BSc Dietetics student IV
Rosie Elliot-BSc Dietetics student IV
Keri Lambooy-BSc Dietetics student IV
Alexa De Villiers-BSc Dietetics student IV

Health education is integral in combating the burden of disease. However, the dissemination of health education is challenged by the vast resource constraints, both human and material, that exist within South Africa. Therefore, the objective of the study was to determine the digital media practices and preferences relating to health education, to identify the resource considerations to deliver health education, as well as the learning barriers of the community members, through registred nurses' perspective
A cross-sectional descriptive study design was followed in the Northern Tygerberg Sub-Structure of the Cape Metropole, Western Cape, South Africa. The data was collected by means of fieldworker administered questionnaires, to 93 registered nurses, at ten primary health care facilities within a 10km radius of Tygerberg medical campus.
The most beneficial method of health education according to participants, was in person explanation by healthcare professionals (35.5%; n=33), use of posters and pamphlets (32.3%; n=30), and video content (23.7%;n=22). A Majority of participants (76.3%,n=71) are in favour of subtitles. A majority (77.4%) participants agreed upon the necessity of different language subtitles. A total of 53.8%(n=50) of participants agreed subtitles of the same language were necessary for information retention. The most valuable type of educational content is preventative (69%; n=64), summary information (28%; n=26) & curative health education (3.2%; n=3). A TV in the waiting area was reported by 64,5%(n=60). The predominant learning barriers to health education were identified. Five-minute videos were identified as the most effective duration.
Use of digital media tailored to the health education needs of Registered Nurses has the potential to overcome barriers that hinder the provision of effective health education in primary health care facilities. Future research could compare the use of the same language versus different language subtitles in communities, where multiple languages are spoken among patients for health education.

39

Factors contributing to delays to accessing care for appendicitis in low- and middle-income countries: A scoping review

Miss Johnelize Louw[1,2], Dr Michael McCaul[3], Prof. Peter Nyasulu[3,5], Prof Rene English[2], Miss Jessica Davies[4], Mr Cameron Fourie[4], Miss Jawairiah Jassat[4], Prof Kathryn Chu[1,6]

[1]Centre for Global Surgery, Stellenbosch University, Cape Town, South Africa, [2]Health Systems and Public Health, Stellenbosch University, Cape Town, South Africa, [3]Division of Epidemiology and Biostatics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [4]Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [5]Division of Epidemiology and Biostatics, School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa, [6]Department of Surgery, University of Botswana, Plot 4775 Notwane Rd, Gaborone, Botswana

Biography:

Ms. Louw is a virology and cancer science professional. She received her undergraduate degree in Chemical Biology, followed by an honour's degree in Medical Virology. She then completed her Master of Philosophy in Cancer Science, at the African Cancer Institute. All of her degrees were completed at the University of Stellenbosch. She is currently pursuing her doctorate in Health Systems and Public Health.

Background: Acute appendicitis is one of the most common emergency surgical diseases worldwide for which the standard treatment is appendectomy. Delays in accessing timely appendectomy can lead to complications. Identification and synthesis of evidence on delays and the associated reasons in low- and middle-income countries (LMICs) are lacking.

Aim: To describe the available evidence on delays and the reasons for these delays to accessing appendectomy in LMICs.

Methods: This scoping review used the Arksey & O'Malley framework and the Preferred Reporting Items for Systematic Reviews and Meta-analysis Extension for Scoping Review. In addition, we used the Three Delays framework which divides delays into seeking, reaching, and receiving care to interpret and synthesise our findings. We reviewed Africa Wide EBSCO host, PubMed – Medline, SCOPUS, Web of Science, African Journal Online (AJOL), and Bioline, and the search period was 1 January 1990 to 2022 for relevant studies.

Results: Our search identified 21 893 studies, of which 88 were included. Most of the studies were quantitative in nature. We found that the longer the delay in presentation to a health facility, and the longer the time to receiving care, the greater the chances of complications which lead to a longer length of stay. There is a need for strengthening health literacy at the community level, and It is important for health stakeholders to develop community-based interventions to improve appendicitis knowledge and awareness and health-seeking behaviour. Collaborative efforts towards improving access to care and transport availability, as well as at the health system level itself.

Conclusion: There is a need for targeted interventions at the community level, the availability of transport to ensure accessibility of health care facilities, and interventions at the health system level.

262

Investigation of the mode of delivery and type of digital media that females of childbearing age (18-49 years) in Bishop Lavis, Western Cape, South Africa prefer to engage with.

Miss Annabel Mccaig[1], Miss Nadia Visser[1], miss Jenna Lovegrove[1], Prof Du Plessis[1], Ms Dhlamini[1]
[1]Stellenbosch University, Cape town, South Africa

Biography:
Bsc dietetics students. 4th year. Stellenbosch university.

Infant and young child nutrition (IYCN) and health is of concern in South Africa. Breastfeeding initiation is good, however continuation is poor and complementary feeding practices are suboptimal. Lack of knowledge and inconsistent messages on IYCN hinder improved child health outcomes. It is therefore important to improve IYCN education targeted at women.
The aim of this study was to investigate the modes of delivery and digital media that women of childbearing age prefer to engage with.
A cross-sectional descriptive study with an analytical component was conducted at Bishop Lavis primary health care (PHC) clinic in the Western Cape Province, South Africa.
An educational video on IYCN, including pictures, words, sound, animation and real people was loaded onto tablets and presented to women (n=368) attending Bishop Lavis PHC clinic. A researcher-administered questionnaire was used to assess participants' preference regarding the different modes of delivery used in the digital media presentation.
Results indicate that participants preferred real people (57%; n=210) portrayed in the video, followed by pictures (48%; n=178), sound/voice (37%; n=137), words (30%; n=111) and animation/cartoon (15%; n=55). Most participants (81%; n=297) reported daily usage of digital media, mostly via mobile phones (91%; n=334). Our findings are consistent with the limited evidence nationally and internationally that real people are preferred in digital media. Evidence suggests that this type of educational content can lead to better engagement and behavior change. These findings should inform the improvement of health education provided to women attending PHC facilities within this digital age.

52

Caregivers and early childhood development centre staff members perception of meals provided to children attending early childhood development centres in the City of Tshwane Region 1 of the Gauteng Province, South Africa

Ms Shonisani Edgar Nephalama[1], Mrs Yolande Smit[2]
[1]*Stellenbosch University, Cape Town, South Africa,* [2]*Stellenbosch University, Cape Town, South Africa*

Biography:
Nephalama Shonisani is a registered Dietitian. Currently, she is pursuing Master of Public Health Nutrition degree at Stellenbosch University. She holds Bachelor of Dietetics degree from University of Pretoria.

Introduction: Adequate nutrition during early childhood is of utmost importance as it is the period where the foundations for a child's survival, growth, and development. South Africa is facing a triple burden of malnutrition. One entry point to target malnutrition is Early Childhood Development (ECD) centres. Parents and teachers need to work together to promote healthy eating habits. The aim of the study was to describe caregivers' and ECD centre staff members perception of meals provided at ECD centres and their child feeding practices.
Methods: An observational, cross-sectional descriptive study with an analytical component was conducted. A self-administered questionnaire was completed by caregivers (N=214) and ECD centre staff (N=45) at sampled ECD centres.
Results: The majority of caregivers and ECD centre staff perceived that ECD centres were providing healthy meals (n=209;98.6%, n=45;100%), limiting unhealthy foods (n=150;70.8%, n=28;62.3%), and playing an important role in teaching children healthy eating habits (n=210;98.6%, n=45;100%). Sixty-six percent of caregivers agreed that it is their responsibility to provide healthy meals to children compared to 53.4% of ECD centre staff that disagreed. The majority of caregivers have not seen (n=125, 58.96%) the food provided at ECD centres. The majority of caregivers reported that sometimes they use child control, emotion regulation and food as a reward compared to ECD centre staff that never or rarely use them.
Conclusion: Caregivers and ECD centre staff were not aware of the importance of the dual responsibility of providing healthy food and helping children to develop healthy habits. At both ECD centres and home, consistent feeding practices and the provision of a variety of foods to children can be utilized to support healthy eating and curb the malnutrition pandemic.

264

The influence of low- dose CT attenuation correction on artefacts of myocardial SPECT images for Nuclear Medicine studies

Mrs Lelanie Lucia Nolan[1], Dr Nisaar Korowlay[1,3], Ms Carolynn Lackay[2], Ms Neo Seane[2], Ms Monique Du Toit[1,3], Dr Marguerite Morkel[4]

[1]Tygerberg Hospital, Tygerberg, South Africa, [2]Cape Peninsula University of Technology, Bellville, South Africa, [3]Stellenbosch University, Parow Valley, South Africa, [4]Dr HR Morkel Inc., Panorama, South Africa

Biography:

Lelanie Nolan, is a Nuclear Medicine radiographer with more than 35 years experience as a Radiographer. She had previously occupied managerial roles as an Assistant Director Nuclear Medicine and currently work as the Chief Medical technologist supporting Medical Physicist in Nuclear Medicine. Her role among others is to investigate new imaging protocols and techniques. She obtained her MSc Nuclear Medicine from the Cape Peninsula University of Technology.

Introduction: Breast and diaphragm attenuation may cause anterior and/or inferior soft tissue artefacts during Tc-99m sestamibi imaging and may interfere with the visualisation of the perfusion defects of the myocardium.

Aim: The aim of the study was to determine whether hybrid SPECT/CT, will improve the image quality by reducing the soft tissue artefacts with the application of attenuation correction maps in myocardial SPECT perfusion studies.

Materials and Methods: The results of the 100 patients between January 2015 and December 2016 for myocardial perfusion scintigraphy were quantitatively reviewed. The images were given a score of 0-4. The non-attenuated corrected (NAC) and the attenuation corrected (AC) stress and rest images are the dependent variables of the study. The independent variables are the relevant factors such as gender, age, weight, height and position of the patients during imaging. The critical assessment areas were the inferior and anterior wall defects. The image analysis was performed by two NM physicians.

Results: The effect of the independent variable on the dependent variable shows with the p-value being >0.05, non-significance. The scores showed AC-A improved 49% of the image sets and 51% of the image sets did not improve with the overall outcome. However, this score of 51% with no improvement, excludes 18 images of stress studies and nine images of rest studies which showed improvement (scores 2-3) in the inferior wall of the myocardium.

Discussion: The results demonstrated with anterior stress and rest SPECT images, the most artefacts were created with AC-A. Improvement for the stress inferior images is 61% but the stress, as opposed to rest inferior images showed an improvement with a score of 46%. AC-A to the stress and rest images scored an improvement of 49% and 51% for no improvement for the overall outcome.

101

A cross-national validation of the Internet Severity and Activities Addiction Questionnaire

Miss Charlene Omrawo[1], Konstantinos Ioaddinis[2], Jon Grant[3], Nina Lutz[4], Samuel Chamberlain[5], Dan Stein[6], Martin Kidd[7], Christine Lochner[1]

[1]SA MRC Unit on Risk and Resilience in Mental Disorders, Stellenbosch University, Tygerberg, Cape Town, South Africa, [2]Department of Psychiatry, Cambridge University and Peterborough NHS Foundation Trust, Cambridge, United Kingdom, [3]Department of Psychiatry, University of Chicago, Chicago, United States of America, [4]Department of Psychiatry, University of Southampton, Southampton, United Kingdom, [5]Southern Health NHS Foundation Trust, Southampton, United Kingdom, [6]SA MRC Unit on Risk and Resilience in Mental Disorders, Department of Psychiatry, and Neuroscience Institute, Cape Town, South Africa, [7]Dept of Statistics and Actuarial Sciences University of Stellenbosch, Tygerberg, Cape Town, South Africa

Biography:

Charlene is a registered Industrial Psychologist and Medical Researcher with a diversified portfolio and keen interest in Public Health. She holds a Masters' degree from the University of Cape Town and is currently registered with the Health Professions Council of South Africa. Prior to this, she completed undergraduate majors in Clinical and Neuro Psychology, allowing her to deepen her practice as a consulting psychologist. Charlene's research focuses on Problematic Use of the Internet and how it relates to personality predisposition, impulsivity and compulsivity, and health status. Publications are intended to inform possible diagnostic classification, as called for by diagnostic manuals.

Background: Problematic usage of the internet (PUI) describes maladaptive online behaviour which may include preoccupation with the internet and digital media, the inability to control the amount of time spent interfacing with digital technology [1], a continuation of the behaviour despite interpersonal conflict a diminishing social life and adverse work or academic consequences [2][3]. While there is an abundance of screening tools to assess PUI, there is still scope for further improving and refining current instruments, as our understanding of PUI continues to grow [4]. The existing scales are also not typically designed to capture both severity of PUI and the nature of diverse online activities. The Internet Severity and Activities Addiction Questionnaire (ISAAQ), consisting of a severity scale (ISAAQ Part A, severity determination) and an activities scale (ISAAQ part B, activities determination) was developed to expand the current arsenal of tools assessing PUI in that direction. The copyright of the tool rests with the test developers (Chamberlain & Ioannidis) and use of the tool requires permission.

Aim and Objectives: We aimed to validate the ISAAQ severity scale (ISAAQ Part A) and to determine its psychometric properties across three distinct recruitment sites, namely South Africa (SA), the United Kingdom (UK) and the United States of America (US). A second aim was to determine a potential cut-off score indicating the boundary between "normal" and "potentially problematic" internet use.

102

Investigating the association between increased internet usage and specific potentially problematic online activities and six domains of quality of life

Miss Charlene Omrawo[1], Samuel Chamberlain[2], Dan Stein[3], Christine Lochner[1]

[1]SA MRC Unit on Risk and Resilience in Mental Disorders, Stellenbosch University, Tygerberg, Cape Town, South Africa, [2]Department of Psychiatry, University of Southampton, Southampton, United Kingdom, [3]SA MRC Unit on Risk and Resilience in Mental Disorders, Department of Psychiatry, and Neuroscience Institute, University of Cape Town, Cape Town, South Africa

Biography:

Charlene is a registered Industrial Psychologist and Medical Researcher with a diversified portfolio and a keen interest in Public Health. She holds a Masters' degree from the University of Cape Town and is currently registered with the Health Professions Council of South Africa. Prior to this, she completed undergraduate majors in Clinical and Neuro Psychology, allowing her to deepen her practice as a consulting psychologist. Charlene's research focuses on Problematic Use of the Internet and its relation to personality predisposition, impulsivity, compulsivity and health status. Research publications are intended to inform possible diagnostic classification, as called for by diagnostic manuals.

Background: Problematic usage of the internet (PUI) is an umbrella term for describing a broad set of behaviours pertaining to excessive, compulsive, or inappropriate use of the internet, in which an individual typically may be involved in one or more online behaviours, such as internet gaming or online streaming, and is likely to experience withdrawal symptoms when unable to engage in such activities. Research shows that the condition is impacting subjective experiences and perceptions of wellbeing, leading to reduced quality of life (QOL). QOL research is currently limited to specific population groups such as in Asia and the Middle East, and to date no study has produced a report of how of the respective problematic online activities may affect QOL in various life domains such as friends and family, learning/work or self-perceptions. This leads to a lack of understanding as to which degree problematic internet use impacts QOL at a granular level, thus making it challenging to inform policy and contextualize treatment plans for the affected.

Aim and objectives: We aimed to explore the association between increased internet usage and potential PUI in narrower guises of specific problematic online activities (namely general surfing, internet gaming, skills games and time wasters, online shopping, online gambling, social networking, health and medicine, pornography, streaming media, and cyberbullying), and six different domains of QOL (namely leisure time, view of life, creativity, learning, friends and friendship, and view of self) utilizing a large sample of South African adults.

26

A protocol for a systematic review assessing the costs and cost-effectiveness of accessing quality post-injury care for injured persons in low to middle-income countries

Mr Francis Kwame Salman[1], Mrs Janet Ncube[1], Dr Lungiswa Nkonki[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Francis is an aspiring Health Economist currently enrolled in the MPhil Health Systems program at Stellenbosch University. Through the program, he is acquiring specialist knowledge in a wide range of health-related socioeconomic issues including patient outcomes and the effectiveness of care; healthcare quality and patient safety; patient-centered care; as well as healthcare access, utilization, cost, and financing. Francis further plans on obtaining a PhD in Global Health before completing an MBA in Managing Internal Organizations.

BACKGROUND
The World Health Organization predicts that by 2030, injury-related deaths will be the third leading cause of death globally with the economic burden of injuries being disproportionately placed on low and middle-income countries (LMICs).

The objective of this systematic review is to synthesise evidence regarding economic evaluations of quality care for injured persons in LMICs, and to inform decision model development. This systematic review will assess economic evaluation studies' methodological quality and identify evidence gaps.

METHODS AND ANALYSIS
The systematic review will be conducted and reported following the PRISMA guidelines. We will search the following bibliographic databases for economic evaluations that meet our selection criteria: NHS Economic Evaluation Database, Cochrane, Paediatric Economic Evaluation Database, PubMed, Cost-Effectiveness Analysis Registry and Scopus. The primary population will be persons in LMICs who have suffered moderate to severe injuries.

Two reviewers will independently conduct article's title, abstract and full-text screening. In the case of disagreement, the third reviewer will be consulted to facilitate consensus. We will consider the following outcomes from economic evaluations: relative resource use, cost, and Incremental Cost Effectiveness Ratio, Incremental Net Benefit Ratio or Net Present Value. Studies that meet the inclusion criteria will be appraised using the Consolidated Health Economic Evaluation Reporting Standards statement.

ETHICS AND DISSEMINATION
Ethics approval is not required because the study will review existing economic evaluations studies in the public domain. An ethics exemption application has been submitted to the Stellenbosch University Health Research Ethics Committee, and the outcome is pending. The review protocol will be registered with PROSPERO. The systematic review protocol and results will be published in a peer-reviewed journal and presented at relevant scientific conferences.

RESULTS

The search results will be reported using the PRISMA flow chart. The review results will be reported using a narrative summary and tables.

FUNDING

None.

91

The prevalence and associated occupational risk factors of lower back pain among registered nurses at Tygerberg Hospital, South Africa: a cross-sectional study.

Dr Geoffrey Tafaune[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Dr Geoffrey Tafaune is a Specialist in Occupational Medicine, having recently completed his MMed Thesis on the prevalence and occupational risk factors of lower back pain among nurses in a public tertiary hospital, he is passionate about Ergonomics in healthcare workers, ethics in occupational health and healthcare management. Dr Tafaune also has a special interest in the impacts of HIV/AIDS and TB in the workplace having completed a Master of Philosophy degree in HIV/AIDS Management at Stellenbosch University in 2012.

Background
Low back pain (LBP) complaints are the most frequently reported work-related musculoskeletal disorders among nurses worldwide. However, few epidemiological studies on occupational LBP among nurses have been conducted in Africa. The purpose of this study was to assess the prevalence of work-related low back pain and associated risk factors among nursing professionals at a tertiary hospital in South Africa.
Methods
A cross-sectional study design with an analytic component was implemented at Tygerberg Academic Hospital. Data were collected using a self-administered questionnaire, based on the internationally validated Standardized Nordic Questionnaire, modified for local use. Descriptive and inferential statistics were used to analyze data. Alpha level was set at $p< 0,05$.
Results
A total of 280 completed questionnaires were analyzed (response rate 70,0%). The median age of the participants was 47 years (IQR 38,0 - 52,3) and the majority were female (97%). The 12-month period-prevalence of LBP was 73,2% and the lifetime prevalence was 80,7%. Significant risk factors for reported LBP included manual handling (carrying, lifting, or moving) of heavy inanimate materials and medical equipment (aOR: 3,70 95%CI: 1,85 - 7,41). Both working in the adult ICU (aOR: 0,21 95% CI: 0,06 - 0,66) and night shifts (aOR: 0,31 95%CI: 0,14 - 0,73) were found to be protective. However, according to the nurses' perceptions, working in the same awkward position for prolonged periods and continuing to work while injured or hurt were strong contributory factors to low back pain.
Conclusions
Musculoskeletal disorders affect more than 80% of nursing professionals in Tygerberg Hospital, the lower back being the most affected body region. Although several studies have implicated direct manual handling of patients and work-related psychosocial risk factors as predictors of LBP among nurses, this study showed that manual handling of inanimate materials and medical equipment are strongly associated with low back pain.

209

Acceptance test and performance evaluation of new SPECT/CT Gamma Camera

Miss Simone Wiid[1], Mrs Lelanie Nolan[1], Mr Tumelo Carel Godwin Moalosi[1,2]
[1]Tygerberg Hospital , Cape Town, South Africa, [2]Stellenbosch University , Cape Town, South Africa

Biography:
Simoné Wiid grew up in Germiston, Gauteng and completed a BSc. Physics and Chemistry undergraduate degree at the North-West University. She completed her B(Med)Sc. Medical Physics Honours degree at the University of Cape Town with distinctions. Simoné is currently training as a Medical Physicist intern at Tygerberg Hospital. She has developed a passion for nuclear medicine during her training in the nuclear medicine department of Tygerberg Hospital

Introduction The acceptance testing of the new SPECT/CT Gamma Camera is performed by a qualified Medical Physicist to ensure that the manufacturer's performance specifications are met. The acceptance testing consists of various baseline test of which the results are utilised as reference for future routine testing. The SPECT/CT Gamma Camera may not be clinically utilised if the baseline test results are not within the specifications.
Aim The objective of the research study it to perform the acceptance test of Siemens Symbia Intevo Bold™ SPECT/CT gamma camera which is newly installed at the nuclear medicine department of Tygerberg Hospital, Cape Town.
Materials and Methods The acceptance tests are performed on the Siemens Symbia Intevo Bold™ SPECT/CT gamma camera. 99mTc and 57Co radioisotopes are used according to the specifications of the baseline tests. The baseline test performed includes centre of rotation (COR), total SPECT performance, intrinsic and system flood field uniformity, spatial resolution, and sensitivity. Different types of collimator are to be evaluated for the system baseline tests. Test performed on the CT system of the gamma camera includes shielding verification and radiation dose measurements for various clinical protocols.
Results The system spatial resolution, sensitivity, count rate performance, COR and uniformity are well within the specifications of the manufacturer's specifications. The baseline test performed on the CT system confirmed adequate shielding for all areas adjacent to the camera room. The radiation dose measurements for various clinical protocols are below 20 % of indicated dose.
Discussion The results obtained from the baseline test performed are all within the manufacturer's performance specifications.
Conclusion The acceptance test and performance evaluation of the new SPECT/CT Gamma Camera has successfully been completed. The Siemens Symbia Intevo Bold™ SPECT/CT gamma camera can be clinically used in the nuclear medicine department of Tygerberg Hospital, Cape Town.

Theme 5 – Perioperative Sciences / Tema 5 – Perioperatiewe Wetenskappe

205

TOWARDS IMPROVED THEATRE EFFICIENCY

Towards Improved Theatre Efficiency Nadeen Crew[1]
[1]TYGERBERG HOSPITAL, PAROW, SOUTH AFRICA

Biography:
Dr Nadeen Y. Crew
Final year registrar in the Department of Anaesthesiology and Critical Care.
Special interest in theatre efficiency.

Background

At Tygerberg Hospital, theatre slates are booked according to estimates of procedural times by the surgeon. These estimations have been proven to be inaccurate in studies at other institutions, resulting in sub-optimal utilisation of the available theatre time. We conducted this study at Tygerberg to see if this practice contributes to theatre inefficiency.

Objectives

Primary Objective: To determine the average duration of common elective surgical procedures in this institution.

Secondary Objective: To determine if there's a discrepancy between the estimates of procedural times made by surgeons and the actual procedural times for common surgical procedures.

Methods

A retrospective observational study was conducted. Data from January till December 2019 was captured from the hospital's electronic records. We used total anaesthesia time as a surrogate for total procedure time. We selected 32 common elective procedures. The average total procedure time for each procedure was calculated.
The average duration of the five most frequently occurring procedures from this retrospective data was then compared prospectively with the surgeon's time estimates. This data was captured from elective theatre slates over a five-month period during 2021.

Results

The average duration of 32 common elective surgical procedures in this institution has been documented through this research. This data can now be used to inform time estimations for these procedures in the

future. Our research also showed a statistically significant underestimation of procedural time when compared to the actual duration for total abdominal hysterectomies ($p=0.011$), total hip replacement ($p<0.001$), transurethral resection of the prostate ($p<0.001$) and above knee amputations ($p<0.001$). The average time shortfall was 36 minutes for minor and 44 minutes for major surgical procedures respectively.

Conclusion

We anticipate that this data will assist with the accuracy of future procedural time estimates and ultimately have a beneficial effect on theatre efficiency at Tygerberg Hospital.

89

Mesorectum Volumetry in Males with Rectal Cancer: Variabilities Observed in Pre- and Post-Neoadjuvant Radiotherapy Imaging and the Clinical Implications

Ms Daniella Lamprecht[1], Dr Timothy Robin Forgan[2], Dr Amanda Alblas[3], Ms Stephanie Justine Lathe[3], Mr Hein Fourie[4], Mr Lee-Roy Witbooi[5], Prof Karin Baatjes[2]

[1]MBChB II, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Division of Surgery, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]Division of Clinical Anatomy, Department of Biomedical Sciences, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [4]Netcare Medical Physics CoE, Netcare Limited, Cape Town, South Africa, [5]Department of Radiology, Tygerberg Hospital, Cape Town, South Africa

Biography:

Daniella Lamprecht is a second-year medical student at the University of Stellenbosch. She previously received a BSc Physiotherapy (cum laude) and BSc Anatomy (cum laude) degree, both also from Stellenbosch University. Her current research interests are focused on the topic of colorectal cancer and its related surgical interventions.

Introduction: Rectal cancer is a significant health burden on both a global and national scale, requiring a multimodal treatment approach. Neoadjuvant pre-operative radiotherapy has been shown to effectively reduce tumour burden prior to the patient undergoing surgical resection, leading to a more efficacious oncologic excision. The aim of this study is to utilise magnetic resonance imaging (MRI) to describe the variability observed in the volumetry of the mesorectum pre- and post-radiotherapy, prior to surgical intervention, and explore its clinical implications in males with rectal cancer who underwent a total mesorectal excision (TME).

Methodology: Twenty pelvic MRI scans of male patients diagnosed with rectal cancer, confined to the mesorectal fascial layer, who underwent neoadjuvant pre-operative radiotherapy prior to undergoing a TME were retrospectively reviewed and analysed after ethical approval was granted. The volume of the mesorectum was determined on both the pre- and post-radiotherapy scans by planimetric tracing of the area on axial slices, after which a compounded three-dimensional structure was created, and its volume automatically calculated. Subsequent analyses will be done to determine the association of mesorectal volumetry and the surgical outcome of the TME.

Results: Preliminary results show a mean calculated pre-radiotherapy mesorectum volume of 267.03 ± 82.94 cm^3, and a post-radiotherapy volume of 229.75 ± 91.11 cm^3, suggesting a statistically significant difference ($p = 0.01$) between pre- and post-radiotherapy volumetric measurements.

Conclusion: The significant variation in the volumetry of the mesorectum pre- and post-radiotherapy can have important clinical and prognostic implications with regards to the TME in patients with rectal cancer. This study will provide valuable insight into whether the pre-operative interpretation of existing imaging should be used to assess mesorectal volumetry and be used as an opportunity to gain insight and guide surgical decision-making, thereby facilitating the planning of optimal treatment strategies and improve patient outcomes.

70

Histochemical properties of the iliocapsularis muscle: implications for hip function

Ms Kerryn D Mac Dermott[1], Ms Kerri Keet[1], Ms Tertius Kohn[2]
[1]Division of Clinical Anatomy, Stellenbosch University, Cape Town,, South Africa, [2]Department of Medical Biosciences, University of the Western Cape, Cape Town,, South Africa

Biography:
Kerryn Mac Dermott is an MSc Clinical Anatomy student in the Division of Clinical Anatomy, Faculty of Medicine and Health Sciences at Stellenbosch University. Kerryn completed her BSc in Human Life Sciences and Honours in Clinical Anatomy at Stellenbosch University. Her BSc Honours thesis was a human dissection-based study investigating the anatomical features and dimensions of the iliocapsularis muscle. Her MSc research project expands on the Honours thesis and aims to examine the histochemical properties of the iliocapsularis muscle to assist in determining the implication of this muscle for hip function.

Introduction: The iliocapsularis is a deep skeletal muscle that overlies and attaches to the anteromedial hip capsule and is an important anatomical landmark in anterior approaches to hip arthroplasty. Researchers have proposed iliocapsularis helps to stabilise the anterior hip joint and limit impingement of the hip joint capsule between the acetabulum and femoral head during hip flexion. However, no previous study has investigated the morphological and biochemical properties of the iliocapsularis, which could assist in explaining its function. This study aimed to determine the skeletal muscle properties of the iliocapsularis and to compare these to that of six other well-studied muscles in humans.
Methods: A cross-sectional observational study was conducted on 11 recently deceased unembalmed bodies (eight males and three females; mean age 82 years). Muscle samples were harvested and analysed to investigate the skeletal muscle properties of the iliocapsularis, including the fibre type composition, fibre cross-sectional area (CSA), and mitochondrial density. These parameters have been used to compare the poorly studied iliocapsularis to well-studied muscles, namely the iliacus, vastus lateralis, gastrocnemius, tibialis anterior, biceps brachii, and triceps brachii.
Results: Data analysis is currently ongoing. Preliminary finding indicates a difference in muscle fibre type distribution across the muscle groups, with the iliocapsularis containing predominantly more type I fibres than type IIA and IIX fibres. Due to the older cohort, there appears to be a relationship between muscle fibre CSA and age, with a decrease in muscle fibre CSA of type IIA and IIX fibres in advancing age.
Conclusions: Investigating the morphological and biochemical properties of the iliocapsularis will assist in characterising the function of this muscle. Additionally, this will provide surgeons, physiotherapists, and biokineticists with a better understanding of this poorly characterised muscle and may lead to more informed decisions regarding patient care and rehabilitation following injury or hip arthroplasty.

177

Knowledge, Attitudes and Practices of South African
Anaesthesiology Registrars towards Perioperative Point of Care Viscoelastic Testing

Dr Maheshen Padayachee[1]
[1]*Tygerberg Hospital, Bellville, South Africa*

Biography:

Dr Maheshen Padayachee -Registrar (Department of Anaesthesiology and Critical Care)

Qualifications: MBBCH (Witwatersrand, 2015), Diploma in Anaesthesiology (CMSA, 2019)

Special Interests: Perioperative Blood Management

Background
Perioperative Bleeding contributes significantly to patient morbidity and mortality, while the cost of blood products is substantial. Viscoelastic testing ("VET") forms part of the armamentarium for perioperative patient blood management. Presently there is a lack of published literature on the knowledge, attitudes and practices ("KAP") of medical practitioners regarding VET. The objective of this study was to describe the KAP of South African anaesthesiology registrars regarding perioperative point of care VET.

Methodology
A descriptive, cross-sectional study whereby a novel, electronic self-administered questionnaire was used as the data collection instrument. The study population consisted of South African anaesthesiology registrars who were part of the South African Society of Anaesthesiologists electronic mailing list.

Results
71 completed questionnaires were received. 69% of registrars were found to have adequate knowledge. Senior registrars were more likely to have adequate knowledge than junior registrars (statistically significant, p=0.043). 64.7% of registrars had a positive attitude score towards perioperative VET. All registrars felt they would benefit from a formal education platform on VET. The overall median self-rated confidence score for interpreting VET results was 6/10. Senior registrars had a median self-rated confidence score of 6 vs 5 for junior registrars (statistically significant, p=0.005). Registrars stated that a lack of VET consumables and trained technologists to administer the test was the greatest barrier to requesting VET's for patients' at their respective institutions.

Conclusion
Overall knowledge scores were encouraging, however there's room for improvement particularly at the junior registrar level. Targeted educational interventions should be implemented at both a local and national level. The lack of national guidelines should be addressed by a multi-disciplinary team. Locally
developed guidelines can serve as a tool for improving registrar knowledge on VET and can be used for improving uniformity in practices and standards across the various registrar training circuits in South Africa.

203

Investigating a Low-Cost, Nasopharyngeal Apnoeic Oxygenation Technique in a Morbidly Obese Population: A Randomised Controlled Study

Dr Scott Pierpoint[1], Dr Jonathon Burke[1]
[1]*Stellenbosch University and Tygerberg Hospital, Cape Town, South Africa*

Biography:
I am a 4th year Registrar in the Department of Anesthetics and Critical Care. I have completed my part 2 exams and currently completing my training time. This research is my MMed submission. I have an interest in vascular, trauma, airway management and anaesthesia in obese patients.

Background
Obese patients pose anatomical and physiological challenges that may cause rapid desaturation during airway management. Apnoeic oxygenation techniques assist in preventing hypoxia by prolonging safe apnoea time. This study investigated a low-cost, nasopharyngeal apnoeic oxygenation technique, with the aim to establish its efficacy, safety limits and prove its superiority over preoxygenation-alone in an obese population.

Methods
A randomised controlled study was conducted on obese (BMI≥35kg/m²) patients presenting for elective surgery. Patients were allocated by block randomisation to a preoxygenation-only (NoAO) and an intervention (NICA-O_2) group. All patients received preoxygenation, followed by a standardised induction. The intervention group received oxygen at 18l/min via the nasopharyngeal catheter intervention during the apnoea period. The desaturation process was documented until an SpO_2 of 92% was reached, or 600s (10 minutes) elapsed, which was defined as the primary outcome of the study (safe apnoea time). Secondary outcomes were rate of carbon dioxide accumalation and factors affecting the risk of desaturation.

Results
Thirty patients (NoAO=10; NICA-O_2=20) were studied in a morbidly obese population (NoAO=41,1kg/m²; NICA-O_2=42,5kg/m²). The median safe apnoea time was significantly longer (NoAO=262s [IQR 190-316]; NICA-O_2=600s [IQR 600-600]) (Mann-Whitney-U test, $p<0.001$), and the risk of desaturation significantly lower (HR=0,072, 95%CI[0,019–0,283]; Log-Rank test, $p<0.001$) in the intervention group. All 10 patients in the preoygenation-only, and 3 in the intervention group, desaturated to 92% within 600s. The mean rate of carbon dioxide accumalation was significantly slower in the intervention group (NoAO = 0,47±0,14kPa/min; NICA-O_2 = 0,3±0,09kPa/min) (t-test, $p=0.003$). There were no statistically significant risk factors associated with an increased risk of desaturation found.

Conclusions
This is an inexpensive, practical method that improves airway management safety and reduces the risk of desaturation in morbidly obese patients. It provides apnoeic oxygenation that is comparable to high-flow nasal oxygen, and is an effective, low-cost alternative for resource-constrained environments.

Theme 4 - Violence, Injuries, Trauma and Rehabilitation /

Tema 4 – Geweld, Beserings, Trauma en Rehabilitasie

217

Multimorbidity and function in adults with and without HIV in a low-resource setting: Baseline results from a Western Cape cohort

Dr Karina Berner[1], Prof Hans Strijdom[2], Prof Quinette Louw[1]

[1]Division of Physiotherapy, Department of Health and Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Centre for Cardio-metabolic Research in Africa, Division of Medical Physiology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

Biography:

Karina Berner is a researcher in musculoskeletal health and chronic disease, experienced in physiotherapy clinical practice and teaching. After receiving her PhD at Stellenbosch University, she was appointed in the first full-time research post in the Department of Health and Rehabilitation Sciences. Her research and academic interests include multimorbidity epidemiology, HIV-related disability, human motion analysis, and research training. She is the principal investigator of a longitudinal study in the field of multimorbidity and functional outcomes in a semi-rural South African setting, and is involved in collaborative research with the Division of Medical Physiology and the World Health Organisazation.

The prevalence of HIV – now considered a chronic disease – continues to rise in South Africa (SA), paralleled by increasing non-communicable diseases (NCDs) in a relatively young but ageing nation. Modern antiretroviral therapy has reduced HIV-associated mortality; shifting the focus to NCDs. Increased multimorbidity (i.e. two or more co-existing chronic conditions) is becoming apparent, including in people with HIV (PWH). Evidence from high-income countries suggests that multimorbidity contributes to functional decline, poor mental health and reduced quality of life. Unfortunately, the person-centred, functional sequelae of multimorbidity (including in the context of HIV) remain poorly characterised and for lower resourced settings including SA, longitudinal evidence is non-existent. This is the first study that will prospectively explore such relationships in a low-resource setting. The aim is to describe multimorbidity and functional status in adults with and without HIV from a semi-rural SA community, to explore temporal relationship between multimorbidity and functional status and to ascertain if these outcomes share predictors. The ongoing study compares adults differing in HIV, multimorbid and functional status using a non-interventional, prospective design. A primary care community clinic is the study setting. Person-centred outcomes include self-reported activity limitations, fall history and mental health, and functional performance tests. Statistical analyses include descriptive statistics, chi-square tests, ANOVA, multivariate regression and repeated measures models. We are currently cross-sectionally analysing baseline data for n=113 participants (89 PWH and 24 HIV-free) with a mean age of 43.6 (9.4) years. Here, we will present descriptive baseline results. We will re-assess and ultimately determine temporal trends in the study outcomes upon completion of the 18-month follow up. Amidst the burgeoning chronic disease burden in SA, understanding mechanisms influencing person-centred outcomes along with modifiable risk factors can contribute to optimising function and inform morbidity prevention. Consequently, personalised care, QOL and healthcare expenditure may be improved.

66

Isoniazid poisoning exposures as reported in enquires to the Poisons Information Helpline of the Western Cape: June 2015 – May 2020

Mrs Catharina du Plessis[1], Mr Gonwayne Voigt[1], Dr Cindy Stephen[2], Mrs Carine Marks[1]
[1]Division of Clinical Pharmacology, Stellenbosch University, Cape Town, South Africa, [2]Department of Paediatrics and Child Health, University of Cape Town, Cape Town, South Africa

Biography:
Arina is a Specialist in Poison Information at the Tygerberg Poisons Information Centre for the last 12 years. She is also a lecturer in Toxicology for the Postgraduate Diploma in Medical Toxicology.
Her research interest include biological toxins and pesticide poisonings.

Objective: Tuberculosis (TB) is a major health concern in South Africa with an estimated infection rate of more than 350 000 infections per year. Isoniazid (INH), used as a first-line agent for treatment of TB; can cause seizures, metabolic acidosis, and coma in severe poisonings. Additionally, INH is indicated as TB preventive therapy in adult patients diagnosed with HIV. The availability of INH in many households, make it a concern for exposures. The aim of the study was therefore to describe cases of poisoning exposures of INH reported to the Poisons Information Helpline of the Western Cape (PIHWC).
Methods: We conducted a retrospective review of calls to the PIHWC related to INH exposures during a five-year period (June 2015 – May 2020). All human-related INH poisoning exposure data collected were extracted. Key variables included patient demographics, circumstances of exposure, clinical presentation, and severity of clinical features.
Results: There were 528 enquiries reported to the PIHWC regarding INH exposures. In one case more than one INH containing product was ingested. The majority of the enquiries were received from medical professionals, 525 (99.4%), involving more females 388 (73.5%) than males 137 (26.0%). In adults; 389 (73.7%) exposures were recorded and 93 (17.6%) in the 13-19 year age group. Only 42 (8.0%) poisoning exposures occurred in children. Overall, self-harm was the main cause of exposures, 479 (90.7%). Severe or life-threatening symptoms and signs (PSS3) were recorded in 80 (31.0%) poisoning exposures. Seizures were recorded in 254 exposures (48.1%), while 86 (16.3%) patients were asymptomatic at time of enquiry. More than one substance was ingested in 227 (43.0%) exposures.

Conclusion: Due to the easy access in many households, the concern is that severe INH exposures are likely to increase in frequency. Clinicians should be aware of the risk and severity associated with INH exposures.

90

Effectiveness of therapeutic massage versus other or no therapy on depression, CD4+ count, and quality of life in people with HIV: systematic review and meta-analysis

Ms Daniella Lamprecht[1], Ms Carla Marais[2], Ms Jessica Merlin Neuhoff[2], Ms Melissa Hack[2], Mr Wilhelm Mulder Zaayman[2], Dr Nassib Tawa[2,3], Ms Maria Yvonne Charumbira[2], Dr Karina Berner[2], Prof Quinette Louw[2], Mr Dominic Fisher[2]

[1]MBChB II, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]Division of Physiotherapy, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]Center for Research in Spinal Health & Rehabilitation Medicine, Department of Physiotherapy, College of Health Sciences, Jomo Kenyatta University of Agriculture & Technology, Nairobi, Kenya

Biography:

Daniella Lamprecht is a second-year medical student at the University of Stellenbosch. She previously received a BSc Physiotherapy (cum laude) and BScHons Anatomy (cum laude) degree, both also from Stellenbosch University. Her current research interests are focused on the topic of colorectal cancer and its related surgical interventions.

Background: Modern antiretroviral therapy (ART) has improved the life expectancy of people living with HIV (PLWH). However, HIV is often accompanied by morbidities related to the virus and its treatment, including depression, that may be associated with reduced immune function and quality of life (QOL). Therapeutic massage has been proposed as a cost-effective, scalable complementary treatment for PLWH to improve person- and immune-related outcomes.

Objectives: To systematically search, critically appraise, and synthesise the best evidence on the effectiveness of therapeutic massage compared to other/no interventions on depression, CD4+ cell count, and QOL in people of all ages living with HIV.

Method: The review included randomised controlled trials (RCTs) of all languages scoring a minimum of 3 on the PEDro scale. Five databases were searched in August 2021. Search terms related to HIV, massage, complementary therapy, depression, CD4, and QOL. Where possible, homogeneous data for review outcomes were statistically pooled.

Results: Five RCTs were included (mean PEDro score = 5.6). Most trials hailed from high-income countries. Trials were heterogeneous regarding many clinical characteristics. Massage significantly improved depressive symptoms in PLWH (p=0.0003). No statistically significant effects of therapeutic massage on CD4+ count (p=0.62) or QOL (p=0.80) were found in meta-analyses, although evidence from individual trials suggests improved CD4+ count in certain circumstances.

Conclusion: Therapeutic massage significantly improves depressive symptoms in PLWH when used according to recommended dosages. For future clinical practice and research, massage combined with other modalities should be investigated, and particularly so in low-resourced settings.

154

Acute kidney injury in burn victims

Luthando Vazi[1], Dr Yazied Chothia, Dr Wayne Kleintjes
[1]*Tygerberg Hospital, Parow, South Africa*

Biography:
Medical registrar with a special interest in Nephrology

Background
Acute Kidney Injury (AKI) remains a common complication of burn victims, which is associated with high morbidity and mortality. The study objectives aimed to identify the incidence of AKI in all burn patients, causes of AKI and in-hospital mortality.

Methods
A retrospective cohort study was conducted on patients admitted to Tygerberg Hospital Burn Unit from 1 April 2018 to 31 March 2019. All burn patients over 18 years were included. Patients with end stage kidney disease, cold burn wounds, skin donors or readmission were excluded. KDIGO criteria was used to define AKI. Multivariate logistic regression was performed to identify predictors of AKI and death. Kaplan-Meier survival analysis was also performed.

Results
A total of 215 patients were included in the study with 58 (27%) developing AKI. The distribution of AKI by KDIGO stage one, two and three were 59%, 28% and 14%, respectively. The most common burn mechanisms were open fires (37%) and shack fires (17%). Patients with AKI had a higher abbreviated burn severity index (ABSI) score (7 vs. 5, P<0.01), required more mechanical ventilation (69% vs. 33%, P<0.01), had more sepsis (35% vs. 12%, P<0.01). Predictors of AKI included ABSI score (adjusted OR [aOR] 1.35, P=0.04), high admission lactate (aOR 1.64, P=0.04) and male sex (aOR 4.22, P=0.01). Mortality was higher in patients with AKI (34% vs. 6%, P<0.01). Only the ABSI score (aOR 2.46, P<0.01) predicted death. On survival analysis, AKI was associated with higher mortality (log-rank, P<0.01).

Conclusion
This study showed a high prevalence of AKI in burn victims requiring tertiary care and was associated with high mortality. By improving the conditions of patients living in informal settlements, the frequency of burns and its complications may be avoided.

Theme 6 - Maternal and Child Health / Tema 6 – Moeder en Kind Gesondheid

201

The experiences of caregivers of children with respiratory illnesses during the COVID-19 pandemic

Miss Michaile Anthony[1], Dr Graeme Hoddinott[1], Ms Tembeka Mhlakwaphalwa[1], Mrs Margaret Van Niekerk[1], Dr Isabelle Dewandel[1], Dr Carien Bekker[1], Associate Professor Marieke Van der Zalm[1]
[1]*Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, South Africa*

Biography:
Michaile Gizelle Anthony is a Junior Study coordinator and has a Master of Arts in Psychology. She is a registered Research Psychologist and Registered Counsellor with the Health Professions Council of South Africa. She has over 4 years of experience in TB/HIV research. My research focuses on understanding a) quality of life among children diagnosed with a respiratory illness, b) developing quality-of-life tools to measure the impact of respiratory illnesses c) understanding the burden of providing care to children diagnosed with respiratory illnesses and d) understanding and explaining the socioeconomic contexts of families of children diagnosed with respiratory illnesses.

BACKGROUND
The COVID-19 pandemic is known to have multiple impacts on families globally. Children presenting with symptoms of respiratory illness are both directly and indirectly affected by emerging health system, economic and social changes in the era of COVID-19. We explored the experiences of caregivers in the day-to-day care of children with a respiratory illness in South Africa during the COVID-19 pandemic.

METHODS
We conducted 21 semi-structured in-depth interviews with caregivers whose children (0-10-years-old) were diagnosed with a respiratory (with and without SARS-CoV-2 infection) in Cape Town, South Africa from November 2020 till March 2021. We used case descriptive analysis and thematically organised common and divergent experiences.

RESULTS
Taking care of sick children was emotionally taxing on caregivers, making them feel insecure, anxious, frustrated, and helpless – this was exacerbated by the COVID-19 pandemic. COVID-19 made caregivers' choice to seek care more complicated. E.g., multiple family members offering opinions on symptom severity and whether to access care. Caregivers had difficulties adjusting to COVID mitigation strategies e.g. having to administer medication to the child normally provided by medical staff and routinely sanitise the room for medical staff to enter. The experiences within the hospital were described as difficult due to no visitors being allowed, and health workers limited time to help patients.

CONCLUSION
This study shows how providing care for a child with a respiratory illness in the context of the COVID-19 pandemic has become complicated and can adverse impacts on caregivers' emotional wellbeing and health

seeking behaviour. Health workers could utilize these experiences to strengthen health services and coping strategies for future waves.

218

Long-term impact of SARS-CoV-2 infection in children presenting to Tygerberg hospital during the COVID-19 pandemic in Cape Town, South Africa

Dr Isabelle Dewandel[1], Dr Carla Mckenzie[1], Mrs Margaret van Niekerk[1], Dr Andrew Redfern[2], Dr Lilly Verhagen[1,3], Miss M Claassen[4], Mrs Shannon Wilson[4], Prof Gert van Zyl[4], Prof Helena Rabie[2], Prof Marieke van der Zalm[1]

[1]Desmond Tutu TB Centre, Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, , , [2]Department of Paediatrics and Child Health, Stellenbosch University, Cape Town, South Africa, , , [3]Radboud UMC Amalia Children's Hospital, Department of Pediatric Infectious Diseases and Immunology, Nijmegen, Netherlands, , , [4]Division of Medical Virology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, ,

Biography:

Isabelle Dewandel is a paediatrician with a keen interest in paediatric infectious diseases, mainly tuberculosis and respiratory infections. She joined the Desmond Tutu TB Centre at Stellenbosch University in Cape Town, South Africa in 2020 to be part of the paediatric platform with main focus on paediatric tuberculosis, lung health and COVID-19 research.

Background: Little is known about long-term impact of COVID-19 in children in low-middle income countries.

Methods: In this prospective observational cohort study, children aged 0-13 years were recruited from Tygerberg Hospital, Cape Town, South Africa between June 2020 and September 2021, presenting with either 1) acute respiratory illness, 2) confirmed COVID-19 PCR or 3) COVID-19 contact. Clinical data and serum samples were obtained at baseline and children were followed 3 months and 1 year later in a subgroup.

Results: A total of 100 children were enrolled, median age 7 months (interquartile range 2.0-32.5 months), 61 (61%) male; 2 (2%) HIV-infected and 25 (25.3%) HIV-exposed. A total of 44 (44%) children tested COVID-19 PCR positive, without significant difference in demographic characteristics according to COVID-19 status. Underlying comorbidities were seen more frequently in COVID PCR positive cases (40.9%) compared to COVID negative cases (33.9%) (p=0.47). One year after initial enrolment 12/41 (29.3%) children had persistent or recurrent symptoms and were more likely to be COVID-19 PCR positive (60%) versus COVID-19 negative (19.4%; p=0.04). A total of 40/100 (40%) children were readmitted, without significant difference between children with or without previous COVID-19 diagnosis (40.9% versus 39.3%, p=0.87). At baseline SARS-CoV-2 antibodies were found in 43/85 (50.6%) versus 31/39 (79.5%) 1 year later. Rising immunity was observed in both COVID-19 PCR positive and negative children (72.2% baseline versus 90% week 52, p=0.157 and 34.7% baseline versus 75.9% week 52, p=0.177, respectively).

Conclusion: Children with confirmed SARS-CoV-2 infection were more likely to have symptoms 1 year later. An upward trend of SARS-CoV-2 immunity for COVID-19 PCR positive and negative children was seen over time, which likely reflects community transmission in the population with asymptomatic illness.

Keywords: Paediatric; COVID-19; Long COVID; SARS-CoV-2 antibodies

263

The influence of haematological profiles on the transfusion and mortality risk of mothers presenting to the obstetric unit of a South African tertiary medical facility

Dr. Michael Linström[1], Zivanai Chapanduka, Ernest Musekwa, Liesl de Waard
[1]*Stellenbosch University / NHLS, Cape Town, South Africa*

Biography:
Third year registrar in the division of haematological pathology.

Introduction: Abnormal haematological laboratory parameters are frequently seen in pregnant mothers. The abnormalities relate to pregnancy and associated risks including age, complications and nutritional status. These abnormalities may increase the likelihood for transfusion, increasing morbidity and mortality.

Aim: To describe the age, haematological profiles and associated laboratory parameters of obstetric patients presenting to a labour ward and correlate the findings to the transfusion of blood and blood products and the associated maternal mortality.

Method: A retrospective descriptive study of haematological profiles and transfusion history of pregnant mothers admitted to a tertiary hospital, was conducted over two years. Age, anaemia, iron deficiency, leucocytosis, thrombocytopenia, coagulation and HIV status were investigated as independent risks for transfusion. Anaemia and transfusion were investigated as independent risks for mortality.

Results: A total of 12889 patients were analysed. The highest prevalence of anaemia (31.5%) and the highest probability for transfusion (OR = 1.76, CI 95% 1.44 – 2.14), were in mothers below the age of 19 years. Mothers presenting with anaemia (OR = 6.55, CI 95% 5.85 – 7.34), leukocytosis (OR = 2.38, CI 95% 2.10 – 2.75) and thrombocytopenia (OR = 4.28, CI 95% 3.53-5.20) had increased likelihood for transfusion. Patients presenting with a prolonged prothrombin time and iron deficiency anaemia (IDA) received 2-5 times more blood products (Median packed red cells, 4 IQR = 2 and 10 IQR = 1 units respectively). Patients presenting with anaemia (OR = 4.15, CI 95% = 2.03 - 8.49) and blood transfusion exposure (OR = 3.6, CI 95% = 1.75 - 7.47) had increased mortality.

Conclusion: Adolescence, anaemia and IDA expose mothers to unacceptably high risks for transfusion and mortality. Many of these risk factors could be mitigated prior to labour. Presenting haematological profiles are strong predictors of maternal outcome and transfusion risk.

37

Prevalence of anaemia in pregnancy in Vhembe district, South Africa.

Dr Mulimisi Ramavhuya[1]
[1]*Stellenbosch University, Cape town, South Africa*

Biography:
Dr Mulimisi Ramavhuya is a family physician working in a district hospital in Vhembe district, Limpopo province, South Africa. He is currently an MPhil Family Medicine student.

Abstract

Background
Anaemia in pregnancy is an indicator of poor nutrition and is associated with worse pregnancy outcomes. The World Health Organization (WHO) has set a target of 50% reduction in prevalence of anaemia by 2025. South Africa aims to achieve a haemoglobin of >10g/dl for 80% of women at delivery by the year 2023. This study aimed to assess its prevalence of anaemia in pregnancy and associated factors in Vhembe district.

Methods
A descriptive cross-sectional survey of women attending antenatal care in April-June 2021. A sample of 419 pregnant women was obtained and data collected from the maternity case records as well as a brief medication questionnaire.

Results
The prevalence of anaemia in pregnancy in Vhembe district was 32.2%. Of those with anaemia, 58.7% were mild, 38.4% were moderate and 2.9% were severe. Adherence to prescribed oral supplements was 96.5% for iron and 97.3% for folic acid. Reported stock out for iron and folic acid supplements was 27.2% and 30.5% respectively. The mean age of the sample was 26.7 years (SD6.2) while the median gestational age was 30 weeks (IQR 21 to 38). The median gestational age at booking was 16 weeks (IQR 10 to 21) and median parity was 1 child (IQR 0 to 2). Majority of pregnant women with anaemia had food insecurity.

Conclusion
The Vhembe district prevalence of anaemia in pregnancy is a moderate public health problem. Food insecurity appears to be the main factor associated with anaemia in pregnancy in Vhembe district.

69

A description of recent research literature in Early Communication Intervention (ECI) in South Africa, with a particular focus on research topics and recommendations: a scoping review

Cheron Rudolf[1], Jaimee Buchan[2], Nicole Smithdorf[3], Deidre Fouche[4], Berna Gerber[5]
[1]Division of Speech-Language and Hearing Therapy, Stellenbosch University, Cape Town, South Africa, [2]Division of Speech-Language and Hearing Therapy, Stellenbosch University, Cape Town, South Africa, [3]Division of Speech-Language and Hearing Therapy, Stellenbosch University, Cape Town, South Africa, [4]Division of Speech-Language and Hearing Therapy, Stellenbosch University, Cape Town, South Africa, [5]Division of Speech-Language and Hearing Therapy, Stellenbosch University, Cape Town, South Africa

Biography:
Cheron Rudolf is a final-year speech-, language- and hearing therapy student at the University of Stellenbosch. As part of her degree requirements she is currently involved in a research project focused on Early Communication Intervention in South Africa. The project embraces her academic interests which include health communication and multilingual and multicultural issues faced by the black and brown communities of South Africa. She hopes to contribute even more to these areas of research as a post-graduate student.

Background: South Africa is a country with a high prevalence of environmental risk-factors for developmental delays or disorders coupled with poor access to healthcare. Infants and toddlers with a communication developmental delay or disorder may face far-ranging negative effects if adequate early intervention is not provided. To provide effective early communication intervention (ECI) clinicians must have access to contextually relevant and up-to-date scientific information. The human resources for research on ECI in South Africa are limited. Knowledge about the topics that are studied locally, recommended for study, or underrepresented in the existing literature would aid their research efforts and can be used to determine research priorities.

Objectives: To describe the current research literature in ECI, specifically to determine what topics researchers are interested in and what their recommendations for future research are.

Method: A scoping review methodology based on the latest guidance by the Joanna Briggs Institute and PrismaScR checklist was followed. Five electronic databases were searched. Manual searches and searching through reference lists were also conducted. All studies with a focus on ECI within the scope of speech-language therapy in South Africa, published in English or Afrikaans, between 2016 and 2022 were included. Information from a final selection of 20 studies was entered into a charting table and analysed using basic qualitative and frequency counting techniques.

Results: ECI research in South Africa has focused on a range of topics such as, stakeholder's perceptions, effects of early intervention, and language- and speech assessment instruments. Recommendations for future research primarily focused on expanding sample sizes and diversifying participant groups and research settings across linguistic, cultural and socio-economic groupings.

Conclusion: Researchers may benefit from pooling their resources to produce the knowledge most needed by South African early interventionists and their clients.

Keywords: Child, preschool, infant, newborn, toddler, paediatric, high risk neonate, caregiver

48

Food handling practices and nutrition knowledge and attitude of staff at Early Childhood Development centers in the Western Cape Metropole, South Africa.

Mrs Yolande Smit[1], Prof Lisanne Du Plessis[1], Prof Rafael Perez- Escamilla[2]
[1]*Stellenbosch University, Cape Town, South Africa,* [2]*Yale School of Public Health, New Haven, USA*

Biography:
Yolande Smit is a registered dietitian and lecturer at the Division of Human Nutrition at Stellenbosch University since 2012. She obtained her BSc Dietetics and Master of Nutrition degrees from Stellenbosch University.
She coordinates and teaches various undergraduate modules and is also involved in undergraduate research and post graduate supervision. She is a registered PhD candidate (2020).Her focus area is the nutrition environments at child day care centres aiming to improve standardization and implementation of meal provision guidelines at ECD centres.
Besides teaching and learning other fields of interest are food service management, consumer behaviour and childhood nutrition.

Background: Early childhood development centres (ECDCs) provide a potential environment where children can develop healthy eating behaviors. A well-planned menu, prepared in a safe and nutritious way can meet up to a third of a young child's daily dietary needs whilst in a day-care facility. Objectives were to evaluate the food preparation environment, staff food handling practices and nutrition knowledge and attitudes of staff in promoting healthy eating.

Methods: A cross-sectional, descriptive study was conducted. An observational audit was completed at 46 randomly selected ECDCs. Census sampling of ECD staff was done. Staff (N=162) completed a self-administered nutrition knowledge questionnaire.

Results: Mean overall score for the observational audit was 50% (SD 11.78). Highest scores were obtained for personal hygiene (86.5%; SD 11.17), although regular handwashing was not observed (34.7%). Dry store storage scored 72.6%. Food handling practices had a mean score of 48.8%. Cleaning of work surfaces were insufficient (54.7%). Only 23.9% Of ECD centers had a separate meal area and staff sat with children during mealtimes (84.7%). Mean nutrition knowledge of ECD staff were 69.9% (SD 10.15). Lowest scores related to calcium-rich foods (17.3%) incorrect practice of replacement of fruit with fruit juice (38.2%), safe meat defrosting (30.8%) and safe storage of meat products (27.7%). The majority of staff (68%) disagreed with the statement: "It is only the parents' responsibility to ensure children eat healthy". A statistically significant association was found between higher staff education level and disagreeing with this statement (p=0.042).

Conclusion: There is substantial opportunity for improvement in the food environment at ECDCs in the Western Cape Province, SA. Regular monitoring should be a priority to ensure implementation and adherence to food provision guidelines with the aim of protecting and promoting the health of children attending ECDCs.

35

Impact of a multi-strain probiotic on healthcare-associated bloodstream infection incidence and severity in preterm neonates

Mrs Marwyn Sowden[1], Prof Mirjam Maria van Weissenbruch[2], Dr Andre Nyandwe Hamama Bulabula Bulabula[3], Prof Angela Dramowski[1], Dr Carl Lombard[1], Dr Evette van Niekerk[1]
[1]Stellenbosch University, , , [2]Amsterdam UMC, , , [3]Infection Control Network, ,

Biography:
Mrs Marwyn Sowden previously worked at NICUS and the MRC. Thereafter she did consultation work as well as part-time lecturing at Stellenbosch University, University of Cape Town, University of the Western Cape and Tiervlei Trial Centre. She is well known as a clinical dietician and assists at various private hospitals as a locum. She is pursuing a dual PhD in Nutritional Sciences at Stellenbosch University and University of Amsterdam and holds a M in Nutrition and a BSc in Dietetics both from Stellenbosch University. Her research passion lies in the area of paediatric nutrition.

Background: Hospital acquired bloodstream infection (HA-BSI) is a major contributor to morbidity and mortality in preterm, very low birthweight infants, especially in low-to-middle- income countries (LMIC).
Methods: We conducted a double-blind, placebo-controlled, randomized clinical trial to investigate the effect of a multi-strain probiotic formulation (LabinicTM) on the incidence and severity of HA-BSI in preterm neonates.
Results: Two hundred neonates (100 per arm) were included in the trial. Fifteen neonates developed HA-BSI events (2 in the probiotic arm and 13 in the placebo arm). The median day of life at HA-BSI onset for the probiotic group was 10.5 ±3.5, and placebo group was 11.2 ±6.4. The incidence of HA-BSI in neonates receiving the probiotic was significantly lower compared to those receiving the placebo (0.93 versus 5.99 HA-BSI events/1000 neonate-days; incidence rate ratio (IRR) of 0.156 [95% CI: 0.017 to 0.691], p = 0.0046). Calculating incidence rate of the combined outcome (sepsis/death) was also lower in the probiotic versus placebo groups (2.34 versus 6.45 events/1000 neonate days; IRR 0.33 (95% CI: 0.11 to 0.97), p =0.043.
Conclusion: The use of a multi-strain probiotic significantly reduced HA-BSI incidence in this cohort of preterm neonates.

87

Sleep Habits And Sleep Hygiene Practices Of South African Primary School-Aged Children: An Exploratory Study

Mrs Tanya Wood[1], Dr Nadine Rampf[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
My name is Tanya Wood and I have a BSc in Life Sciences from the Univeristry of South Africa. I am a mature student in the Honours program of Morphological Sciences at Stellenbosch Univeristy, Clinical Anatomy division. I am fascinated with the impact of sleep health and hygiene practices and their implication on physiological and psychological health of children and their families. I have two young children and a loving husband.

Background:
Insufficient sleep has adverse effects on the physiological and psychological well-being of children and their families. Reports indicate that children's sleep health is declining; however, comparable data on the South African paediatric population is lacking. This exploratory study aimed to examine the sleep health of primary school-aged children in a South African context.

Methods:
Parents/legal guardians of South African children (6 – 11 years) attending primary school were recruited through social media platforms and asked to complete an online survey. The survey captured basic biographical information and information on the sleep habits (Children's Sleep Health Questionnaire, CSHQ) and sleep hygiene practices (Children's Sleep Hygiene Scale, CSHS) of their child.

Results:
Of the 414 responses, 189 were included in the data analysis. Responses were received from all nine South African provinces; the highest response from the Western Cape (38.1%) followed by Gauteng (30.7%). The mean age of the study population was 8.0 ± 1.7 years (mean ± SD) and 50.1% were male. Of the children surveyed, 50.8% attended government schools. The mean parental report of sleep duration was 9.23 ± 2.06 hrs. The mean total sleep disturbance score based on the CSHQ was 47 ± 8.3 with 77% of children scoring ≥ 41, indicating the presence of a possible sleep disturbance. The mean sleep hygiene index was 27.9 ± 3.4. Linear regression analysis revealed a significant correlation between total sleep disturbance and sleep hygiene scores ($R2 = 0.32$, $p < 0.001$); low sleep hygiene index scores were associated with a higher total sleep disturbance score.

Conclusion:
While the reported sleep duration for South African primary school-aged children was within the recommended range (9 – 11 hrs) for this age group, the overall presence of possible sleep disturbances was high. These disturbances could potentially be attributed to poor sleep hygiene practices.

Theme 7 – Health Professions Education / Tema 7 – Gesondheidsberoepe Onderwys

161

A study of patient- reported pain during bone marrow aspiration and biopsy using local anaesthesia with intravenous midazolam co-administration at Tygerberg Hospital in South Africa

Dr Fatima Alzanad[1], Dr Merga Feyaza[2], Dr Zivanai Chapanduka[3]

[1]Division of Haematological Pathology, Department of Pathology, National health Laboratory service, Tygerberg Hospital, and Stellenbosch university, Cape Town, South Africa, [2]Division of Epidemiology , Dept of Global Health , Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]Division of Haematological Pathology, Department of Pathology, National health Laboratory service, Tygerberg Hospital, and Stellenbosch university, Cape Town, South Africa

Biography:

Dr Fatima Alzanad a haematopathology consultant at Tygerberg Hospital. Graduated from Stellenbosch university first semester 2021.

Introduction: During the bone marrow aspiration and biopsy (BMAB) procedure, patients report pain of widely variable intensity. There is limited literature on the factors associated with the pain. The use of local anesthesia (LA) only is still widespread although it does not abolish the pain. Midazolam is the most commonly used benzodiazepine for conscious sedation. Our centre introduced universal midazolam sedation unless there is a contraindication to its use, 4 years ago. This study assessed the impact of the universal use of intravenous midazolam for BMAB compared to use of LA only. The factors associated with the pain of BMAB, were analysed.

Methods: A retrospective cross-sectional study was performed on adult patients who had a BMAB procedure from 1st July 2018 to 30th March 2019. A questionnaire incorporating a visual analogue pain scale, was used for data collection.

Results: A total of 182 BMAB procedures were included in the study. Pain was reported in all procedures performed under LA and only in 29.1% of procedures performed with midazolam. Age, sex, race, level of educations, body mass index (BMI) indication and diagnosis had no influence on pain. Patients who had previous BMAB experienced less pain. Experience of operator had a significant effect on pain. Midazolam dose showed negative correlation with pain.

Conclusion: LA only is not enough to abolish pain of BMAB. Midazolam conscious sedation used with LA reduces pain to acceptable levels. Patients with previous experience of BMAB under midazolam premedication reported less pain. Furthermore, the experience of operator reduced the pain significantly.

43

A handheld, wireless ultrasound probe to learn anatomy: perceptions of medical undergraduate students

Miss Johanna Maria De Lange[1], Miss Janine Correia[1], Dr Chad Marthinussen[2], Prof Karin Baatjes[1]
[1]Stellenbosch University, , South Africa, [2]U-Image Medical, , South Africa

Biography:
My name is Johanna Maria (Andria) de Lange and I am currently studying BSc Honors in Clinical Anatomy at Stellenbosch University. I completed my BSc Human Life Sciences undergraduate degree in 2016, after which I completed my Postgraduate Certification in Education (2017) and went on to pursue a career in teaching, this being one of my passions in life. However, as community work has always been close to my heart, I also worked for a non-profit company. I believe that one needs to be the change one wants to see in the world, by living with hope and spreading joy.

Background: Point-of-Care-Ultrasound has become an important part of patient care across various medical specialties and the increased use thereof has led to a greater demand for the integration of ultrasound training in the early medical undergraduate curriculum. The use of portable wireless ultrasound devices is not currently integrated within the undergraduate medical anatomy curriculum of Stellenbosch University and the additional value of wireless ultrasonography, in relation to the clinical practice of anatomical knowledge, therefore, warrants further investigation.

Aim: This study aims to explore undergraduate medical students' perceptions on the use of handheld wireless ultrasound scanning to enhance their knowledge and understanding of Anatomy for clinical application.

Study design and method: A cross-sectional descriptive quantitative study was carried out among the third-year medical students at the Division of Clinical Anatomy. During the routine dissection session, students were able to visualize anatomical structures of the musculoskeletal system, by scanning themselves, using a handheld, wireless ultrasound device. Both a sonographer and clinician were present to provide an introductory session. After the ultrasound session, an electronic survey was distributed to the students for completion. Three ultrasonography questions were also included in the routine practical test.

Results: The results from the ultrasonography questions within the routine practical test are being analyzed and thus far, 40 responses have been captured from the distributed survey. Upon closure of the survey at the end of July, statistical- and thematic analysis of the responses will be conducted.

Conclusion: This study will provide valuable insights on medical students' perceptions on the usage of portable wireless ultrasound to enhance their knowledge and comprehension of anatomical content, for promotion of clinical application, to improve the healthcare system and patient outcomes, especially in under-resourced areas.

190

Low-dose localised electron radiotherapy in a case of refractory mycosis fungoides

Dr George Joram[1], Dr Henriette Burger[1], Dr Willem Visser[1], Dr Zainab Mohamed[2]
[1]Stellenbosch University, Cape Town, South Africa, [2]University of Cape Town, Cape Town, South Africa

Biography:
I'm currently third year MMed student in Radiation Oncology at Tygerberg Campus/Hospital. My main interest is in Gynecological and urology cancers especially in Brachytherapy treatment.

Abstract
We present a case of refractory mycosis fungoides (MF) that responded to low-dose localised electron radiotherapy. A 59-year-old man presented with a 5-year history of a generalised, pruritic, scaly, red skin rash that had recently become more nodular. Skin biopsy confirmed MF. After a variable initial response to topical steroids and oral methotrexate, progressive tumours were treated with low-dose electron radiotherapy. We describe the clinical effect of different radiation doses and fractionation schedules applied over a 2-year period. Our experience in this case of MF suggests that low-dose localised electron radiotherapy offers excellent palliation by effectively resolving tumorous lesions, improving quality of life and allowing for retreatment of refractory lesions.

106

A retrospective analysis of the microbiological status within the radiopharmacies of Tygerberg Hospital

Mr Jayed Oliver[1], Ms Bolutife Adedeji[1], Dr Jannie Le Roux[1,2], Dr Janke Kleynhans[1]
[1]Division of Nuclear Medicine Stellenbosch University, Cape Town, South Africa, [2]Node of Infection Imaging Stellenbosch University, Cape Town , South Africa

Biography:
Jayed Oliver graduated in in 2018 from the University of the Western Cape with a B.Pharm degree. He performed his internship at Clicks Pharmacy and his Community service year at Mthatha Correctional Services registering as a Pharmacist in 2019 at the South Africa Pharmacy Council. He is currently enrolled for an MSc in Nuclear Medicine to specialize as a Radiopharmacist, at Stellenbosch University Division of Nuclear Medicine. He is working full-time at Axim Radiopharmaceuticals, performing the scope of practice of a Radiopharmacist.

The current Good Radiopharmaceutical Practice guidelines are set by the European Association of Nuclear Medicine as a reference for the quality standards which need to be met. EU guidelines discuss a classification system for the manufacturing environment namely: grade A - local zone for potential high-risk operations made possible through the use of a LAFW, grade B - aseptic preparation and filling in the background for grade A environments as well as grade C and D - clean areas used in the carrying out of less critical stages.

Blood agar settle plates were placed in the laminar airflow cabinet (LAFC) and cleanrooms at different intervals. These were then sent to the NHLS and the results were analyzed to see trendlines over time. The 10th floor Radiopharmacy is not a cleanroom and is therefore unclassified. However, the microbiological colony count was acceptable being an average of 7 ± 7 colony counts. The PET Radiopharmacy cleanroom has a significantly cleaner environment appropriate for the class C levels at 2.6 ± 3 counts. From April 2021 till March 2022 a total of 3/19 samples was out of specification in the 10th floor Radiopharmacy LAF. However, no value exceed 1 colony. From March 2022 to July 2022 the monitoring of the PET LAF commenced. A total of 11/41 samples was out of specification. A high amount of out of specifications was reported during March and April (5/7 and 6/9 respectively) with levels being more appropriate at 0/12 in May, 3/9 in June and 0/3 in July after data were disseminated to staff.

There is lack of implementation of uniform sampling practices across the Radiopharmacies. The 10th floor radiopharmacy is currently undergoing an upgrade to “clean room” status to allow for stricter environmental controls, the impact of which will require further investigation.

146

Evaluation of prepurifications method for the gallium-68 eluate from the iThemba LABS germanium-68 generator

Ms Monique Friesslaar[1,2], Dr Janke Kleynhans[1]
[1]Division of Nuclear Medicine, Cape Town, South Africa, [2]Node of Infection Imaging Stellenbosch University, Cape Town, South Africa

Biography:
Monique Friesslaar qualified as a Radiographer with a B.Sc in Nuclear Medicine Technology in 2017. She completed her community service year (2018) at Tygerberg Hospital and was appointed at the NuMeRI Node for Infection Imaging as a Radiographer since 2020 until present. She enrolled for her MSc in Nuclear Medicine in 2021 with the focus in Radiopharmacy.

The development of new PET (Positron Emission Tomography) radiopharmaceuticals based on gallium-68 is one of the fastest growing fields in medicine. The most exciting developments are [68Ga]Ga-DOTA-octreotide and [68Ga]Ga-PSMA-11, both small tumour receptor targeting peptides. The Ithemba LABS germanium-68 generator however provides an impure gallium-68 eluate that must be prepurified to remove metal impurities before it can be used during synthesis. This study looks retrospectively at data generated during production at the Western Cape Academic PET/CT Centre at Tygerberg Hospital. The data to be evaluated includes the values of the radioactive strength, purity, sterility and efficiency of 10 synthesis of each production methods. Both chemical and physical purification will be evaluated in the full study.

It was found that there is a statistical significant difference between the decay corrected yields obtained during manual synthesis with cationic purification compared to the gold standard automated synthesis. For gallium-68 based PSMA it was 95 ± 5% (automated cationic) vs 79 ± 7 (manual cationic) and for gallium-68 based DOTA-NOC it was 80 ± 4 and (automated cationic) vs 61 ± 3 (manual cationic). However, the final yield in radioactive dose was not statistically significant. For gallium-68 based PSMA it was 1110.6 ± 62 (automated cationic) vs 1160 ± 133 (manual cationic) and for gallium-68 based DOTA-NOC it was 1055 ± 53 and (automated cationic) vs 909 ± 77 (manual cationic).

Future objectives of this study will include evaluating the anionic purification methods as well as fractionated elution. Furthermore, operator exposure, time of synthesis and costs will also be evaluated - for both PSMA and DOTA-NOC. Finally, as an extension of the study, the data obtained can be translated in proposing kit vial synthesis methods incorporating all of the investigated prepurification methods.

130

VALIDATION STUDY ON HEIGHT PREDICTION METHODS COMPARED TO THE GOLD STANDARD IN THE TYGERBERG HOSPITAL SETTING

Miss Megan Lee[1], Miss Meaka Garland[1], Miss Chloe Morris[1], Miss Thandeka Sibanda[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
Megan Lee, Meaka Garland, Chloe Morris and Thandeka Sibanda are final year Dietetics students from the University of Stellenbosch. Coming from Johannesburg, Hermanus, Sommerset West and Zimbabwe, each have keen interests in Therapeutic Nutrition, to which they wish to positively contribute in order to better patient outcomes.

In clinical nutrition, patients' accurate height measurements are crucial for determining body mass index, nutritional requirements and malnutrition risk. However, many patients with severe disease or are unconscious or immobile are exempt from the gold standard method of measuring height: the stadiometer.

This validation study aimed to compare the results obtained from measuring height with a stadiometer to alternative height prediction methods. All measurements were performed, using standardised methods, on 303 adult participants (56.8% female; 53.5% mixed race; 38.3% black; 7.3% white) at Tygerberg Hospital, South Africa. Bland-Altman plots and appropriate inferential statistics were performed.

Clinically insignificant differences in height compared to the gold standard were only observed for demi-span (1.63cm) and knee height (1,03cm). Age had a moderate positive correlation to knee-height ($r=0.436$, $p<0.01$). Gender showed statistically significant differences for arm span ($p=0.03$), demi-span ($p=0.02$) and knee height ($p<0.001$). Ethnicity was a statistically significant factor in the differences in height, therefore strengthening the argument that height prediction equations should be race-specific.

These results indicate that a single perfect height prediction method cannot be validated for the South African hospital population, using current regression equations. However, by determining the degree of accuracy between the gold standard and alternative height prediction methods, it provides insight on the order of best use in males and females, which can deliver improved patient management. Further investigation is required to create population and gender specific equations for standardised height prediction methods.

7

Supporting undergraduate research capacity development: a process evaluation of an Undergraduate Research Office at a South African Faculty of Medicine and Health Sciences

Dr Debbie Marais[1], Prof Nico C Gey van Pittius[2]

[1]*Undergraduate Research Office, Research Development & Support Division, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa,* [2]*Dean's Division, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa*

Biography:

Dr Debbie Marais is head of the Undergraduate Research Office at the Faculty of Medicine and Health Sciences. She provides support (training & resources) to students on how to do research, coordinates funding for research project and related expenses, and assists with ethics review of undergraduate and honours student projects. She is also a practising psychologist and conducts research related to mental health.

Background: University-based research capacity development (RCD) mechanisms tend to focus on staff and postgraduate students, with few structures targeted at undergraduate students. Support for undergraduate research must be tailored to the unique requirements of research at this level, while maintaining links with relevant structures in both the RCD and teaching and learning domains.

Objective: Conduct a process evaluation of the Undergraduate Research Office (URO) in the Faculty of Medicine and Health Sciences at Stellenbosch University, using RCD and Characteristics of Excellence in Undergraduate Research criteria as benchmarks.

Methods: A process evaluation of URO's first six years was conducted using a logic model of URO's inputs, activities, and outputs. Through a retrospective document review, a descriptive analysis of URO's inputs and activities (narrative) and URO's outputs (statistical) was conducted.

Results: Following a description of inputs and activities, results present URO's outputs as a measure of the uptake of these activities. From 2015-2020, 259 undergraduate research projects were completed. Research consultations, workshops, and undergraduate presentations at the Faculty's Annual Academic Day, have more than doubled since URO's inception. The Undergraduate Research Ethics Committee has reviewed 243 ethics applications since 2015, with a 1–2-week turnaround time. A total of 134 funding applications worth R705,986 have been awarded for research project, conference presentation, and publication costs.

Conclusion: Results show the potential impact of a formal undergraduate research support entity on the undergraduate research outputs of a Faculty of Medicine and Health Sciences. This paper highlights elements for success for formal undergraduate research support and identifies gaps going forward.

250

The use of D-Dimer assay to exclude left atrial thrombus in patients undergoing cardioversion of atrial fibrillation/flutter or interventions via the left atrium.

Mr Thabang Monakalali[1,4], Prof Anton Doubell[2], Mr Manie Hanekom[3], Mr Kumeshin Moodley[2], Mr Jan Steyn[4], Dr Jane Moses[2]

[1]Central University of Technology, Free State, Bloemfontein, South Africa, [2]Division of Cardiology, Department of Medicine, Stellenbosch University, Tygerberg Hospital, Cape Town, South Africa, [3]Department of Cardiothoracic Surgery, University of the Free State, Bloemfontein, South Africa, [4]Division of Cardiology, Department of Medicine, Tygerberg Hospital, Cape Town, South Africa

Biography:

I am a student cardiac physiologist training in the division of cardiology at Tygerberg hospital. I am a final year student at the Central University of Technology, Free State.

Background: Patients with arrhythmias such as atrial fibrillation/flutter (AF/AFL), or structural heart disease such as mitral stenosis are at risk of left atrial thrombus (LAT) formation. This risk for thromboembolism is especially high in peri-procedural circumstances such as cardioversion, or with catheter manipulation in the left atrium (LA) in procedures such mitral balloon valvuloplasty or AF ablation. To limit the risks of thromboembolism, all these patients undergo transoesophageal echocardiography (TOE) prior to these procedures.

Objectives: The objective was to assess the utility of the D-Dimer assay as a surrogate to detect or exclude LAT prior to cardioversion or LA interventions.

Methodology: After ethics and institutional approval, informed consent was obtained from consecutive patients presenting for TOE from 02/1212021 to 09/06/2022. Blood samples for D-dimer levels were collected within 48 hours of the TOE procedure.

Results: Thirty-two patients were recruited prospectively. The mean age was 53 years (range 24 – 77). Eleven (31%) of these patients were male. The patients had a high thrombo-embolic risk with a mean CHA2DS2-VASc score of 3.25. Two patients had LAT, both with elevated D-dimer levels (mean of 0.61 mg/L). Of the 30 patients without clot, spontaneous LA echo contrast (LASEC) was present in 5 individuals. These 5 patients had a mean D-dimer level of 0.41 mg/L. The remaining patients had clear LA with a mean D-dimer level of 0.39 mg/L. No patient with a normal D-dimer level (< 0,25 mg/L; n=19) had LASEC or LAT present.

Conclusions: In this small cohort, elevated D-dimer levels alone were not able to distinguish patients with or without LAT. However, the absence of LAT and LASEC in patients with D-dimer levels < 0.25 mg/L suggests that the negative predictive value of this finding should be explored with a larger cohort.

88

Social Media and Electronic Communication usage by South African Dietitians

Miss Deena Shaulov[1], Miss Kirstin Allies[2], Miss Bronwyn Grey[3], Miss Katlego Kgoedi[4], Miss Henrike Uys[5], Mr Uzayr Moerat[6]

[1]Stellenbosch University, Cape Town , South Africa, [2]Kirstin Allies , Cape Town , South Africa , [3]Bronwyn Grey , Cape Town , South Africa, [4]Katlego Kgoedi , Cape Town , South Africa , [5]Henrike Uys, Cape Town , South Africa, [6]Uzayr Moerat , Cape Town , South Africa

Biography:
Final year dietetic students

An increasing number of dietitians are utilising social media platforms and electronic communication tools to enhance professional networking and to provide accurate nutritional information to both the public and healthcare sector.

This study aimed to determine the extent of the use of social media and electronic communication by South African dietitians, and to investigate selected digital platforms hosted by dietitians in terms of adherence to relevant guidelines and regulations, particularly those of the Health Professions Council of South Africa (HPCSA).

Dietitians were included in this cross-sectional descriptive study, collecting data by means of an online survey (N=125) and observational checklist (N=135). Both parts assessed demographic characteristics, content and awareness, or adherence to ethical guidelines of dietitians' digital platforms.

Most participants used Instagram (n=45, 45.9%) and Facebook (n=31, 31.6%) as these platforms are user friendly, quick and suitable to their target audiences. The Covid-19 pandemic caused an increase in social media usage amongst dietitians (n=54, 65.1%). Barriers to social media usage included not having enough time (n=44, 28.8%) and being unfamiliar with some platforms (n=31, 20.3%). Enablers to social media usage included better reachability of platforms to their target audience (n=51, 20.2%) and ease of use of some platforms (n=47,18.6%). The majority of survey participants were aware of HPCSA social media guidelines (90.7%, n=68). Thirty-four (25.2%) of the platforms observed engaged in forms of touting/canvassing. Twenty one dietitians sold products on their websites (15.6%), with the most commonly sold products being meal plans (n=7, 5.2%) followed by supplements (n=5, 3.7%).

This study has shown that South African dietitians actively engage with digital platforms to a varied extent, highlighting the importance of being cognizant of, and applying the HPCSA Ethical guidelines for Good Practice. The study can be useful in guiding future research on this unexplored, emerging topic.

185

Development of a secure data sharing platform for whole genome sequencing using point-of-care DNA testing as an internal control measure.

Development Of A Secure Data Sharing Platform For Whole Genome Sequencing Using Point-of-care Dna Testing As An Internal Control Measure Marvin Theys[1], Prof. Maritha Kotze[6], Mr. Duncan Robertson[1,2], Mr. Craig Kinnear[3,4], Mr. Patrick Charls[5]

[1]Stellenbosch University, Kraaifontein, South Africa, [2]Division of Bioinformatics and Computational Biology, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]South African Medical Research Council Genomics Centre, Cape Town, South Africa, [4]DSI-NRF Centre of Excellence for Biomedical Tuberculosis Research, South African Medical Research Council Centre for Tuberculosis Research, Division of Molecular Biology and Human Genetics, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [5]Information Technology Services Division, South African Medical Research Council, Cape Town, South Africa, [6]Division of Chemical Pathology, Department of Pathology, National Health Laboratory Service, Tygerberg Hospital, Cape Town, South Africa

Biography:

I have completed my Master's at CPUT and am currently enrolled for a PhD at Stellenbosch University. My masters thesis was based on the POPI Act and its impact on SME's within a specific industry. The intended PhD study will be similar but will be conducted in the medical sciences space.

Introduction: The challenges associated with processing of large quantities of genomic data between laboratories were recently highlighted when a mismatch was detected between our internal control DNA panel and genome-scale sequencing data from the same individual. This finding identified the need for an information technology (IT) system extending from rapid point of care (PoC) DNA screening tests to whole exome/genome sequencing (WES/WGS).

Aim: To develop an effective data sharing platform supported by a dynamic informed consent process with the necessary protection of personal information processed from PoC screening to WGS.

Methods: For the development of the laboratory IT system, compliance with legislation for medical information and personal data was assessed. This involved evaluation of the storage, transfer, access and processing of data to extract clinically meaningful WGS information. For this purpose, a pathology-supported genetic testing (PSGT) platform was established at the intersection of participating laboratories and clinical practice.

Results: Investigation of various hardware and software options such as device security and encryption resulted in an optimal solution employed for secure data sharing as required for the implementation of personalized genomic medicine. WGS data was directly uploaded from the laboratory to a secure FTP server hosted by the SAMRC. The data was then transferred internally to a High Performance Computing Cluster, where bioinformatics analysis was performed remotely via a secure SSH connection. Implementation of PoC DNA testing at the start of the WGS laboratory workflow ensured data integrity by preventing data mix-up from sample collection to WGS bioinformatics analysis and variant classification.

Conclusions: The clinically enriched WGS database developed in parallel to infrastructure building facilitates the translation of fragmented medical, lifestyle and genetic data into adaptable patient reports. Return of research results to eligible patients are underpinned by a data sharing agreement, a data access committee, and genetic counselling support.

168

EVALUATING STUDENTS' KNOWLEDGE, SKILLS AND ATTITUDES WHEN TAKING PATIENT SEXUAL HISTORIES AT A SOUTH AFRICAN UNIVERSITY: A GUIDE FOR CURRICULUM DEVELOPMENT.

Dr Heidi Van Deventer[1], Prof MW Ross[2], Dr Jantien Thomson[1], Dr Marlena Du Toit[1], Dr Mieke Poelsma[1], Dr Marie Pienaar[1], Prof Andre Van der Merwe[1], Prof MH Botha[1]
[1]Stellenbosch University, Tygerberg, South Africa, [2]University of Minnesota, Minneapolis, United States of America

Biography:
Dr Heidi van Deventer is a senior medical officer and researcher at the Division of Urology, Stellenbosch University. She is part of the task team developing the sexology curriculum for the first-year medical students. Her main interests are Sexual Health, Sexual Medicine and research.

Introduction
The Faculty of Medicine and Health Sciences (FHMS) developed a sexology curriculum that has been included in the new medical curriculum of 2022. The aim of the study was to use the Sexual Health Education for Professionals Scale (SHEPS) to gather baseline data from the students before the introduction of the sexology curriculum.
Methods
This descriptive and cross-sectional study included all the first-year medical students (n=289) of the FHMS, Stellenbosch University, South Africa. The SHEPS was answered online, before the start of the sexology curriculum. The SHEPS has four sections: knowledge, skills, attitudes and demographics. The first three sections are answered with a Likert-type scale. For the knowledge and communication sections, students had to describe their level of confidence in their knowledge or communication skills, respectively, to care for patients when discussing sexuality and sexuality related topics with regards to clinical scenarios. The attitude section measured the students' level of agreement or disagreement on sexuality related opinion statements.
Results
Completed questionnaires were 281/289 (response rate 97%). The majority of students are female (75%) and 55% of the class were first taught about sexuality in the age group 13-18 years. The students had more confidence in their communication skills, compared to knowledge, even though they have not yet received any formal training in either of these. The attitude section revealed that there are students on both ends of the scale – ranging from an attitude more accepting of sexual behaviour and variety to more set standards about sexual conduct.
Conclusion
This is the first time that the SHEPS has been used in a South African context. The results provide useful information about the range of sexual health knowledge, skills and attitudes of students, which will guide further curriculum development, for our institution as well as the rest of South Africa.

211

Media content analysis on the extent and nature of coverage given to the Competition Commission Covid- 19 block exemption into healthcare

Amina Abdullah[1], Thatohatsi Sefuthi[1], Mapato Ramokgopa[1], Sharon Fonn[2], Lungiswa Nkonki[1]
[1]Department of Global Health, Division of Health Systems and Public Health, Stellenbosch University, Cape Town, South Africa, [2]School of Public Health, University of the Witwatersrand, Johannesburg, South Africa

Biography:
Amina Abdullah, second year MPhil Health Systems and Services candidate. She is on her academic journey of enhancing the health of the South African population through research and advocacy for health care reform and to play a more active role in delivering health care and services in response to the health needs of our communities.
Born and Bred in South Africa.

Response to COVID-19 pandemic required coordinated and intersectoral action. One of the coordinated actions taken by the South African government was on competition policy. In response, the South African Competition Commission on 19th March 2020 published a Covid-19 block exemption for healthcare to promote standardization of practices across the South African health sector and facilitate agreements between the National Department of Health and private sector to ensure adequate service delivery to all South Africans. The Covid-19 block exemption into healthcare was aimed at strengthening the health system's response and consequently improve the public health response to the pandemic.

The media is important for raising and communicating policy issues. Media coverage gives status to issues, influencing the public's opinion of their importance. Given the importance of the media in shaping public discourse and communication, we assessed how much coverage the block exemption for healthcare received in the media and if the coverage included any details of what the exemption means, how it can be used, and how it may have influenced public sentiment.

We conducted a qualitative content analysis. Our search yielded 8877 hits over a period of 1 year (19 March 2020 – 19 March 2021), of which 22 met the inclusion criteria. Findings suggests that the block exemption was indeed communicated through varying media platforms which resulted in a reach of 432 003 of the public. Most publications convey what the exemption means but rarely descriptive of how it can be used, and 20 of the included articles received a positive sentiment from the public.

To the best of our knowledge, this is the first study of its kind to systematically examine media reporting on the relaxation of competition policy to aid universal coverage of the health system response to the COVID-19 pandemic.

Theme 8 - Mental Health and Neurosciences / Tema 8 – Geestesgesondheid en Neurowetenskappe

111

Investigation into the Trace Aminergic System as a Female-Biased Pathway involved in Anxiety Disorders

Mr Aidan Balshaw[1]
[1]*Stellenbosch University, City of Cape Town, Belville, South Africa*

Biography:
My current thesis project focuses on anxiety disorders where I hope to further my knowledge of dysfunctional neurotransmission and receptor signalling, as well as learn new skills in order to overcome the significant challenges in pharmacotherapy for neuropsychiatric diseases. I am driven by the current issues encountered in healthcare and inspired by the thoughtful, quality work being done by those around me.
After completing my Honours degree in the Division of Clinical Pharmacology at Stellenbosch University's Faculty of Medicine and Health Science, my interest in neurological and psychiatric disease lead me to pursue my Masters degree in Clinical Pharmacology.

Given that anxiety disorders, the most common class of psychiatric disorders, are approximately twice as prevalent in females than in males and the increases in anxiety symptoms at specific phases in the menstrual cycle, the role of ovarian hormones has been implicated in anxiety disorders. Preclinical models of anxiety implicate low estradiol levels in the late luteal/ early follicular phase and estrogen receptor-beta (ERβ) in the symptomatic exacerbations of anxiety.

The role of the microbiome-gut-brain axis on anxiety-like behaviour has been shown through multiple lines of evidence. Given the involvement of endogenous neurotransmitters in mediating the signalling in the microbiome-gut-brain axis, a promising group of neuromodulators, trace amines, which modulate serotonergic, dopaminergic and glutamatergic neurotransmission, are posed at both the CNS and the small intestines to modulate endogenous MGB axis neurotransmission in various psychiatric diseases. Furthermore, changes in estradiol concentrations have been demonstrated to alter microbial trace amine production without affecting microbial growth in addition to alterations in trace amine-induced cytotoxicity and inflammation in HT-29 cells. These results suggest the potential of trace amines in IBS and anxiety in light of the female bias in both IBS and anxiety, with menstrual cycle-related changes in gastrointestinal symptoms and anxiety-like behaviour.

As a result of the lack of biomarkers associated with anxiety disorder, preclinical studies are important sources of information for anxiety-like behaviour. Zebrafish larvae will be used as a model organism to assess light/dark anxiety behaviour in this study through which the effect of both estradiol and relevant trace amines on anxiety-like behaviour will be assessed. In addition, the potential mechanism of the trace amine showing the greatest anxiolytic potential will be assessed in serotonergic, glutamatergic and nitrergic neurons in both the brain and gastrointestinal tissue by means of immunohistochemistry as well as behavioural analysis.

131

A clinician monitored 'PTSD Coach' intervention: Findings from two pilot feasibility and acceptability studies in a resource-constrained setting.

Mrs Erine Brocker[1], Professor Soraya Seedat[1], Dr Sharain Suliman[1], Prof Miranda Olff[2]
[1]*Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, South Africa,*
[2]*Department of Psychiatry, Academic Medical Centre, University of Amsterdam, Amsterdam, The Netherlands*

Biography:
Erine Bröcker is a clinical psychologist researcher and Ph.D. candidate at the Department of Psychiatry, Stellenbosch University (SU). Her fields of interest include trauma and stress-related conditions, digital mental health interventions and neuromodulation. Under the guidance of Dr van den Heuvel, Erine forms part of the core clinical team of the TMS Service at SU where she is responsible for the administration of the treatment and liaison between referring clinicians and patients.

Background: The high prevalence of trauma exposure and consequent posttraumatic stress disorder (PTSD) are well documented in low- and middle-income countries and most individuals with PTSD have limited access to needed treatments in these settings. Freely available internet-based interventions, such as PTSD Coach (web-based and mobile application), can help address this gap and improve access to and efficiency of care. We conducted two pilot studies to evaluate the feasibility, acceptability, and preliminary effectiveness of PTSD Coach in a South African resource-constrained context. Methodology: Pilot 1: Participants with PTSD (n=10) were randomised to counsellor-supported PTSD Coach Online (PCO) or enhanced treatment-as-usual. Pilot 2: Participants (n=10) were randomised to counsellor supported PTSD Coach Mobile App or self-managed PTSD Coach Mobile App. Feasibility and acceptability were assessed by comparing attrition rates (loss to follow-up), reviewing participant and counsellor feedback contained in fieldnotes, and analysing data on the 'Perceived helpfulness of the PTSD Coach App' (Pilot 2). PTSD symptom severity was assessed with the Clinical Administered PTSD Scale (CAPS-5) changes between treatment and control groups were compared, reliable change index calculated, and clinically significant change determined. Results: In Pilot 1 three participants were lost to follow-up, and two participants were lost to follow-up in Pilot 2. Fieldnotes indicated that PTSD Coach Mobile App addressed identified computer literacy challenges in Pilot 1 (PCO); and a shorter duration of intervention (from eight to four weeks) was associated with less attrition. In Pilot 1 the RCI indicated that four participants experienced significant improvement in PTSD symptom severity, while eight indicated significant improvement in PTSD symptom severity in Pilot 2. Conclusion: Preliminary results suggest that both platforms can alleviate PTSD symptoms, and that the involvement of volunteer counsellors is beneficial. PTSD Coach Mobile App may be more feasible than the online version (PCO) in our setting.

212

Evaluating the performance of polygenic risk score- and machine learning-based classification for the prediction of PTSD in a South African population

Mr Morne Du Plessis[1,2], Dr Leigh van den Heuvel[1,2], Professor Soraya Seedat[1,2], Professor Sian Hemmings[1,2]
[1]Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]South African Medical Research Council / Stellenbosch University Genomics of Brain Disorders Research Unit, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa

Biography:
Morne Du Plessis is a PhD student using polygenic risk score- and machine learning-based modelling approaches to identify the optimal method through which to predict PTSD status in a South African population.

Posttraumatic stress disorder (PTSD) is a complex psychiatric disorder characterised by symptoms of intrusive thoughts, avoidance behaviours, hyper-arousal and negative alterations in cognition and mood. PTSD is unique among psychiatric disorders in that its identification is conditional upon exposure to a traumatic incident. While 50-85% of individuals will encounter a traumatic event in their lifetime, the prevailing prevalence of PTSD lies approximately between 1.3 and 12.2%. This discrepancy serves to highlight the existence of factors granting individuals contingent resilience or vulnerability to developing PTSD. While the biological underpinnings elemental to PTSD remain largely unknown, prior heritability estimates have suggested that the disorder presents a genetic component that interacts with non-genetic factors to confer risk of or resilience to PTSD.

This study aims to elucidate the molecular mechanisms underlying PTSD by comparing the predictive performance of a series of PTSD-risk proxies in a uniquely admixed South African population. Polygenic risk score- and machine learning-based predictive approaches will be used to construct, optimize and subsequently validate models tailored to assess genetic risk. In addition, we will explore the utility of genetically supported predictor variables by utilising transcriptome analysis to test the generated risk proxies against potential molecular contributors.

Data will be presented on preliminary polygenic risk score models attempting to identify the optimal method to predict PTSD status in our sample population.

These findings will add to the growing knowledge base on polygenic risk score- and machine learning-based methods in psychiatric studies, supplement our current research on the genetic mechanisms underlying PTSD, as well as help improve existing analytical capabilities associated with interrogating complex datasets in resource-limited environments.

71

Abnormal cortical gyrification morphology in PTSD and association with symptom severity and metabolic parameters

Dr Jean-Paul Fouche[1,2], Dr Stefan du Plessis[1,2], Dr Leigh van den Heuvel[1,2], Mrs Chanelle Hendrikse[1,3], Prof Robin Emsley[1], Prof Soraya Seedat[1,2,4]

[1]Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]SAMRC Genomics of Brain Disorders Unit, Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [3]Department of Pediatrics and Child Health, University of Cape Town, Cape Town, South Africa, [4]SA Research Chairs Initiative in Posttraumatic Stress Disorder, Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

Biography:

Jean-Paul Fouche obtained his PhD (Neuroscience) from the University of Cape Town in 2018. He is currently working on a project investigating the brain imaging correlates of PTSD and metabolic syndrome in a South African population. In addition, he is also interested in determining the brain and epigenetic aging of various mental health disorders such as PTSD, depression, and anxiety.

Background: Cortical gyrification is an indication of the folding of gyri and sulci. Previous work demonstrated higher gyrification in regions of the parietal and occipital lobes in PTSD patients compared to trauma-exposed controls (TEC). The aim of this study was to investigate cortical gyrification in PTSD patients and further assess for any associations with PTSD symptom severity and metabolic parameters indicative of cardiovascular disease risk.

Methodology: 317 adult participants (n=160 with PTSD; n=147 TEC) from the "Shared Roots" study, conducted in Cape Town, South Africa, were included in the analysis. MRI data acquired on a Siemens 3T scanner underwent processing in Freesurfer to calculate the local gyrification index (LGI). Data were analysed with Freesurfer's QDEC application using general linear models to investigate group differences between PTSD and TEC, and associations with PTSD symptom severity and MetS status.

Results: There was a significant ($p < 0.05$) between-group difference in LGI in PTSD patients and TEC. Higher LGI was found in temporal and middle frontal regions for the PTSD group compared to TEC. In addition, there was a significant positive association of LGI and PTSD severity in the left frontal region and positive associations of MetS status in parietal, temporal and frontal regions. When controlling for MetS status as a covariate in the model, only the clusters in the left frontal region were signficant.

Conclusion: The results in this study are an indication that abnormal gyrification, ie. higher LGI in the frontal cortices, could be a neural marker for PTSD. In addition, abnormal gyrification of the prefrontal cortex seem to be associated with PTSD symptomatology, whereas gyrification in other more widespread regions of the brain seem to be associated with metabolic syndrome. Cortical gyrification could be a biological risk factor for PTSD, however longitudinal studies are needed to confirm this.

165

Understanding confounding factors in the zebrafish light-dark transition test

Michelle Gelderblom[1], Prof Carine Smith[1]
[1]*Stellenbosch University, Stellenbosch, South Africa*

Biography:
Michelle Gelderblom has a BSc in Human Life Sciences and a BSc Hons in Genetics from Stellenbosch University. She is currently an MSc Candidate in the Division of Clinical Pharmacology.

Background: The light-dark transition test is widely used to assess anxiety behaviour in zebrafish larvae. Although the popular protocol entails repeated light and dark cycles of 10 minutes each, the rationale for methodological choices is not clear. Furthermore, permutations of this protocol are often used, which may complicate the extrapolation or contextualisation of data generated using different protocols.

Aim: Therefore, this study aimed to investigate the effect of different experimental design choices on the activity measured during the light/dark transition test (LDTT). Potential confounders investigated were the effect of age of larvae, light intensity, duration of light cycle, time of day and potential for habituation on repeated exposures.

Methods: Zebrafish larvae underwent the LDTT at different ages (2 dpf to 5 dpf), at different times of day (between 9:00 to 15:00), for different number of repeats and different light period lengths (1 min and 10 min). Their total distance moved during the dark period was compared using ANOVA or the Kruskal-Wallis test to determine whether there was a significant effect on the response to light/dark transitions.

Results: Age, time of day and duration of the light period had a significant effect on the response to the LDTT ($p<0.001$). Repeated cycles did not significantly affect the increase in activity during the dark period. The intensity of illumination during the light period does not appear to have an effect on LDTT response at the high light intensities used, but further experiments exploring lower light intensities are recommended.

Conclusion: Current data highlights the importance of considering these factors when comparing results across studies, and suggests that parameters can be altered to optimise screening for different types of effects, including anxiolytic and anxiogenic effects.

8

Childhood trauma exposure and reward processing in healthy adults: A functional neuroimaging study

Mrs Chanellé Hendrikse[1], Dr Stefan du Plessis[1,2], Dr Hilmar Luckhoff[1], Prof Matthijs Vink[3], Dr Leigh Luella van den Heuvel[1,2], Dr Freda Scheffler[1], Dr Lebogang Phahladira[1], Mrs Retha Smit[1], Prof Laila Asmal[1], Prof Soraya Seedat[1,2], Prof Robin Emsley[1]

[1]Department of Psychiatry, Stellenbosch University, Cape Town, South Africa, [2]Genomics of Brain Disorders Research Unit, South African Medical Research Council / Stellenbosch University, Cape Town, South Africa, [3]Departments of Experimental and Developmental Psychology, Utrecht University, Utrecht, Netherlands

Biography:

Chanellé Hendrikse is an academic researcher working in the fields of brain imaging and psychiatry. She holds a master's degree in Psychology (Research) and has been working as a neuroimaging research assistant for the past six years. She is also a third-year PhD in Psychiatry student, investigating the associations between childhood trauma exposure and brain structure, function, and network architecture in adulthood.

The association between childhood trauma exposure and risk of developing psychopathology may in part be mediated by the effects of chronic stress on dopaminergic neurotransmission. However, little is known about the differential effects of distinct trauma types on reward processing, particularly in adults without concurrent medical or psychiatric disorders. We examined the association of childhood trauma exposure, including the differential effects of abuse and neglect, with reward processing in healthy adults (n = 114). Functional magnetic resonance imaging during a monetary incentive delay task was used to assess neural activity in the ventral striatum and orbitofrontal cortex in relation to reward anticipation and reward outcome, respectively. Exposure to childhood trauma, including abuse and neglect, was assessed using the Childhood Trauma Questionnaire-Short Form. We found a significant effect for abuse on ventral striatal activation during reward anticipation, adjusting for age, sex, scanner site, educational level, and household monthly income. There were no effects for abuse or neglect, independently or combined, on orbitofrontal cortex activation during reward outcome. Our findings suggest differential effects of childhood abuse on ventral striatum activation during reward anticipation in healthy adults.

174

Development of liquid chromatography tandem mass spectrometry (LC-MS/MS) methods for extraction and quantification of trace amine profile in rat urine and brain tissue

Miss Natasha Henning[1], Dr Tracy Kellermann[1], Prof Carine Smith[1]
[1]*Division of Clinical Pharmacology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University , Cape Town, South Africa*

Biography:
Second year MSc candidate in the division of clinical pharmacology. Completed BSc Human Life Sciences undergraduate degree followed by a BSc Honours in Pharmacology at Stellenbosch University.

Background: Trace amines are endogenous biogenic amines present in trace amounts often nano or picomolar concentrations. The trace aminergic system is becoming increasingly relevant to diseases that are commonly diagnosed but poorly understood. Popular research focus areas linked to trace amine involvement are neuropsychiatric, neurological, and gastrointestinal disorders. Trace amine related research is limited by the relative lack of sensitive analytical methods for their quantification in different body compartments.

Methods: A solid phase extraction (SPE) protocol was developed utilizing Supel-clean™ LC-WCX SPE cartridges with 100 mg bed wt. and 1 cc barrel. LC-MS/MS analysis was conducted using a Shimadzu 8040 triple quadrupole LC-MS. Chromatographic separation was performed on an Agilent Poroshell 120 EC-C18 2.7 µm; 3.0 x 100 mm column. Analysis of the trace amine panel including, β-phenylethylamine (PEA), tyramine (TYR), tryptamine (TRP), agmatine (AGM), putrescine (PUT) and 3-iodothyronamine (T1AM) was performed using two gradient elution programs and two different mobile phase systems. Calibration curves were prepared in a blank solvent due to the presence of endogenous levels of trace amines in the brain and urine.

Results: The calibration range for PEA ranged from 0.980 – 1000 ng/mL, for TYR and TRP from 1.950 – 1000 ng/mL, for AGM from 3.900 – 1 000 ng/mL and for PUT and T1AM from 15.63 – 1000 ng/mL. The correlation coefficient (r) was greater than 0.990 for all analytes. The mean recovery of trace amines for the brain was between 57.48 and 110.7 % and 55.76 and 105.7 % for urine.

Conclusion: Current data validates our methods for application to rodent urine and brain tissue, for extraction and quantification of trace amines. Data also highlights the need for trace amine-specific optimization of analytical protocol.

49

Identifying microRNA species associated with anxiety proneness in South African adolescents

Miss Danielle Jansen Van Rensburg[1], Dr Patricia C Swart[2,3], Dr Jacqueline Samantha Womersley[2,3], Prof Soraya Seedat[2,3], Prof Sian Megan Joanna Hemmings[2,3]

[1]Division of Molecular Biology and Human Genetics, Department of Biomedical Science, Faculty of Medicine and Health Science, Stellenbosch University , Tygerberg, South Africa, [2]Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University , Tygerberg, South Africa, [3]SU/SAMRC Genomics of Brain Disorders Unit, Stellenbosch University, Tygerberg, South Africa

Biography:

Daniélle Jansen van Rensburg is an MSc student whose research investigates the association between microRNAs in blood and anxiety proneness in a cohort of South African adolescents with exposure to childhood trauma.

LinkedIn: https://www.linkedin.com/in/danielle-jansen-van-rensburg-273b93230

Research Gate: https://www.researchgate.net/profile/Danielle-Jansen-Van-Rensburg

BACKGROUND/AIM

Anxiety proneness (AP) is the tendency to react fearfully to stressors due to the belief that they have harmful consequences. The biological mechanisms underlying AP remain unclear, although its aetiology includes both genetic and environmental factors. Epigenetic mechanisms, such as microRNAs (small, non-coding RNAs 19-20 nucleotides long), may explain how the combination of genetic variation and environmental risk factors (e.g., childhood trauma [CT]), can increase the risk of developing anxiety disorders. This cross-sectional study aims to investigate AP-associated differences in microRNA expression using whole blood obtained from South African adolescents with variable exposure to CT.

METHODOLOGY

Anxiety proneness was determined using the State-Trait Anxiety Inventory and Childhood Anxiety Sensitivity Index, to create a composite score reflecting trait anxiety and anxiety sensitivity, respectively. Childhood trauma exposure was determined using the Childhood Trauma Questionnaire. Total RNA (n = 87) was sent for microRNA-sequencing at the Centre for Proteomics and Genomics Research. DESeq2 will be used to identify microRNAs differentially expressed between AP groups. We will determine the effect of CT exposure on AP-associated microRNA expression using factorial analysis of variance.

RESULTS

The majority of adolescents were female (75.86%) with an average age of 15 (± 1.19) years. The proportion of participants by self-reported ancestry group differed significantly between the high-/low AP and high-/low CT groups (individuals who fell within the upper 66th (high) and lower 33rd (low) percentile on CT and AP measures; p=0.013), which will be corrected for during differential expression analysis. microRNA expression results will be presented.

CONCLUSION

This research will identify microRNA expression differences between high vs. low AP groups, and determine whether AP-associated microRNAs differ according to CT experience. This research will help to elucidate the

molecular mechanisms underlying AP in adolescence, a critical developmental period during which anxiety disorders are most likely to arise.

33

The association between pituitary adenylate-cyclase-activating polypeptide plasma levels and symptoms of post-traumatic stress disorder in a sample of rape-exposed women over 12 months

Lianna Kapp[1,2], Dr. Jani Nöthling[1,2,3], Prof. Naeemah Abrahams[3], Prof. Soraya Seedat[1,2], Prof. Sian Hemmings[1,2]
[1]Department of Psychiatry, Stellenbosch University, Cape Town, South Africa, [2]Genomics of Brain Disorders Research Unit, South African Medical Research Council/Stellenbosch University, Cape Town, South Africa, [3]Gender and Health Research Unit, South African Medical Research Council, Cape Town, South Africa

Biography:
Lianna Kapp completed her BSc (Molecular Biology & Biotechnology) in 2020 and BSc Honours (Genetics) in 2021 at Stellenbosch University. She joined the Neuropsychiatric Genetics Research Group for her MSc in January of 2022. Her MSc research project aims to investigate the relationship between PACAP plasma levels and methylation in relation to Post-Traumatic Stress Disorder status and symptom scores over time.

Rape is associated with a high risk of post-traumatic stress disorder (PTSD) compared to other trauma types. One biological mechanism mediating the interaction between rape exposure and PTSD risk is dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis. The adenylate cyclase-activating polypeptide 1 gene (ADCYAP1) and its protein product PACAP are master regulators of the HPA-axis and stress response. In an epigenome-wide analysis study (EWAS) we found that ADCYAP1 was differentially methylated in relation to PTSD status in the Rape Impact Cohort Evaluation (RICE) study. As a second step, we investigated changes in PACAP plasma levels in relation to PTSD symptom trajectories and status over 12 months. Increased PACAP levels have been associated with increased PTSD symptom severity in women.

In vitro quantitative PACAP plasma levels were investigated in a subset of 30 rape-exposed isiZulu speaking women residing in and around the eThekwini region of South Africa, using an enzyme-linked immunosorbent assay (ELISA). PTSD symptoms were measured using the Harvard Trauma Scale. PTSD symptom scores and PACAP levels were assessed at baseline (within 20 days post-rape), 3-, 6-, and 12-months post-rape. The data will be analysed using mixed regression models to investigate the covariance between PTSD symptoms and PACAP plasma levels over 12 months.

We will present findings related to PACAP plasma levels and PTSD symptom changes over time at the conference. We hypothesise that higher levels of PACAP plasma levels will be associated with higher PTSD symptom scores over time.

This study may contribute to understanding the role of PACAP and the HPA-axis in PTSD development and recovery. These findings may also provide support for PACAP as a potential therapeutic target and biomarker of PTSD pathogenesis.

58

Sexual dysfunction in first-episode schizophrenia spectrum disorders

Dr Hilmar Luckhoff[1], Prof Laila Asmal[1], Dr Stefan du Plessis[1], Sr Retha Smit[1], Dr Lebogang Phahladira[1], Prof Robin Emsley[1]

[1]*Department of Psychiatry, Stellenbosch University, Cape Town, South Africa*

Biography:

Dr. Hilmar Klaus Luckhoff is a research assistant at the Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University. He has a background in clinical medicine and biomedical research in pathology, mental health, and schizophrenia. His doctoral research focused on metabolic syndrome and outcomes in first-episode psychosis. He has a keen interest in sex- and gender-based research in schizophrenia.

Background: Sexual dysfunction (SD) is common in patients with first-episode schizophrenia spectrum disorders (FES).

Objective: To examine the prevalence and correlates of SD in a sample of patients with FES (n = 77).

Methods: Sexual functioning was examined using the Arizona Sexual Experiences Scale (ASEX). Clinical measures of interest included duration of untreated psychosis, psychopathology, depressive symptoms, level of functioning, and quality of life. Biochemical testing was also performed to measure prolactin, lipid profiles and fasting glucose levels.

Results: In total, 27 (35%) patients met the criteria for SD, which was significantly more prevalent in females compared to males (p = 0.027). Higher depression scores, poorer social and occupational functioning, and lower high-density lipoprotein cholesterol levels predicted overall SD. Female sex, more pronounced global psychopathology, and poorer quality of life were also predictors of domain-specific impairments in sexual functioning, adjusting for the extent of antipsychotic exposure.

Conclusions: SD has a high prevalence in patients with FES, particularly females. There is a need for a more nuanced understanding of SD in new-onset schizophrenia, and to establish its relevance in terms of comorbid depressive symptoms and poor quality of life. SD may require specific attention and tailored treatment in females with FES.

31

Genetic differences in the ADCYAP1, ADCYAP1R1 and BRSK2 genes in rape exposed women with and without PTSD

Mr Kabelo Mabokabe Simon Maloka[1,2], Prof Naeemah Abrahams[3], Prof Soraya Seedat[1,2], Dr Jani Nöthling[1,2,3], Prof Sian Megan Joanna Hemmings[1,2]

[1]Department of Psychiatry, Stellenbosch University, Cape Town, South Africa, [2]South African Medical Research Council/Stellenbosch University Genomics of Brain Disorders Research Unit, Stellenbosch University, Cape Town, South Africa, [3]Gender and Health Research Unit, South African Medical Research Council, Cape Town, South Africa

Biography:

Kabelo Maloka is a Masters student in the Department of Psychiatry at Stellenbosch University. He is part of the Neuropsychiatric Genetics research group. His Masters project is titled 'Genetic differences in the ADCYAP1, ADCYAP1R1 and BRSK2 genes in rape exposed women with and without PTSD.
He obtained his Honours degree from University of Limpopo in 2021.

Introduction: Rape and sexual assault are associated with a high risk for the development of post-traumatic stress disorder (PTSD) compared to other trauma types. Genetic differences in genes encoding components of the hypothalamic-pituitary-adrenal (HPA) axis, such as the adenylate cyclase activating polypeptide 1 (ADCYAP1) gene and its receptor 1 (ADCYAP1R1) potentially contribute to the risk of developing PTSD. Few studies have investigated the longitudinal course of PTSD following rape exposure and none, to our knowledge, have investigated genetic differences as predictors of PTSD symptom trajectory and risk post-rape. An epigenome-wide association study (EWAS) from the parent project found that ADCYAP1 (chr18:905177-905180) was differentially methylated in relation to PTSD in rape-exposed women (n=48) at 3-months post rape. As a second step, we will investigate ADCYAP1 and ADCYAP1R1 polymorphisms in relation to PTSD status and symptom scores over time.
Methods: Single nucleotide polymorphisms (SNPs) in ADCYAP1 (rs1893154, chr18:905124 and rs2856966, chr18:2856966) and ADCYAP1R1 (rs2267735, chr7:31095890) will be investigated using Kompetitive allele specific PCR (KASP) genotyping in women with (n=206) and without (n=248) PTSD (measured using the Harvard Trauma Scale) at 3-months post-rape. The SNPs will also be investigated in relation to PTSD symptoms at baseline (within 20 days of the rape), 3-, 6-, 9-, 12-, 18- and 24-months post-rape. The data will be analysed using mixed linear regression models.
Results: We will present findings related to the interaction between SNPs and PTSD status/symptom trajectory at a conference. We hypothesize that genetic differences in the ADCYAP1 and ADCYAP1R1 genes are potential mediators between rape-exposure and PTSD symptom trajectory over 24 months.
Conclusion: The findings may provide support for ADCYAP1 and ADCYAP1R1 as potential therapeutic targets and biomarkers of PTSD pathogenesis and course.

253

Experiences of Xhosa women providing kangaroomother care in a tertiary hospital in the Western Cape, South Africa

Dr Sibongile Mpongwana-ncetani[1], Dr Anusha Lachman, Dr Rizwana Roomaney
[1]*Psychiatry, Cape Town, South Africa*

Biography:

Dr Mpongwana-Ncetani is a registrar in psychiatry in her fourth year of study. She has special interests in women's mental health, child and adolescent health and public mental health. She is currently finishing up her registrar program with the university of Stellenbosch in Cape Town.

Kangaroo mother care (KMC) has been recognized as one of the interventions to improve preterm birth outcomes by the World Health Organization. KMC requires high user engagement and consists of continuous skin-to-skin contact between the mother and infant and exclusive breastfeeding. We conducted a qualitative study of Xhosa women (n=10) practising KMC in a tertiary hospital in the Western Cape, South Africa. All interviews were conducted in IsiXhosa, audio recorded, and transcribed. The transcribed data were analysed using thematic analysis. Four themes emerged: (1) KMC, a beneficial but foreign concept; (2) distress in the KMC ward; due to factors like poor milk supply, uncomfortable nursing positions and sleep deprivation; (3) the missing umbilical cord: experiences of mothers in the KMC ward reflecting on respect for cultural and traditional practices but having limited knowledge of its significance themselves; and (4) the KMC village: interpersonal relations in the ward that oscillates between staff and fellow patient mothers. Our study showed that cultural practices still pose a challenge to fully accepting KMC. We suggest more studies on cultural sensitivity to encourage acceptance of interventions that affect culturally diverse groups.

73

Characterisation of the gut microbiome associated with neuropsychiatric disorders in South African participants

Miss Michaela O'Hare[3], Dr Patricia C. Swart[1,2], Dr Stefanie Malan-Müller[1], Dr Yolandi Espach[1,2], Dr Leigh L. van den Heuvel[1,2], Mrs Erine Bröcker[1,2], Prof Soraya Seedat[1,2], Prof Sian M. J. Hemmings[1,2]

[1]Department of Psychiatry, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]South African Medical Research Council / Genomics of Brain Disorders Research Unit, Cape Town, South Africa, [3]Department of Biomedical Sciences, Division of Molecular Biology and Human Genetics, Faculty of Medicine & Health Sciences, Stellenbosch University, Cape Town, South Africa

Biography:

Michaela O'Hare is a first-year MSc student (Human Genetics) in the Neuropsychiatric Genetics Research Group in the Department of Biomedical Sciences at Stellenbosch University. She obtained a BSc (Human Life Sciences) in 2020 and BSc Hons (Genetics) in 2021 from Stellenbosch University. Her current MSc project forms part of the saNeuroGut project and involves characterising the gut microbiome associated with common neuropsychiatric disorders (anxiety, depression and PTSD) in South African participants.

Neuropsychiatric disorders (NPDs) are chronic disorders that are among the most prevalent causes of global years lived with disability and global disability-adjusted life years. In South Africa, only a small proportion of patients who are diagnosed with NPDs have access to affordable and effective treatments. Understanding the underlying mechanisms of NPDs may aid in developing novel treatments. Recent research suggests that the gut microbiome can be altered by traumatic experiences and stress, and that it also plays a role in the development of NPDs. However, most of this research has been conducted in either animal models, or North American or European human populations. Therefore, as part of the saNeuroGut study, we aim to characterise the composition of the gut microbiome of South African individuals with self-reported symptoms of depression, anxiety and post-traumatic stress disorder (PTSD) compared to healthy controls. Participants completed online self-report questionnaires, which showed that 63 of 87 participants (72%) had mental health scores indicative of at least one NPD. Stool samples were self-collected using the OMNIgene GUT OMR-200 collection device, after which DNA extraction was performed using the QIAamp PowerFecal DNA kit. Microbial DNA from 87 participants (65 females, 22 males) between the ages of 18 and 68 years underwent sequencing of the hypervariable V4 region of the 16S ribosomal RNA gene using the Illumina MiSeq over 500 cycles (2x250 paired-end reads). Bioinformatic and statistical analyses using the DADA2 and PhyloSeq packages in R will be performed to determine differences in gut microbial composition between cases and controls. This study is the first of its kind in South Africa; results will provide insight into the relationship between the human gut microbiome and NPDs in a South African population, which may lay the foundation for studies on the gut microbiome as a future therapeutic target.

62

Stress-related disorders, the gut microbiome, and platelet-conveyed 5-hydroxytryptamine

Ms Carlien Rust[1,2], Dr Stefanie Malan-Muller[3,4], Prof Etheresia Pretorius[5], Prof Sian Hemmings[1,2]
[1]Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa, [2]South African Medical Research Council / Stellenbosch University Genomics of Brain Disorders Research Unit, Stellenbosch University, Cape Town, South Africa, [3]Department of Pharmacology and Toxicology, Faculty of Medicine, Universidad Complutense de Madrid, Madrid, Spain, [4]Biomedical Network Research Center of Mental Health (CIBERSAM), Institute of Health Carlos III, Madrid, Spain, [5]Department of Physiological Sciences, Faculty of Science, Stellenbosch University, Stellenbosch, South Africa

Biography:
The presenter is a first-year Ph.D. student studying the correlation between the blood and gut microbiome in three Neuropsychiatric disorders at the Department of Psychiatry, Stellenbosch University. She has a background in plant biotechnology, genetics, and microbiology. She did her BSc(Hons) and MSc at the Institute for Plant Biotechnology on Stellenbosch University's main campus.

Stress-related disorders, including major depressive disorders and anxiety disorders, are associated with endothelial dysfunction, increased inflammation, platelet hyperactivity, and serotonin dysregulation. The gut microbiota is responsible for 95% of serotonin production which is conveyed by platelets through the blood. Platelets are suggested to be the link between the inflammatory response and stress-related disorders. However, the link between stress-related disorders, gut microbiome, and platelets have not been reviewed.

The aim of this study was to review published articles using PubMed searches to elucidate a proposed pathway between stress-related disorders, gut microbiome, and platelets. We used the following terms as criteria for searches: “Stress-related disorders” OR “Depression” OR “PTSD” OR “Anxiety”; AND “Gut microbiome”; AND “Serotonin” OR “5-HT” OR “Tryptophan”; AND “Platelets” OR “Platelet indices”.

We identified 103 publications using the aforementioned search terms. Of these, 30 publications were found not to be suitable for review, as they themselves were reviews, however, they did broaden the publication search. Research articles excluded from the review did not fall within the scope of this review.

Alteration in microbial composition due to stress increases intestinal permeability which allows the translocation of microbial products known to trigger the release of pro-inflammatory cytokines, causing platelets to become hyperactive and secreting serotonin into the plasma. Consequently, increased serotonin in plasma induces the activation of indoleamine-2,3-dioxygenase (IDO1). IDO1 is involved in the tryptophan/kynurenine pathway, which subsequently reduces 5-HT levels in the brain. Moreover, higher levels of pro-inflammatory cytokine levels increase blood-brain-barrier permeability, allowing inflammatory mediators entry into the brain to cause inflammation. Inflammation is suggested as a key causative factor for stress-related disorders. Hence, microbiota-dependent effects significantly impact platelet function and consequently affect several downstream pathways, altering serotonin levels to contribute to inflammation. Platelets can thus be considered a link between gut dysbiosis, inflammation, and stress-related disorders.

61

Predictors of relapse other than treatment non-adherence in first-episode schizophrenia spectrum disorders: a 24-month follow-up study

Ms Retha Smit[1], Prof Robin Emsley[1], Dr Hilmar Luckhoff[1], Dr Lebogang Phahladira[1], Dr Stefan du Plessis[1], Prof Laila Asmal[1]

[1]*Stellenbosch University, Bellville, South Africa*

Biography:

Anna Margaretha Smit obtained her BA psychology and Honours in applied psychology degrees with distinctions at the University of South Africa in 2018. She also obtained her Master's degree in psychology at the University of Stellenbosch in 2019. She is employed as a researcher and study co-ordinator in schizophrenia research since 1996, Department of Psychiatry at Stellenbosch University. Her master's dissertation focussed on the aetiology of schizophrenia, childhood trauma in relation with premorbid functioning, prior to disease onset. She is currently registered for her PhD on predictors other than non-adherence to treatment of relapse in schizophrenia spectrum disorders.

Background: Relapse rates are very high in schizophrenia. However, little is known about the predictors of relapse other than treatment non-adherence. Here, we performed a comprehensive examination of neurodevelopmental, clinical, and biological factors associated with relapse in a sample of patients with first-episode schizophrenia spectrum disorders FES (n = 126) who received assured depot antipsychotic over 24 months.

Methodology: The patients were assessed using socio-demographic questionnaires and validated clinical instruments. The putative neurodevelopmental markers of interest were cognition, neurological soft signs, premorbid adjustment, schizophrenia patient history, childhood trauma, obstetric complications, and substance use. We also examined other clinical (e.g., duration of untreated psychosis, psychopathology), functional (e.g., quality of life) and metabolic (e.g., fasting glucose, lipid profiles) predictors of interest. Relapse was defined using the Csernansky criteria, a 25% increase from PANSS total baseline score or clinical deterioration with a change score of 6 or 7 on the CGI scale. Substance use was assessed based on collateral family interviews and urine toxicology. We used logistic regression analysis to identify predictors of relapse and Cox regression analysis for time to relapse.

Results: A higher number of positive urine toxicology tests was a significant predictor of relapse risk (Odds Ratio, 1.43; 95% Confidence Interval [CI]: 1.11–1.84; p = 0.006), adjusting for age, sex, highest level of education, and duration of untreated psychosis. We also found that poorer quality of social relationships was a significant predictor of a shorter time to relapse (Hazard Ratio, 0.85; 95% CI: 0.76–0.95; p = 0.003), adjusting for the same covariates.

Conclusion: Increased cannabis use frequency might represent an independent risk factor for relapse in patients with FES, even when treated adherence is assured. The association of poor social relationships with a shorter time to relapse suggests that quality of life is an important determinant of prognosis in FES.

142

Assessing the impact of paediatric atopic dermatitis on the mental health and quality of life of their caregiver at a tertiary hospital in Cape Town, South Africa

Dr Shwetha Suresh[1], Dr Anusha Lachman[1], Dr Susanna Kannenberg[1]
[1]*University Of Stellenbosch, Cape Town, South Africa*

Biography:
Im a 4th year Registrar in the Department of Psychiatry at the University of Stellenbosch.Very passionate about mental health and with a special interest in Child and Adolescent psychiatry.

Abstract
Background: Atopic dermatitis (AD) is a chronic and often debilitating illness for children but also has a significant effect on caregiver quality of life (QOL) and mental health.
Aim: To explore the relationship between AD in children on the QOL and the mental health of their caregivers.
Methods: We conducted a cross-sectional study of patients and their caregivers attending the Dermatology Clinic at Tygerberg Hospital in Cape Town, South Africa. Participants were recruited between February 2021 and August 2021.
Results: Most of the children in this study experienced mild AD symptoms. Almost 90% of the children had an identifiable trigger, with the most common triggers being an environmental temperature change (66.7%) and stress (57.4%). We noted a weak but significant correlation between QOL and AD severity ($r_s = 0.395$, $p = 0.003$) and a strong positive correlation between the caregivers' QOL and their mental health ($r_s = 0.650$, $p < 0.001$).
Conclusions: The use of uncomplicated and rapid screening tools for caregiver mental health and QOL should be implemented when treating patients with AD. Understanding the burden and allowing room for mitigation of these modifiable factors will play a large role in ensuring a better therapeutic outcome for those children with a chronic illness like AD.

Keywords: atopic dermatitis, eczema, quality of life, mental health, attachment, caregiver

151

Identifying genetic loci that are associated with a change in gene expression (eQTLs) in PTSD patients a South African cohort.

Dr Patricia Swart[1,2], Mr Morne Du Plessis[1,2], Prof Soraya Seedat[1,2], Prof Sian Hemmings[1,2]
[1]*Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa,* [2]*Stellenbosch University/South African Medical Research Council Genomics of Brain Disorders Unit, Cape Town, South Africa*

Biography:
Dr Swart has more than 8-years' experience in an academic research environment working on a variety of multifaceted projects, ranging from laboratory animal models to human genetic and microbiome studies. Experience includes planning and coordinating research activities, budget management, research publications, conference presentations, postgraduate supervision, laboratory work and data management and analysis. Recognized for being an organised, data-driven team player.

The molecular mechanism underlying the development of posttraumatic stress disorder (PTSD), following exposure to a traumatic event, are yet to be elucidated and understood. One way to investigate these molecular mechanisms is to combine genomic and transcriptomic data to identify expression quantitative trait loci (eQTLs). eQTLs are DNA sequence variants that can influence gene expression, in a local (cis-) or distal (trans-) manner, and subsequently impact cellular and system physiology which may contribute to a disease phenotype. This study aims to identify genetic loci associated with a change in gene expression in PTSD patients in a South African cohort in order to better understand the molecular mechanisms underlying PTSD.

Genome-wide genotype data and RNAseq data were obtained from 32 trauma-exposed controls and 35 PTSD patients of self-reported mixed-ancestry, as part of the SHARED ROOTS project. These data were quality controlled using PLINK1.9 and DESeq2, respectively. The resulting 108,937 SNPs (MAF > 10%) and 11,312 genes were used in Matrix eQTL in R to map potential eQTLs. Matrix eQTL constructs linear regression models between the expression level of each gene and all SNPs within (cis-eQTLs) and further than (trans-eQTLs) 1 Mb of that gene. Age, sex, smoking, RIN, metabolic syndrome, cell type composition (CD16 positive monocytes and neutrophils) and the first 5 principal components were included as covariates.

The preliminary analysis described has identified several putative cis- and trans-eQTLs. However, the findings need to be confirmed and contextualised within PTSD-related literature.

Here we will describe potential eQTLs which may provide insight into the molecular mechanisms underlying the development of PTSD. This analysis is the first of its kind in this study population and encourages further multi-omics approaches towards investigating psychiatric disorders in non-European samples.

Theme 9 – Primary Healthcare / Tema 9 – Primêre Gesondheidsorg

198

Investigating the relationship between angiographic measurements of coronary reperfusion and myocardial recovery in patients presenting with ST-elevation myocardial infarctions treated with a pharmaco-invasive strategy

Ghia Gelderbloem[1,2], Professor Anton Doubell[3], Mr Jan Steyn[3], Dr Lloyd Joubert[3], Dr Phillip Herbst[3], Hr Hermanus Hanekom[4]

[1]Department of Health Sciences, Faculty of Health and Environmental Sciences, Central University of Technology, Free State, South Africa, , South Africa, [2]Division of Cardiology, Tygerberg Hospital, Cape Town, South Africa, , , [3]Division of Cardiology, Department of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University and Tygerberg Hospital, Cape Town, South Africa, , , [4]Department of Cardiothoracic surgery, University of the Free State, Free State, South Africa, ,

Biography:

I am a Clinical Technology student currently completing my final year of work-integrated learning at Tygerberg Hospital's Cardiology division.

Background

The therapeutic goal in ST elevation myocardial infarction(STEMI) is rapid restoration of blood flow maximising myocardial viability. The pharmaco-invasive reperfusion strategy is an acceptable alternative in a population without rapid access to primary percutaneous coronary intervention(PCI). Thrombolysis in Myocardial Infarction(TIMI) flow and myocardial blush(MB) grade as angiographic measures of successful reperfusion, together with ECG findings and time to reperfusion have not been used to predict myocardial viability in a South African population.

Purpose

To determine the correlation between myocardial viability and angiographic measurements of coronary reperfusion, ECG evolution and time to reperfusion following pharmaco-invasive treatment of STEMI patients.

Methods

A retrospective study of thirty-two STEMI patients undergoing angiography and cardiac MRI for viability assessment was performed. Patients were assessed for success of thrombolysis, delays in treatment and ECG evolution using the last ECG prior to angiography. Angiographic assessment included TIMI scores and MB grades.

Results

Thirty-two STEMI patients were included in this study. 94% of patients had no viability on CMRI. The angiographic variables assessed showed no correlation with myocardial viability. Successful thrombolysis correlated with increased initial TIMI flow and MB grade, but not with viability. There was no correlation between delayed reperfusion and myocardial viability. Patients with an evolved infarct on ECG showed no correlation with myocardial viability, however they did show a correlation with microvascular obstruction.

Conclusion

This study demonstrated no correlation between angiographic markers of reperfusion and myocardial viability. Moreover, there was no correlation between time to reperfusion or perceived success of reperfusion prior to angiography and viability. There was, however, a correlation between evolved infarcts on ECG and microvascular obstruction. It appears patients were referred for MRI to confirm clinically presumed non-viability. For this reason, a prospective evaluation of the correlation between angiographic markers of reperfusion and viability in an all-comers STEMI cohort is required.

60

Iliac and Femoral Vessels: Dimensions and Tortuosity in a South African Sample

Ms Robyn Lunn-Collier[1], Ms Kerri Keet[1], Professor Karin Baatjes[2], Mr Leeroy Witbooi[3]
[1]Division of Clinical Anatomy, Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University , Cape Town, South Africa, [2]Division of Surgery, Faculty of Medicine and Health Sciences, Stellenbosch University , Cape Town, South Africa, [3]Division of Radiodiagnosis, Faculty of Medicine and Health Sciences, Stellenbosch University , Cape Town, South Africa

Biography:
Ms Robyn Lunn-Collier is a 2nd year Masters student in the Division of Clinical Anatomy. She has a keen interest in variations within anatomy and anatomical education.

Background:
Blood vessel dimensions and tortuosity are factors considered during procedural planning, to minimize the risk of vascular injury. Arterial morphology differs between the sexes and undergoes changes during the aging process During endovascular procedures, access to vascular pathways is often gained by accessing the common femoral artery. This study aimed to determine demographic-specific measures of the dimensions and tortuosity of the common iliac, external iliac, and common femoral arteries, in a South African sample.
Methodology:
A retrospective, cross-sectional study was conducted on a sample of 224 computed tomography angiograms, including male and female sex (aged 18-79), accessed from Tygerberg Hospital, Cape Town, South Africa. Arterial length and lumen diameter of the common iliac, external iliac, and common femoral arteries were measured. Tortuosity severity was assessed qualitatively by a visual estimation and allocation into a phenotypic category. Furthermore, tortuosity was quantitatively assessed using the Tortuosity Index, and Inflection Count Metric. All measurements were adjusted for estimated body height.
Results:
Preliminary results reveal that the length and lumen diameter of the common iliac, internal iliac, and common femoral arteries increase with the aging process in both males and females. Most notable increases were seen from 50 years of age. Individuals below the age of 40 years presented with vessels of absent or mild tortuosity, however as age increased, tortuosity became more severe. The most common tortuosity phenotypes were c- and s-shaped curves, with the external iliac artery presenting with the most severe tortuosity.
Conclusion:
The study concludes that vessel morphology is influenced by factors of sex and aging, with changes in vessel morphology becoming apparent after 40 years of age. Therefore, clinicians should conduct thorough pre-procedural screening on patients falling within this age range, to minimize the risk of complications associated with accessing the femoral and iliac vessel pathways.

23

Cervical cancer primary prevention knowledge and practices of women visiting Tygerberg Hospital, Cape Town, South Africa.

Ms Elana Marais[1]
[1]*Stellenbosch University, Cape Town, South Africa*

Biography:
MBChB VI student at Stellenbosch University.
First-time researcher.

The aim of this research was to determine what adult women visiting Tygerberg Hospital, Cape Town, know about the Human Papilloma Virus (HPV) and HPV vaccination in relation to the primary prevention of cervical cancer in South Africa. HPV vaccination practices were also investigated. This research aimed to identify existing knowledge gaps and thus assess the need of the implementation of education programmes in parallel with HPV vaccination programmes to improve vaccination practices.

This was a descriptive study that followed a cross-sectional quantitative study design. Data was gathered by distributing a previously-validated, self-administered, paper-based questionnaire among adult women at the obstetrics and gynaecology outpatient areas of Tygerberg Hospital. The average score for the knowledge questions were 63.4%±16.8%, which was low when compared with a similar study. With regards to practices, a high number of participants were willing to receive the vaccine and allow their daughters to receive the vaccine.

This study highlighted the study population's knowledge gaps on the basics of HPV and HPV vaccination. It is essential to address these knowledge gaps in order to increase understanding and decrease uncertainty, which will result in HPV vaccine uptake and thus decrease cervical cancer morbidity and mortality in the future.

More studies on cervical cancer prevention should be done in countries where cervical cancer is still one of the leading causes of death. Similar studies should also enquire about the women's sources of information to enable the effective implementation of education programmes.

216

First-line anti-tuberculosis drug-associated hepatic injury: potential benefit of N-acetyl-cysteine elucidated in larval zebrafish

Ms Khethiwe Motha[1], Prof Carine Smith[1], Dr Tracy Kellermann[1]
[1]*Stellenbosch University, Elukwatini, South Africa*

Biography:
Khethiwe Motha had always wanted to be in the health sciences as this meant that she would make a difference in people's lives. Khethiwe has attended primary school at Ebuhleni Primary school and progressed to study at Chief jerry high school where she passed her metric with flying colors. She went to further her studies at the University of Limpopo where she obtained her Bachelor of Science degree in Molecular and Life Sciences. She was accepted to do her honours in Clinical Pharmacology at Stellenbosch University and is now a current Clinical Pharmacology master's student at Stellenbosch University.

Abstract
Background: Tuberculosis (TB) is the second deadliest infectious disease worldwide. Of the first-line antituberculosis drugs, isoniazid, pyrazinamide and rifampicin are associated with drug-induced liver injury (DILI). It is hypothesized that N-acetyl-cysteine (NAC) is able to treat/prevent TB-therapy associated DILI since it is effective in treating acetaminophen (APAP) associated liver toxicity. New models are needed for predicting DILI in humans. The transparency of the zebrafish (ZF) larvae makes it a suitable model for studying DILI using Oil Red O to indicate liver injury. This study aims to develop a zebrafish larval model for TB-therapy associated DILI and to investigate whether NAC can be used as an intervention, using APAP as a positive control.
Methods: Solubility and stability assessments of the first-line antituberculosis drugs and APAP were performed in E3 ZF media. Thereafter, dose response experiments were performed for all drugs to obtain maximum tolerated dose for use in the study using Oil red O liver stains and EthoVision movement tracking software (for NAC) as endpoints. These doses were optimized to compare liver injury from TB drug groups to the APAP control group. NAC was evaluated for capacity to treat/prevent TB-DILI.
Results: Acetaminophen, isoniazid, pyrazinamide and ethambutol were found to be soluble in embryo media and stable at 28˚C for 3 days. However, to obtain suitable stability and solubility for rifampicin, addition of ascorbic acid was required. DILI-associated doses were determined for all drugs assessed. Data will be presented on the capacity of NAC to prevent DILI in zebrafish larvae.
Conclusion: A time efficient, economical ZF larval model for DILI was successfully developed. Current data illustrates that this model is able to accurately simulate known toxicity effects of first-line antituberculosis drugs on the liver. Furthermore, this model can be used to evaluate potential of preventative strategies in this context.