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ABSTRACTS / ABSTRAKTE

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Theme 1 / Tema 1

Health Systems Strengthening/ Gesondheidsisteme Versterking

ORAL PRESENTATIONS / REFERATE

ABSTRACT NUMBER / ABSTRAKNOMMER: 1

A scoping review of interventions to improve data quality and use in health systems in South Africa

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BACKGROUND Information is the foundation of a health system and informs decision making. The use of poor quality data can lead to wrong decisions being made and non-use of information by decision makers.OBJECTIVETo identify specific interventions to improve data quality and use which will result in informed decision being made in the health system.METHODSA scoping review of published and unpublished English literature using the following key terms was conducted from electronic data bases over a 15 year period: “data quality”, “data quality improvement”, “data quality improvement techniques OR strategies”, “quality information”, information”, “use of data”, “data for decision-making” and “data for management”. The articles were limited to hospital and public health settings. The articles were identified by two reviewers with a third reviewer resolving discrepancies. The total number of 194 articles were included in the study.RESULTSTo improve data quality and use the following interventions are recommended: (1) training, capacity development, mentoring and coaching in data management process; (2) effective use of technology; (3) data quality audits, ongoing data quality assessments, and quality checks with corrective action; and (4) standardisation of procedures, practices, tools and systems.CONCLUSIONVarious interventions for improvement of data quality and use of information have worked effectively in South Africa and can be applied in other public health facilities.

ABSTRACT NUMBER / ABSTRAKNOMMER: 2

An investigation of evidence based fall prevention strategies as implemented in old age homes in the Breede Valley Municipality

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Falls among the elderly have extensive cost implications in terms of elderly people’s functioning and the associated health care burden. With a growing elderly population there is an increased emphasis on fall prevention to prevent these implications. A literature gap exists regarding implementation of fall prevention programmes in South African old age homes. This study aimed to explore which evidence-based fall prevention strategies exist globally and are currently being implemented by old age homes in the Breede Valley Municipality in the Western Cape. A descriptive quantitative study design and total population sample was used. A survey data collection tool was developed based on the evidence-based fall prevention strategies found in the literature. Knowledgeable representatives of each old age home were the participants who completed the survey. The results of an extensive literature review showed that numerous evidence based fall prevention strategies are available in global literature. Although limitations in the data collection tool and process were identified, valuable findings were still obtained. Strategies implemented in the Breede Valley Municipality old age homes

include evidence based fall risk assessments, home and environmental modifications as well as medication adaptations in order to reduce falls. Interventions that are not implemented optimally in the old age homes include exercise interventions as well as employing the skills of an occupational therapist to provide home modifications to reduce falls. Furthermore, training sessions for residents, carers and staff members did not include evidence based content on fall prevention and only a few old age homes evaluate the effectiveness of their current fall prevention programmes. This speaks to a clear gap in the implementation of fall prevention strategies within this context. Further research into effective strategies in South African old age homes and awareness raising of occupational therapy's role in fall prevention is recommended.

ABSTRACT NUMBER / ABSTRAKNOMMER: 3

Community Engagement in HPTN 071 (PopART) trial: Lessons learnt from implementing a novel data collection Technique-Photo- Journal

Jabulile Mantantana (Desmond Tutu TB Centre - Paediatrics and Child health)

Background: Community Engagement (CE) is increasingly acknowledged as a core component of successful cluster-randomised trial implementation. Within research networks, implementing ethical CE is progressing in a process akin to developing institutional knowledge. However, less progress has been made in formalising process and outcome evaluation for CE. We share experiences from implementing a photo-journal activity conducted by a Community Advisory Board (CAB) for the HPTN 071 (PopART) trial as a model for evaluating community engagement in cluster-randomised trials.Methods: HPTN 071 (PopART) is a cluster-randomised trial evaluating a combination HIV prevention intervention being implemented in Zambia and South Africa. In South Africa, 9 communities are represented by a CAB of 18 members. A photo-journal exercise was conducted with CAB members between July and October 2014 and May and September 2016. CAB members were given cameras to take pictures of events which according to them represented the visibility and impact of the study in their communities. The process involved an introductory group discussion, a day of photography, semi-structured observations, and a closing-out group discussion. Results: Participation in the photo-journal activity was initially resisted because members were unfamiliar with photography as a medium for representing their community narratives. It improved as members gained experience and bought into the activity. Most photos included field teams and community representatives conducting study related activities. The photo-journal generated three types of process data about community engagement: demonstration of processes through which community engagement facilitated ethical trial implementation; acknowledgement of the trial's impact in the communities; and justification of the comparative uses of different engagement strategies per participating community. The activity provided a platform for critical reflection by the CAB and continued consultation between researchers and CAB members.Conclusion: The photo-journal activity enabled critical reflection by CAB members and researchers of the role of CE in cluster-randomised trials.

ABSTRACT NUMBER / ABSTRAKNOMMER: 4

Hospital volunteerism as health system resource solution: Motivation for both volunteer and the public sector

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A volunteer programme with 50 registered volunteers was established in 2007 at a secondary-level public, regional hospital in the Cape Winelands. This was a rapid response to the extensive renovations and system changes brought about by the hospital revitalisation initiated in 2006, which required additional human resources. This study describes the hospital volunteer programme and provides hospital administrators with practical planning guidance for hospital volunteer programme implementation.The purpose of this study is to (1) describe the outcomes of the hospital volunteer intervention and (2) to make sound recommendations for volunteer programme implementation.A qualitative case-study methodology was employed. Participants were recruited from a public hospital in the Western Cape. A case-study design was applied to explore the hospital volunteer programme implementation. In-depth interviews and a focus group discussion with thematic content analysis of transcripts, as well as document reviews were conducted to conclude the study during 2015. The key participants were individually interviewed and included two members of the hospital management, two volunteers and one volunteer coordinator. A focus group discussion consisting of three volunteers was also conducted.The findings of this study indicate that a volunteer programme can be a motivational force for both volunteers and the organisation. However, it requires co-ordination and secure funding to remain sustainable. Such a programme holds huge benefits in terms of human resources, organisational development, and gainful employment for the previously unemployed.Health services contemplating a volunteer programme should develop criteria for recruitment and selection of volunteers, and documentation for applications and identify a coordinator. Volunteers will need to be orientated, given access to in-service training and supervised. Consideration needs to be given to risk management of vicarious liability by developing a code of conduct, clear roles and responsibilities, managing staff and volunteer relationships and providing emergency care for injuries.

ABSTRACT NUMBER / ABSTRAKNOMMER: 5

Investigation into the sport interests regarding participation and spectatorship of the adults in Bishop Lavis community

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Bishop Lavis is a low socio-economic community in Cape Town. Plans to upgrade the local sports facilities to promote a balanced lifestyle and reduce crime are currently underway. Numerous studies have been done on the impact of sport in society with results showing a reduction in destructive behaviour. The aim of the study was to determine what sport facilities are available as well as what the sport interests of the community are and what they would like to participate in, actively or as spectators. Sequential mixed methods design was utilised. Phase one involved qualitative data collection by means of key informants in a focus group, with information used to develop a survey. This survey was piloted and refined. In phase two, it was distributed among a representative sample of Bishop Lavis community members. This phase involved quantitative data collection and data analysis.The results of the study show that soccer was considered by the highest number of participants (94%) to be a sport in which the community of Bishop Lavis would want to participate in. There was an increase in the number of participants that previously participated in sports, as compared to the number of participants that want to participate in sport in the future, specifically in the age group 18-25 and 25-64 years old. There was a significant increase in the percentage of participants over the age of 65 years that would like to spectate sport in the future.One of the core

concepts of Occupational Therapy is the promotion of a balanced lifestyle. Identifying Bishop Lavis community's sporting interests will enable the promotion of a balanced lifestyle through involvement in sport activities. Simultaneously it will prevent their participation in destructive activities leading to an improved overall well-being of the community.

ABSTRACT NUMBER / ABSTRAKNOMMER: 6

Measuring the influence of family physicians within the South African district health system: a cross-sectional observational study.

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Purpose - Evidence of the influence of family physicians on health care is required to assist managers and policy makers with human resource planning in Africa. Since the international argument for family physicians derives mainly from research in high income countries, this study aimed to evaluate the influence of family physicians on the South African district health system.MethodsA cross-sectional observational study design compared 15 district hospitals and 15 community health centers with family physicians to the same number without, across seven South African provinces. Facilities with family physicians were compared with matched control facilities in terms of health system performance and clinical processes.ResultsDistrict hospitals with family physicians generally scored better in terms of health system performance and clinical processes. Significantly fewer pediatric mortality-associated modifiable factors were found in these district hospitals (Mean score intervention 2.2, control 4.7, p=0.049). In contrast, the community health centers without family physicians generally scored better in terms of health system performance and clinical processes, with a significant difference in terms of continuity (Mean score intervention 2.79, control 3.03, p=0.034) and coordination of care (Mean score intervention 3.05, control 3.51, p=0.016). Conclusions In this study, district hospitals with family physicians generally scored better in terms of health system performance and clinical processes. The suggestion of a lack of or even negative influence in community health centers was surprising. The study supports the need for further research to explain the findings at the primary care level, which were not consistent with the global literature.

ABSTRACT NUMBER / ABSTRAKNOMMER: 7

RELIABILITY AND VALIDITY OF ICPC-2 FOR CODING/CLASSIFICATION OF DIAGNOSES/HEALTH PROBLEMS IN AN AFRICAN PRIMARY CARE SETTING

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BACKGROUND: Routine application of a primary care classification system to patients' medical records in primary care is low in Africa. Reliable data is crucial to unlocking the domain of primary care in Nigeria. This may be actualized through the use of a locally validated primary care classification system such as the International Classification of Primary Care, (ICPC-2). Although a few studies from Europe and Australia have reported that ICPC is a reliable and feasible tool for classifying data in primary care, the reliability and validity of the revised version (ICPC-2) is yet to be objectively determined particularly in Africa. AIM:The overall aim is to evaluate the reliability and validity of using ICPC-2 for coding and classifying diagnoses/health problems in an African primary care setting.METHODS:A descriptive analysis was carried out on ICPC-2 and ICD-10 coded data that was generated from physicians' diagnoses which was randomly selected from general out-patients' clinic attendance registers, using a systematic sampling technique. Participants comprised of two groups of coders (ICPC-2 coders and ICD-10 coders) who coded independently, a total of 220 diagnoses/health problems with ICPC-2 and/or ICD-10 respectively. RESULTS: The dataset revealed a strongly positive correlation between selected ICPC-2 codes and ICD-10 codes. An accuracy of 74.5% was achieved by ICD-10 coders who had no previous experience or prior training on ICPC-2 usageCONCLUSION:Findings support the utility of ICPC-2 as a valid and reliable coding tool that may be adopted for routine data collection in the African primary care context. The level of accuracy achieved without training, lends credence to the proposition that it is a simple-to-use classification and may be a useful starting point in a setting devoid of any primary care classification system for morbidity and mortality registration at such a critical health care level of public health importance.

ABSTRACT NUMBER / ABSTRAKNOMMER: 8

The possible role of alternative health in supporting ART regardless of CD4 count – reflections of alternative health practitioners in Western Cape, South Africa.

Nosivuyile Vanqa (Desmond Tutu TB center - Pediatrics and and child center)

Background: Earlier initiation of ART has individual benefits and reduces risk of onward transmission. ART is a medical intervention and this western biomedicine is often considered separate from alternative health practices (AHP). In contrast, AH includes a diverse range of interactions that are often primary/complementary source of care for people living with HIV in southern Africa. South Africa introduces ART regardless of CD4 count, people on ART are expected to increase from 3.5 - 6.5 million. Achieving this requires extensive health system innovation. What roles do alternative-health practitioners believe they can play? Methods: HPTN 071 is a community randomized HIV prevention trial including nine study communities in South Africa. The social science evaluation includes a qualitative cohort of families sampled for diversity. We spent 7 months – February August 2016 – interacting with various AHP networks to chart the AHP landscape in each study community and recruit AHPs into this cohort. Interactions included discussions about HIV-testing, treatment-support and views on why people seek AHPs documented in structured field notes. We later enrolled ten AHPs and we further clarified our analysis with this sub-sample. We present a thematic analysis. Results: Most AHP were at pains to stress that they do not believe they cure HIV. Rather, argue that AHPs provide support and treatment for non-HIV related problems. AHPs described ways supporting the scale-up of ART access: actively supporting referral; promoting ART; supplementary-symptomatic treatment (treating minor ailments); providing immune boosters; spiritual-support (training to become traditional-healers), and HIV-testing. Some related personal and professional experiences motivating participation in HIV care. No active collaborations between AHPs and health facilities were reported.Conclusion: AHPs highlighted willingness to support roll-out of ART regardless of CD4 count. Currently their role is under acknowledged and underutilised. Collaboration between health services and AHPs could amplify HIV prevention and treatment activities.

ABSTRACT NUMBER / ABSTRAKNOMMER: 9

Vula Orthopaedic Emergency Referral app: a successful alternative to traditional referral pathways

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Purpose of studyOrthopaedic Services in the South African public health system are severely overloaded due to large patient populations, limited orthopaedic specialists and theatre time and an exceptionally high burden of trauma. Inappropriate or poor quality referrals from primary and secondary healthcare facilities compound these difficulties. In 2016, the Division of Orthopaedic Surgery at Tygerberg Hospital introduced Vula, a smartphone app with which clinicians in peripheral facilities can submit emergency referrals instantly to an on-call orthopaedics registrar and receive feedback through the app. The current study aims to evaluate the initial success of Vula, including the quantity of referrals received and quality of feedback provided. Description of methodsThis retrospective review was based on an anonymized dataset of orthopaedic referrals made through the Vula app between 1 August 2016 and 31 March 2017. Outcomes included referrals per month and referral response times. Furthermore, 2017 referrals were classified according to referral pathway prescribed and pathway correctness. Summary of results2268 Vula referrals were submitted during the study period, increasing from 107 in August to 399 in March. In August, 75% of referrals received a response within 59 minutes whereas in March, 75% of referrals received a response within 22 minutes. Of 1082 referrals in 2017, 41% were urgent, 22% non-urgent and 33% advice only referrals with 4% of unknown outcome. Subsequent verification found that the referral pathway allocated was correct on 95% of occasions. ConclusionThe large volume of referrals received and acceptable response rate suggest that Vula represents a successful alternative to traditional referral pathways. Furthermore, the ability to manage one third of referrals with advice only highlights the potential of Vula to help alleviate the burden on tertiary orthopaedic services. Additional advantages include accurate demographic data, reciprocal accountability, adherence to certain referral standards and knowledge transfer.

ABSTRACT NUMBER / ABSTRAKNOMMER: 10

“What can a lame person do?” Narratives about People With Disabilities’ and HIV risk among people living in HPTN 071 (PopART) study communities

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Background and objectives: People with disabilities (PWD) are at higher risk of HIV acquisition. Few HIV programmes sufficiently address PWD’s needs. As the scale-up of testing and treatment occurs, HIV care services will shift from facilities to lay health workers, who work in the communities they live in. We describe ways in which people living in 21 high burden communities conceptualize disability and HIV risk. Method: HPTN 071 (PopART) is a community randomized trial evaluating an HIV combination prevention package in Zambia and South Africa. A rapid appraisal of the HIV landscape, conducted pre-trial, included 78 group discussions with community members. Participants were shown images, including of a woman in a wheelchair, and were asked to imagine the character living in their community, and discuss the character’s HIV risk. Data were transcribed verbatim. Conceptual

themes between HIV risk and disability were identified through inductive coding. Results: Narratives of HIV risk reflected two normative attitudes that deprived PWD of their sexuality by emphasizing their social and physical vulnerability. Firstly, PWD were assumed not to have active sexual lives; or secondly, they were assumed to be forced into sex in one of two ways. Either, through PWD's perceived vulnerability to sexual abuse. As a participant said "[they] help themselves with these cripples. These are people who relieve […] sexual tension". Or through PWD's perceived dependence on transactional/survival sex. As one older man said "they are exposed to […] people who want sexual favours from them in exchange for money".Conclusion: Community members' normative attitudes about PWD systematically underestimates their HIV risk and misrepresents PWD as lacking sexual agency. Scaling up HIV testing and treatment through expanded community-based services delivered by resident lay health workers should include training on HIV services for PWD to ensure that they are not (again) systematically overlooked.

ABSTRACT NUMBER / ABSTRAKNOMMER: 11

To explore the beliefs and attitudes of private GPs towards the proposed NHI

Dr Sheena Mathew (Health sciences - Family medicine)

Introduction: National health insurance (NHI) is now entering the second phase of implementation in South Africa, which will be focusing on the design of private general practitioner (GP) contracts. GP participation in NHI is needed to address severe doctor shortages and achieve national health coverage. GP enrollment in NHI pilot sites was below target levels. An in-depth understanding of GPs views on NHI and participation in NHI is needed to aid implementation strategies. Aim: To explore the beliefs and attitudes of private GPs towards the proposed NHI system.Setting: Cape Town metropole, Western Cape. Methods: This was a phenomenological qualitative study using face-to-face semi-structured interviews. 11 GPs were recruited using purposeful snowball sampling in order to interview a diverse range of GPs from different practices and communities. Data analysis was conducted using the framework approach and atlas.ti software. Results: Private GPs felt government's antagonism towards private sector and their exclusion from NHI policy processes was a barrier to NHI participation. Private GPs reservations about NHI stemmed from three main areas: implementation challenges relating to accreditation, reimbursement and infrastructure; negative impact on current practice and job insecurity within NHI. Township solo practitioners were most optimistic about engaging with NHI. Conclusion: There is a need for better collaboration between government and the private sector to encourage GP participation in NHI. GP contracts need to take into account the practice needs of group versus solo practitioners in addition to addressing practitioners fears about inferior role within NHI which could force GP emigration.

ABSTRACT NUMBER / ABSTRAKNOMMER: 12

Vula Mobile App: Improving referral systems in the Western Cape

William Mapham (Stellenbosch University - Ophthalmology)

Preliminary research in 2014 showed the usability of the Vula Mobile app at Tygerberg Hospital and that mobile phones have a role to play in improving referrals to the Eye Clinic at Tygerberg Hospital. Vula Mobile has since expanded beyond ophthalmology to twelve specialties and is being used to accept referrals at four hospitals in the Western Cape, namely Tygerberg, Khayelitsha, Worcester and Karl Bremer. Vula Mobile is also in use in the Northern Cape and Gauteng. Over 14000 referrals have been made. An average of 25% of referrals to specialist departments are now managed at the

primary health facility with advice given by the specialist on call via the Vula Mobile app. In addition, the app is used to arrange elective appointments as well as refer emergency cases. The referral data collected is being used for research in the Burns and Orthopaedic departments at Tygerberg Hospital. Anecdotal reports indicate time and cost savings and appreciation from the primary health workers for the case by case training. Further health economics research is required to evaluate the extent of the impact on the health system.

ABSTRACT NUMBER / ABSTRAKNOMMER: 13

Conceptualizing Competency-Based Education in the Context of Undergraduate Health Professions Education in South Africa

Mariette Volschenk (Faculty of Medicine and Health Sciences, Stellenbosch University - Centre for Health Professions Education)

In 2011 the Health Professions Council of South Africa contextually adapted the CanMEDs competency framework as an organizing framework of Core Competencies for undergraduate health professional education programmes in South Africa. Since this framework consists of competency domains that include, but also go beyond the traditional biomedical aspects of patient care, the Faculty of Medicine and Health Sciences (FMHS) at Stellenbosch University (SU) concurrently adopted it as a Graduate Attributes framework.Full-scale implementation of the Graduate Attributes framework at SU FMHS has proved challenging so far, possibly due to diverse understandings among faculty regarding concepts such as Graduate Attributes, Outcome-Based Education, and Competency Based Medical Education (CBME), as well as the implicit curricular implications of each. The more generic competencies may additionally pose methodological challenges in terms of teaching and assessment.This conceptual paper reports on a discussion paper that was compiled by the author to address the need for a common understanding of the concept CBME and its potential influence on the health professional education continuum. It provides an overview of the development of the SU FMHS Graduate Attributes framework, incorporates various theoretical perspectives, clarifies important concepts, explores related curricular implications, and proposes relevant recommendations.This paper concludes that the approach to competency-based training as used in postgraduate first-world medical education contexts may not always be suitable for application in all areas of health professions education, particularly with respect to undergraduate health professional education in resource constrained contexts such as SU FMHS. However, the notion of competencies in the form of professional roles that correspond notably with SU FMHS's vision for graduate outcomes is considered a valuable concept for informing the development of the SU FMHS Graduate Attributes, and various tenets of CMBE may prove useful in informing the teaching, learning and assessment of graduate attributes at the Faculty.

ABSTRACT NUMBER / ABSTRAKNOMMER: 14

The Development of Competencies in an Outcomes-Based Paediatric Curriculum from a Student Perspective

Dr Liezl Smit (Stellenbosch University - Paediatrics and Child Health), Dr. Lakshini McNamee (Stellenbosch University - Centre for Health Professions Education (CHPE))

The adoption of a competency framework prompted a need for reform of the current integrated, outcomes-based undergraduate Paediatrics and Child Health (PCH) curriculum. The competencies that students currently develop, and the factors that enable or constrain this development were not

formally documented. Students, as the recipients of the curriculum, have the right and responsibility to be involved in curricular evaluation and improvement. This study explored students' experiences of the development of competencies at Stellenbosch University (SU).A qualitative descriptive study involved final year medical students who had completed their paediatric training. Eleven students were interviewed either individually or in focus groups. Both inductive and deductive processes of data analysis were used. The Association of American Medical Colleges' (AAMC) general core Entrustable Professional Activities (EPAs) for medical school graduates entering internship, were used as an analytic framework. Students reported confidence in performing the majority of the AAMC listed professional activities. Uncertainty was expressed in performing tasks that they had not practiced during their training. Clinical exposure, active participation as part of a ward team, high expectations, and approachable clinician educators were enabling factors in the development of clinical competencies. In the early rotations, students reportedly were passive bystanders resulting in feelings of alienation and disempowerment. Adopting a strategic approach to learning had undermined the development of competencies. Students also expressed concerns regarding their general paediatric knowledge and skills as they were mostly trained in a tertiary setting.Students reportedly do develop clinical competencies within an integrated outcomes-based undergraduate curriculum if clinical exposure is appropriate and allows for active engagement. Early rotations at SU represented missed learning opportunities, and lacked contextualised exposure to common paediatric conditions in preparation for clinical practice in South Africa. Students are valuable contributors to curricular reform and should be included in processes of curriculum renewal wherever possible.

ABSTRACT NUMBER / ABSTRAKNOMMER: 15

Training of workplace-based clinical trainers in family medicine, South Africa: Before-and-after evaluation

Robert Mash (Stellenbosch University - Family and Emergency Medicine), Julia Blitz (Stellenbosch University - Family and Emergency Medicine), Jill Edwards (Royal College of General Practitioners), Steve Mowle (Royal College of General Practitioners)

BackgroundEffective primary health care is delivered by multidisciplinary teams that include a family physician. The supply of newly qualified family physicians (FP) in South Africa is low and the quality of clinical training is one key factor. Training of FPs in the district health services is a relatively new phenomenon for both educational and health systems. This study aimed to assess the effect of an innovative 5-day national course on the FP's capability to be a clinical trainer in the workplace.MethodsBefore-and-after study using a 360-degree questionnaire of 38 FP's capability as a clinical trainer completed by their trainees. Data was collected at baseline and 3-months later for two courses run in 2016. Qualitative feedback on changes to their practice as a clinical trainer was also collected 6-weeks after the course in 2017 with 18 FPs.ResultsClinical trainers had a high level of improvement in: Overall contribution and engagement with registrar training, provision of meaningful and formative feedback that contributed to individual learning in the workplace, development of a more facilitative style of training, their confidence in their role as a clinical trainer, their approachability.ConclusionThis short course enhanced the capability of FPs to be effective clinical trainers in the workplace. The benefits of this short course should be reinforced by ongoing formative assessment and development. The short course should be offered to all South African FPs involved in clinical training and to other countries in the region with similar needs.

ABSTRACT NUMBER / ABSTRAKNOMMER: 16

Counting the cost: Interactive online tutorials in Anatomy education

Alexander Keiller (Stellenbosch Unoversity - Centre for Health Professions Education), Amanda Alblas (Stellenbosch University - Anatomy and Histology), Jaudon Foiret (Stellenbosch University - Anatomy and Histology), Lianne Keiller (Stellenbosch University - Centre for Learning Technologies)

Inequalities in the South African schooling system result in a first year cohort starting their studies on an uneven playing field. This has become a cause for concern within the Anatomy and Biology components of the Life Forms and Functions of Clinical Importance in the Interdisciplinary phase with the Faculty of Medicine and Health Sciences. Lecturers are faced with increasing student numbers and limited time for revision lessons aimed at ensuring that all students are equally prepared for the rest of the semester. In this study, the investigators created online tutorials to be delivered via the Learning Management System, SUNLearn. These lessons allow students to independently work through content they may not have understood in the lecture period at a pace that is conducive to their own learning needs. Additionally, it allowed the lecture team to identify concepts that required extra revision in class, and students who needed extra support. The prevailing question is, how easy is this for other lecturers to do? With an increase in pressure to incorporate blended and online teaching approaches within the University, understanding the investment that is needed to create this type of content is important for lecturers as they weigh up the options available to them. This is often a concern within this type of innovation, though research rarely focuses on the human, time and financial resources required to achieve the educational gains1.In this presentation, we address the lecturer investment in time, as well as the support needs that this team experienced in achieving their goal of creating adaptive learning opportunities. We count the cost, and discuss the relevance of this within the drive to decentralise our teaching practice within the FMHS.

ABSTRACT NUMBER / ABSTRAKNOMMER: 17

Evaluating an isiXhosa Clinical Communication course at a health sciences faculty

Madelé Du Plessis (Stellenbosch University - Language Centre)

Background:It is important that healthcare professionals are able to communicate in the language of their patients. When language barriers between the healthcare professional and patient occur, effective communication cannot take place; thus high quality care cannot be delivered. Many medical schools implement language programmes to equip students with language skills. However, these language programmes often tend to focus on language use in general situations, rather than focusing on clinical communication. Furthermore, these programmes do not necessarily comply with the requirements of the communicator competency of the CanMEDS framework. The aim of this study was to determine whether the isiXhosa clinical communication course implemented at Stellenbosch University Faculty of Medicine and Health Sciences is enabling students to communicate in the language of their patients. In addition, the research aimed to determine whether the communication course effectively contributes to the development of the communicator competency of the CanMEDS framework.Methods: Data was gathered by means of individual interviews, questionnaires, observations, as well as a document analysis. Two distinct populations were sampled, namely students and lecturers involved in the isiXhosa clinical communication course. The students included Occupational Therapy (third year) students, Human Nutrition (third year) students, and Speech-Language and Hearing Therapy (fourth year) students.Findings:The course material provided to

students is not fully aligned with the requirements of the communicator competency. Therefore, students only have limited knowledge and vocabulary. However, even with limited knowledge, they are still able to apply what they have learnt, enabling them to establish a positive relationship with patients.

ABSTRACT NUMBER / ABSTRAKNOMMER: 18

EXPLORING THE OPTIMAL ROLE OF RESIDENCE HEADS IN PROMOTING STUDENT SUCCESS: AN INSTITUTIONAL CASE STUDY

Johan Groenewald (PhD) (SU, Centre for Student Communities (CSC) - CSC, SU Student Affairs)

Attempts to improve student success in higher education are becoming more holistic and integrated in nature, while also acknowledging that informal out-of-class learning environments can significantly contribute to promoting student success. Such out-of-class environments include student residences. In South African higher education too there is a growing awareness of the role that residences could play in promoting student success. The complexity of the South African higher education context within which Stellenbosch University (SU) finds itself makes envisaging the optimal role of the residence head in the future SU challenging. The research question this study seeks to answer is: What is the optimal role of residence heads in promoting student success at a higher education institution? As this research problem is vague, broad, complex and systemic, the study needed to conceptualise various student success levels. This study adopted an interpretivist research paradigm. The research design was an explorative revelatory single case of the residence environment at SU. The research method for data gathering and data analysis was Interactive Qualitative Analysis (IQA). The most significant finding of the study is that the optimal role of the future residence head is a blended role of being a leader and playing an intentional educational role. This PhD study makes contributions at the theoretical and practical level as far as the framework for student success is concerned. It also makes theoretical, policy and practical contributions as far as the role of the residence head is concerned. The conceptualised student success framework would allow higher education institutions the option of assessing their student success approach towards residences and the residence head role. The findings of the study are also significant in that they suggest practical educational skills sets for residence heads to contribute to achieving student success at the different levels of the framework.

ABSTRACT NUMBER / ABSTRAKNOMMER: 19

Generic skills in the Inter-Professional Phase of the curriculum: How do students experience it?

Alwyn Louw (Stellenbosch University (CHPE) - Centre for Health Professions Education)

In a response to the demand of providing a curriculum that addresses the scientific as well as the much-needed generic skills students need, the FMHS implemented such a curriculum in 2008. A formative curriculum evaluation research process after implementation was completed in 2011. Another research project, which specifically focused on the generic skills education of the curriculum, followed-up the initial research process four years later.Summary of work:The evaluation process focused on the first semester of the first year of the curriculum – the so-called Inter-Professional Phase. We followed a qualitative research approach with data collected by means of focus groups, in-depth interviews and textual module evaluation documents. Data analysis was aimed at the identification of the main areas of concern to the stakeholders.Summary of results:The expectations

students have when they arrive at university, play an enormous role in their initial motivation to study in the health professions. These expectations are not always met, but it have a major influence on their perceptions about the curriculum. A realisation about the presence of certain elements and reasons for the structure of the curriculum, occurs only in the later years. Students regard many aspects of the curriculum as pointless and some aspects even cause some negativity amongst students. Fortunately, students regarded many other aspects important and necessary to be included in the Inter-Professional Phase. A major finding was that the imbedding and teaching of generic skills in a curriculum depends much on the way in which these skills are contextualised within the health sciences curriculum, and the role that university teachers play is very important in terms of reliability and motivation. Conclusions:The results from this study can change the way in which faculty plan to incorporate the much crucial generic skills students need into the curriculum in future.

ABSTRACT NUMBER / ABSTRAKNOMMER: 20

It is not only what we do but how we do it: Transformative action learning as responsive service delivery.

Martha Geiger (Stellenbosch University (and University of Cape Town) - Centre for Rehabilitation Studies), Sinegugu Duma (University of Cape Town (and now University of KwaZulu-Natal) - UCT: Division of Nursing & Midwifery/UKZN: Dean of Teaching & Learning College of Health Sciences), Theresa Lorenzo (University of Cape Town - Division of Disability Studies)

BACKGROUND: In South Africa, the prevalence of children with severe disabilities is increasing, yet rehabilitation services for these children receive low priority. Reasons include human and other resource shortages and unclear rehabilitation outcomes in this population. In line with the International Classification of Functioning, Disability and Health, social participation should be the goal of intervention. Furthermore, international and local human rights policies mandate that every child has a right to social participation. Heeding the call for transformation in rehabilitation goal-setting and implementation, we explored an intervention with (rather than for) mothers and their children with severe disabilities. THE PURPOSE of the study was to explore ways of enhancing social participation of the participants' children in contextually appropriate, culturally appreciative and sustainable ways.METHODS: A qualitative action research study was implemented with 44 participant-mothers of children with severe cerebral palsy from under-resourced isiXhosa language contexts in the Western Cape. Data collection included iterative cycles of action-reflection group sessions, reflective dialogues and participant observations. Data analysis comprised in-group collaborative analysis and interpretive thematic content analysis.FINDINGS: Twelve action learning outcomes included the identification of diverse cultural elements, which the participating mothers implemented and 'tested' to enhance the social participation of their children. We formulated a set of transferable recommendations to other mothers of children with severe disabilities in similarly under-resourced contexts. The action research process resulted in extensive transformation in all concerned. The use of such a transformative action learning research approach as an intervention approach has implications for rehabilitation practice and moreover, the training of rehabilitation professionals.CONCLUSIONS: There is a need to re-frame culture as a resource in supporting the participation of children with severe disabilities. The value of transformative action learning as an intervention approach needs to be explored further, implemented in practice and included in student training.

POSTER PRESENTATIONS / PLAKKAATAANBIEDINGS

ABSTRACT NUMBER / ABSTRAKNOMMER: 21

Can STI screening be suitably integrated into community-based HIV testing services for men in Cape-Town, South Africa?

Margaret van Niekerk (Desmond Tutu TB Centre, Stellenbosch University; - Department of Paediatrics and Child Health)

In sub-Saharan Africa, a 59% increase in new cases of curable STIs has been reported. Having an STI increases the chances of acquiring HIV infection. Men do not typically get screened for STIs because they do not access health services. Community-based HIV testing (CBHTS) services for HIV and other integrated services offer early case detection&linkage to care for populations who do not typically access health services.This study describes the proportion of clients (HIV infected&uninfected) with STI symptoms disaggregated by males and females.MethodsFive CBHTS centres were established in HIV prevalent communities around Cape Town. Clients self-referred for HTS at either fixed sites/on a mobile basis; services were provided from a mobile van and tents set up at main thoroughfares in the community. All clients were screened for STI symptoms, presentation of 1 or more symptoms would result in referral to a STI health facility. Data was collected between August 2013-August 2016 and entered into a Microsoft Access database & validated. ResultsOverall, 68 877 clients tested for HIV, 34 688(50.3%) were male.2 662 (4%) were HIV+. 6% of HIV+ females reported STI symptoms, 4% of HIV+ male clients reported STI symptoms. A higher proportion of HIV negative men reported STI symptoms compared to HIV negative females (91%vs84%). HIV negative clients were more likely to link to a health facility for STI services compared to HIV+ clients (50%;47%vs19%;10%).HIV+ men were more likely to link to a health facility for STI services compared to females (p<0.001;19%vs10%). Conclusion An integrated HIV and STI service within the community can identify men with STI symptoms and refer them to diagnostic services. Screening HIV negative male clients for STIs can identify those clients who still practice high-risk sexual behaviour. This data identifies the urgent need for the re-prioritisation of condom promotion and programs.

ABSTRACT NUMBER / ABSTRAKNOMMER: 22

Challenges faced and lessons learned from doing overviews of systematic reviews of complex interventions

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Background:We are conducting an overview of systematic reviews of interventions to improve food security in low- and middle income countries (LMICs). For overviews covering broad topics and complex interventions, selecting eligible studies, extracting useful data, and synthesising and presenting results in a meaningful way can be challenging. Objectives:To highlight methodological challenges faced when conducting overviews of systematic reviews of complex interventions; and to suggest approaches to address these challenges.Methods:We describe the challenges we encountered when selecting eligible systematic reviews, extracting data and presenting the findings for our overview. Furthermore, we asked input from colleagues who had done overviews before for

guidance on ways to overcome the identified challenges. We also searched for published examples of overviews of systematic reviews of complex interventions. We drew on these sources to identify potential approaches to address the challenges we faced. Results:We tabulated the challenges encountered regarding study selection, data extraction, quality assessment, and summarising and presenting results of our overview. Potential approaches to address these challenges were drawn from input from three colleagues; one paper on the risk of bias in overviews; one systematic review, and five overviews of systematic reviews. We also drew on tools such as AMSTAR, ROBIS, SUPPORT summary checklist, and critical appraisal worksheets for intervention questions. Conclusion: Although some of the challenges of doing overviews of systematic reviews may be unique to the specific overview question, many may have been encountered by other researchers. It is valuable to share experiences and learning to inform future approaches.

ABSTRACT NUMBER / ABSTRAKNOMMER: 23

Exploring the use of a couple's functionality assessment tool in high HIV-risk communities in the Western Cape

Ginny Bond (Zambia AIDS-related Tuberculosis Project (Zambart) - School of Medicine, Ridgeway Campus, University of Zambia), Graeme Hoddinott (Desmond Tutu TB Centre - Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University), Laing de Villiers (Desmond Tutu TB Centre - Department of Paediatrics and Child Health, Faculty of Medicine and Health Sciences, Stellenbosch University), Lindsey Reynolds (Department of Global Health - Faculty of Medicine and Health Sciences, Stellenbosch University)

Background: In southern Africa HIV is a generalized epidemic, where the majority of new HIV infections result from sexual transmission. People who are in need of HIV-related health services are those forming or part of sexual relationships. This presentation functions as a thinking process into early ideas toward further study for the graduate researcher. We describe a cohort of sexually active people's perceptions of their relationship quality with their current or most recent partner with a quantitative survey as well as qualitative insights. Methods:We administered an adapted version of the Couple's Functionality Assessment Survey (CFAT) (a survey-based toolkit measuring key dimensions of couple relationships developed by the Catholic Relief Services) to a cohort of 185 individuals - 50 of whom had disclosed that they are living with HIV to the researchers. In addition, we had one-on-one in-depth interviews focusing on "love, sex and romance" with the participants. The CFAT measured four domains of relationship functioning: perceptions of intimacy, partner support, sexual communication (our own adapted questions) and partner communication (measured with a 5-point Likert scale). An exploratory analysis was done by the graduate researcher to investigate initial results from the quantitative survey and to help think around themes and ideas from some of the qualitative discussions. Results and Discussion: Early results show that women report consistently lower scores on all four scales than men and that both men and women seemed to score higher relationship quality than was reported in the qualitative results. The participants also reported high levels of gender-based violence, gender inequality, multiple sexual partners as well as low condom use. These in-depth discussions can narrate the participants' relationships in great detail, speaking further how relationship quality is important to understand HIV related care.

ABSTRACT NUMBER / ABSTRAKNOMMER: 24

How well do public sector primary care providers function as medical generalists in Cape Town: a descriptive survey.

Renaldo Christoffels (Division of Family Medicine and Primary Care - Division of Family Medicine and Primary Care)

IntroductionEffective primary health care requires a workforce of competent medical generalists. In South Africa nurses are the main primary care providers, supported by doctors. Medical generalists should practice person-centred care for patients of all ages, with a wide variety of undifferentiated conditions and should support continuity and co-ordination of care. AimTo assess the ability of primary care providers to function as medical generalists. SettingTen community health centres in the Tygerberg sub-district of the Cape Town Metropole.MethodsA randomly selected consultation was audio-recorded from each primary care provider. An assessment tool was used to score 16 skills from each consultation. Consultations were coded for reason for encounter, diagnoses and complexity. Inter- and intra-rater reliability was evaluated.Results45 practitioners participated (response rate 85%) with 20 nurses and 25 doctors. The overall median percentage score was 25.0% (IQR 18.8 – 34.4). Median percentage for nurses was 21.6% (95% CL 16.7 – 28.1) and for doctors was 26.7% (95% CL 23.3 – 34.4) (p = 0.17). Ten of the 16 skills were not performed in more than half of the consultations. Six of the 16 skills were partly or fully performed in more than half of the consultations and these included the more biomedical skills.ConclusionPractitioners did not demonstrate a person-centred approach to the consultation and lacked many of the skills required of a medical generalist. Doctors and nurses were not significantly different. Improving medical generalism may require attention to how access to care is organised as well as to training programmes.

ABSTRACT NUMBER / ABSTRAKNOMMER: 25

Inhaling risk, exhaling health: "A scoping review of drug use and HIV risk in the era of universal test and treat in South Africa"

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The shift towards universal access to HIV prevention and treatment services in South Africa requires nuanced understandings of those most at risk of HIV infection. Drug users are at higher risk of acquiring HIV and of being excluded from prevention and treatment efforts. In South Africa exploring local interplays between drug use, HIV risk, and health service access can serve to strengthen HIV care. A scoping review was conducted to establish current knowledge parameters and conceptualisations of drug use and HIV risk in South Africa. The review included a search of five databases to identify relevant South African-specific articles focussing on drug induced behaviour. We used words "drug use" and "South Africa" to identify South African-specific articles. All relevant articles were summarised, collated, and themes were identified.Four themes related to drug use and HIV risk were identified: 'South Africa contrasts with the global profile': As opposed to HIV risk through needle sharing, non-injectable drugs (e.g., dagga, tik) were most common in the South African context and HIV risk is framed in terms of drug-induced behaviour, and relationship violence; 'Co-incidence with high-risk behaviours': studies explore drug use as ancillary to 'chief' high-risk behaviours, e.g., sex-work and men having sex with men; 'Possible misrepresented drug user profile': studies concentrate on in-patient settings, schools, or other 'at risk' sites (e.g., known sex-worker locations) which may obscure the drug user profile in South Africa. "Gendered focus of drug use and HIV": Women who use drugs are at a higher risk of acquiring HIV. Although drug use in South Africa is widespread, limited information is available on its variability in the general population and its relation

to HIV risk and service access. Continued research on the drug user profile in South Africa is needed as intervention programmes currently rely on global research.

ABSTRACT NUMBER / ABSTRAKNOMMER: 26

Integrity in reporting research: Perspectives from LMIC health researchers

Anke Rohwer (Centre for Evidence-based Health Care, Faculty of Medicine and Health Sciences, Stellenbosch University - Global Health), Taryn Young (Centre for Evidence-based Health Care, Faculty of Medicine and Health Sciences, Stellenbosch University - Global Health), Elizabeth Wager (Sideview), Paul Garner (Liverpool School of Tropical Medicine)

BackgroundIn low- and middle-income countries (LMICs), research integrity is increasingly important. To promote integrity in reporting research, we need to understand the current situation in terms of what LMIC researchers think and what is happening at institutions.ObjectivesTo explore LMIC health researchers' perceptions, experiences and awareness of reporting practices in relation to authorship, redundant publication, plagiarism and conflict of interest.MethodsWe conducted an online survey and follow-up interviews with authors of Cochrane reviews from LMICs. We developed and piloted a questionnaire containing scenarios related to authorship, redundant publication, plagiarism and conflicts of interest. We set up the survey on Google and invited participants via email. We conducted interviews with willing respondents via telephone or Skype. Quantitative data were analysed with SPSS. We used the framework method to analyse qualitative data. Ethical approval was obtained and anonymity of responses ensured. Results We obtained a response rate of 34% (199/583). Most respondents thought that adding (65%; 129/198) or omitting (98%; 195/198) an author, text-recycling (71%; 141/198), translating a text (95%; 189/198) or copying an idea (90%; 178/198) without acknowledgement of the source, and not declaring a financial (87%; 173/198) or non-financial conflict of interest (76%; 151/198) was unacceptable. However respondents indicated that these practices did occur at their institutions. Guest authorship was the most common practice and 77% of respondents stated it occurred in their institution. Four main themes emerged from the interviews: 1) Authorship rules are simple in theory, but not consistently applied; 2) Academic status and power underpin behaviours; 3) Institutions and culture fuel bad practices; and 4) Researchers are uncertain about what conflicts of interest are.ConclusionsGuest authorship emerged as an important problem across regions. There is a need for institutional guidance and senior commitment to promote good practices and a culture of research integrity.

ABSTRACT NUMBER / ABSTRAKNOMMER: 27

Mobility, Labour Migration, and HIV Service Access – A Case Study of an HPTN 071 (PopART) Study Community in the Cape Winelands, South Africa

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South Africa's history of racial segregation and migrant labour has led to community boundaries and memberships that are often contested and fluid. In these spaces, individuals are also often highly mobile. As the number of South Africans eligible for antiretroviral treatment (ART) nearly doubles with implementation of the policy for initiating ART regardless of CD4 count, how do these historically determined patterns of fluidity and mobility shape expanding HIV service access? HPTN 071 (PopART) is a community-randomised trial of a multi-component HIV prevention intervention in Zambia and South Africa. The study community profiled in this analysis comprises the catchment area of a primary healthcare clinic which consists of four distinct neighbourhoods that reflect socio-economic and racial divisions. As part of the social science component of the trial, we conducted multiple interviews with 22 families between 2014 and 2017. Supplementary data from clinic and community-based observations further inform this research.Service access was highly variable within the clinic catchment area. Spatial dynamics shaped this variability in four key ways: 1) Physical distance to clinic: The distance individuals must travel to access clinic services; 2) Perceived social distance: Services can be distant due to socioeconomic or racial divisions between neighbourhoods and between individuals and clinic/service spaces; 3) Cyclical absences and migrations: Individuals travel to neighbouring provinces for holidays, to observe traditions, or for labour; 4) Multiple household membership: Individuals may spend parts of the week/month in different households.Describing the spatial dynamics of variable health service access in one community helps to understand the gaps between current health service procedures and the fluid and changing nature of everyday life in South African communities. Alternatives to traditional facility-based and community outreach services are necessary to reach highly mobile populations in permeable communities.

ABSTRACT NUMBER / ABSTRAKNOMMER: 28

Point of Care Testing Audit into the Awareness and Practices of Medical Staff at Tygerberg Hospital: Focusing on Glucose, Blood gas and Urine Reagent-strip monitoring.

Thumeka Jalavu (NHLS - Chemical Pathology)

BACKGROUND: Point of Care Testing (POCT) is testing done near or at the site of patient, providing rapid information and improving patient outcomes. POCT has many advantages; it also has some limitations which affect its use and implementation. It is important for ward personnel using POCT devices to have a basic understanding of this. Hospital staff requires regular training to refresh their knowledge and skill in performing POCT as recommended by international standards. This project aims to gather information from regular users of POCT at Tygerberg hospital regarding the use and training of staff in POCT. METHODS: A questionnaire containing 30 questions was circulated in the hospital. Approximately 160 questionnaires were delivered to 55 wards, emergency units and out-patient clinics. Out of the 160 sent, 68 questionnaires were returned completed. Data analysis was done on excel with basic descriptive statistics. RESULTS: Most respondents were nursing staff (88%) and the rest were medical doctors (12%). The majority indicated that POCT is necessary (84%). Some (51%) reported to have had some formal training in at least one test; 37% reported to have never had any formal training in POCT. Of those with formal POCT training, the interval since training ranged from 6 months (17%) to 2 years (40%); most reported no competency assessment following training (67%). Many respondents (53%) did not know if any validation of new instruments was performed prior to use; only 29% indicated some validation was done by the clinical engineering department. CONCLUSIONS: The findings indicate that nurses currently receive minimal training in test principles, quality control and competency assessment. To maintain the quality of POCT staff training and quality control processes need to be considered. This project gives an overview of the strengths and limitation of the hospital POCT programme and the opportunity to improve these services.

ABSTRACT NUMBER / ABSTRAKNOMMER: 29

Public vs Private: Why do most Speech and Language Therapists in South Africa choose to work in the private sector?

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There is a growing need for the Speech-Language Therapy profession to address the needs of the population by adopting a public health care discourse (Law, Reilly & Snow, 2013). However, in South Africa, the majority of the population continues to be served by a minority of Speech-Language Therapists (SLT's) working in the public health sector. No previous studies addressing the motivations of SLT's to work in either the public or private sector could be sourced. Knowledge of factors influencing job satisfaction can however assist the healthcare system with recruiting and retaining SLT's in the public sector (Randolph, 2005). This study therefore aims to identify the intrinsic and extrinsic factors which motivate SLT's to work in the private sector rather than the public sector, and to explore their perceptions of both the experience gained in the community service year and the availability of their services to the South African population. The study made use of a quantitative, explorative observational approach. A sample of 26 private practising SLT's who completed their community service year between 2004 and 2014, completed an online survey consisting of open- and closed-ended questions. Results suggest that factors influencing job satisfaction include the availability of posts, management of the Department of Health, case load, availability of resources, salary, and the work environment. Ultimately, these factors influence SLT's motivations to work in the private sector. Implications of the findings aim to address policies at departmental level. Keywords: Speech-Language Therapy, public health, private sector, motivations, population

ABSTRACT NUMBER / ABSTRAKNOMMER: 30

Quantitative analysis of news reporting on new medical research at six South African newspapers

Wilma Stassen (Stellenbosch University - Department of Journalism - Faculty of Arts & Social Sciences)

News articles reporting on new medical research have the potential to impact on people's health—not only by influencing individual behaviour, but also informing health professionals and policymakers about new medical findings.This study measured the standards of news reports on new medical research that were published in six daily newspapers in South Africa during 2014.Using a rating model based on 10 criteria of features that constitute a good health news article, each article was analysed and rated. The ratings from individual articles were combined to form an average rating of each newspaper, and averages for each criterion highlighted strengths and weaknesses in the reporting of new medical research at each newspaper.Addition information about the number, placement, and origin of articles were also collected and provided insight into the importance newspapers ascribed to reports on new medical research.The findings showed that although the average scores varied widely between individual newspapers, there were definitive trends in high- and low-scoring criteria that applied to all publication.In general the newspapers that were assessed fared

well on some very important basic principles of science reporting, such as grasping the quality of evidence and avoiding disease mongering, but much more can be done to improve the standard of reporting on new medical research. The research showed that articles need to engage more critically with new research by highlighting benefits and risks of a new medication or technology, adding comment from independent sources, and ensuring that they only report on peer reviewed research . Journalists must also do more to inform readers of the accessibility and the true value of new research, by discussing availability and cost and benchmarking it to other therapies.

ABSTRACT NUMBER / ABSTRAKNOMMER: 31

Research integrity in low- and middle income countries: systematic review of prevalence of poor authorship practice, plagiarism and other misconduct

Anke Rohwer (Centre for Evidence-based Health Care, Faculty of Medicine and Health Sciences, Stellenbosch University - Global Health), Taryn Young (Centre for Evidence-based Health Care, Faculty of Medicine and Health Sciences, Stellenbosch University - Global Health), Elizabeth Wager (Sideview), Paul Garner (Liverpool School of Tropical Medicine)

BackgroundGood reporting practices are important to preserve research integrity. There are few published studies on research integrity in low- and middle income countries (LMICs). Taking stock of existing studies is important to inform future research and promote best practices. ObjectivesTo identify and summarise empirical studies about research integrity in LMICs in relation to poor authorship practice, plagiarism and other misconduct MethodsWe included empirical studies on research reporting practices (e.g. authorship, plagiarism, conflicts of interest) amongst health researchers in LMICs. We searched electronic databases and contacted experts in the field to identify relevant studies. Study selection, data extraction and quality assessment was done by one author and checked by another. We contacted authors when data was missing. We narratively synthesised results. ResultsOf 6930 unique citations, we included 38 studies in the review and 35 in the analysis. These comprised cross-sectional surveys of health researchers (n=24) and cross-sectional studies of research articles (n=35) and examined issues around authorship (n=9), plagiarism (n=10), conflicts of interest (n=6), duplicate publication (n=2) and research misconduct in general (n=8). Most studies were judged as having moderate to high risk of bias and were poorly reported. Studies mostly reported on prevalence of research misconduct. Across studies, the prevalence of guest authorship varied from 6% to 66%, ghost authorship from 6% to 43%, plagiarism from 5% to 89%, absence of declaration of conflicts of interest 45% to 98%, duplicate publication 5% to 21%, data fabrication from 0% to 57% and data falsification from 0% to 91%. Factors influencing misconduct included lack of knowledge and experience, institutional shortcomings such as lack of consequences, pressure from funders and need for recognition.ConclusionsStudies from LMICs reported high rates of research misconduct. However, outcomes were measured in various ways and studies were mostly at high risk of bias.

ABSTRACT NUMBER / ABSTRAKNOMMER: 32

The perceived impact of family physicians on district health services in South Africa: a cross-sectional survey

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University - Family Medicine), Prof Wilhelm Johannes Steinberg (University of the Free State - Family Medicine), Ms Tonya M Esterhuizen (Stellenbosch University - Biostatistics Unit, Centre for Evidence Based Health Care)

BackgroundEvidence from first world contexts support the notion that strong primary health care teams contain family physicians (FPs). African leaders are looking for evidence from their own context. The roles and scope of practice of FPs are also contextually defined. The South African family medicine discipline has agreed on six roles. These roles were incorporated into a family physician impact assessment tool, previously validated in the Western Cape Province. MethodsA cross-sectional study design was used to assess the perceived impact of family physicians across seven South African provinces. All FPs working in the district health system (DHS) of these seven provinces were invited to participate. Sixteen respondents per enrolled FP were asked to complete the validated 360-degree assessment tool.ResultsA total number of 52 FPs enrolled for the survey (a response rate of 56.5%) with a total number of 542 respondents. The mean number of respondents per FP was 10.4 (SD = 3.9). The perceived impact made by FPs was high for five of the six roles. Co-workers rated their FP's impact across all six roles as higher, compared to the other doctors at the same facility. The perceived beneficial impact was experienced equally across the whole study setting, with no significant differences when comparing location (rural vs. metropolitan), facility type or training model (graduation before and ≥ 2011).ConclusionsThe findings support the need to increase the deployment of family physicians in the DHS and to increase the number being trained as per the national position paper.

ABSTRACT NUMBER / ABSTRAKNOMMER: 33

The quality of integrated HIV and TB treatment and care: a scoping review

C. Hüsselmann, F Behroozi, C Ramnarayan, L Dudley (Stellenbosch University - Department of Global Health)

BACKGROUNDSouth Africa has a co-epidemic of HIV and TB, with little integration and suboptimal quality of care and outcomes. Innovative evidence-informed strategies, with clear standards and measures, are needed to guide the delivery of quality integrated HIV and TB care to improve patient outcomes. OBJECTIVESTo define the quality of integrated HIV and TB treatment and care; describe current guidelines, policies, standards and measures for the quality of care and identify models for improving the quality of HIV and TB care.METHODSKey terms were used to systematically search the Cochrane Library and 9 other databases, complemented with a manual reference search, grey literature and expert consultations. A standardized data-charting form was used and papers reviewed independently by three authors. Key findings were synthesized in a narrative. RESULTS113 publications met the review criteria. Policies, guidelines and standards on quality of care are evolving for HIV and TB and vary across countries. Defining a core set of quality indicators for individual HIV clinical care is controversial with none defined for TB or integrated care. For HIV, high income countries measure individual clinical indicators, while LoMICs measure population indicators, often driven by the funding requirements of multiple donors rather than the clinical needs of populations, resulting in an anarchic system with numerous indicators. Models of integrated HIV and TB care have mixed results, but improvement collaboratives have potential to improve care. CONCLUSIONQuality of care is affected by context and policy environment, which should be evaluated. Measures of HIV/TB quality should include predictive indicators for treatment survival and assess the continuum of care with critical points such as linkage to care, retention in care and important patient reported and clinical outcomes. Evidence on the effectiveness of models of integrated care and evidence-based strategies to improve care is needed.

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Theme 2 / Tema 2

*I*nfectious *D*iseases/

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ABSTRACTS/ABSTRAKTE

Oral Presentations / Referate

ABSTRACT NUMBER / ABSTRAKNOMMER: 1

A CANINE INTERFERON-Γ RELEASE ASSAY FOR THE DETECTION OF MYCOBACTERIUM BOVIS INFECTION IN AFRICAN WILD DOGS (LYCAON PICTUS).

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SVEN PARSONS (STELLENBOSCH UNIVERSITY)
MICHELE MILLER (STELLENBOSCH UNIVERSITY)

Infectious diseases, including bovine tuberculosis (bTB) caused by Mycobacterium bovis, could have a detrimental impact on conservation of the African wild dog (Lycaon pictus). However, there are no tests for the diagnosis of bTB in this species. This study aimed to develop a novel Interferon-γ Release Assay (IGRA) using commercially available reagents. Whole blood was collected from 39 randomly selected M. bovis-exposed wild dogs from the KNP and incubated in the "Nil" and "TB Antigen" (TB Ag) tubes of the QuantiFERON®-TB Gold (QFT) system, with pokeweed mitogen (PWM) included as a positive control. Following overnight incubation, plasma was harvested for cytokine measurement. Pooled PWM-stimulated samples were used to compare the sensitivities of three commercial IFN-γ ELISA kits. The IFN-γ concentration in plasma harvested from the Nil and TB Ag tubes was measured using the selected ELISA and compared using a student's t-test. A provisional cut-off was calculated as the mean of the QFT Nil stimulation + 2 standard deviations (mean + 2SD). Samples harvested from the TB Ag tube were categorized as "positive" or "negative" if they were greater than this value. The R&D kit displayed the greatest sensitivity for detection of IFN-γ in PWM-stimulated blood and was used to measure antigen-specific IFN-γ release in QFT-processed samples. There was a significant difference in IFN-γ release in the QFT Nil and TB Ag tubes and a provisional cut-off of 197 pg/ml was calculated, with 61% of the animals testing positive. The R&D kit, in conjunction with the QFT system, is useful for the detection of antigen-specific IFN-γ in M. bovis-exposed wild dogs. This IGRA shows promise as a diagnostic tool for use in African wild dogs; however, further analysis of test performance is needed.

ABSTRACT NUMBER / ABSTRAKNOMMER: 2

A CROSS-SECTIONAL ANALYSIS OF PERINATALLY HIV-INFECTED (PHIV) ADOLESCENTS IN A PEDIATRIC INFECTIOUS DISEASES CLINIC IN THE WESTERN CAPE.

LINDA VAN HEERDEN* (UNIVERSITY OF STELLENBOSCH)

Background: Approximately 2 million adolescents were living globally with HIV in 2014. HIV is the leading cause of death in adolescents in Africa and the second leading cause of death for adolescents worldwide. PHIV adolescents often have chronic complications due to late access to ART and ART side effects. The aim of this study was to describe a cohort of PHIV adolescents attending Tygerberg Hospital in 2015. Material and Methods: A retrospective descriptive study describing all HIV- infected adolescents (10 to 19 years) attending the Infectious Diseases Clinic (IDC) at Tygerberg Hospital during 2015. Results: 98/ 400 (25%) patients were adolescents, of which 55/98 (56%) were female. Median age at first clinic visit was 4.9 years (IQR 1.5-9.4). Median age at most recent clinic visit was 14 years (IQR 10-19). The majority of adolescents were WHO stage 3 and 4 at diagnosis (74%). 28/98 (29%) were on their original ART regimen with no switch in drug for side effects or failure. 67/98 (68%) remained on their first regimen with a single drug switch due to side effects. 81% (76/94) were virologically supressed. The most common chronic complications were dermatological (80%), neurological (42%) and chronic lung disease (23%) with 59% having had previous TB. The

median number of hospitalizations since diagnosis was 3 (1-4). No deaths were recorded in 2015. 68% (67/98) were fully disclosed to with no documentation of disclosure in 20%. 55% (54/98) attended mainstream school and 34% (34/98) a special school. 33% (32/98) failed more than one grade. 5% (5/98) were on antidepressants and 57% (56/98) had been referred to a social worker for psychosocial issues. Conclusions: Despite late access to ART, adolescents had good outcomes. Fewer chronic complications were noted than in other African cohorts. Significant psychosocial issues exist requiring more focused interventions.

ABSTRACT NUMBER / ABSTRAKNOMMER: 3

CHARACTERISATION OF COLISTIN RESISTANCE MECHANISMS IN ENTEROBACTERIACEAE ISOLATES FROM TYGERBERG HOSPITAL LABORATORY.

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Background: Colistin is a last resort antibiotic for the treatment of carbapenem-resistant Gram negative infections. Recently a novel plasmid-mediated colistin resistance mechanism, encoded by the mcr-1 gene, was identified, and has since been detected worldwide. The mcr-1 colistin resistance mechanism is a major threat because of its ability to transfer between strains and species. The aim of this study was to determine the prevalence of the mcr-1 gene in colistin-resistant Enterobacteriaceae isolates in the Western Cape of South Africa; and whether colistin resistance is spread through clonal expansion. Methods: Colistin resistant Escherichia coli and Klebsiella species were isolated from specimens received from different hospitals in the Western Cape that utilise the NHLS microbiology diagnostic laboratory, at Tygerberg Hospital. Species identification and antibiotic susceptibility testing was done using the API 20E and Vitek 2 Advanced Expert System™. PCR was used to detect the plasmid-mediated mcr-1 colistin resistance gene and REP-PCR was used for strain typing of the isolates. Results: Nineteen colistin resistant isolates, including 12 E. coli, six K. pneumoniae and one K. oxytoca isolate, were detected over seven months from different hospitals in the Western Cape region. The mcr-1 gene was detected in 83% of isolates and these strains were found to be unrelated. Discussion and conclusions: The plasmid-mediated mcr-1 colistin resistance gene is responsible for the majority of colistin resistance in clinical isolates of E. coli and Klebsiella species from the Western Cape of South Africa. Colistin resistance is not clonally disseminated; the mcr-1 gene has been acquired by unrelated strains of E. coli and K. pneumoniae. Acquisition of mcr-1 by cephalosporin- and carbapenem-resistant Gram negative bacteria may result in untreatable infections and increased mortality. Measures need to be implemented to control the use of colistin in health care facilities and in agriculture to retain its antimicrobial efficacy.

ABSTRACT NUMBER/ ABSTRAKNOMMER: 4

CORONAVIRUS DIVERSITY IN THE SOUTH AFRICAN NEOROMICIA CAPENSIS BAT.

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Emerging infectious diseases pose a threat to public health, and bats are recognised as reservoir hosts for many important viruses with zoonotic potential, such as coronaviruses (CoV). Several members of the alpha- and betaCoV genera are commonly associated with mild disease in humans. However, in 2002 and 2012, outbreaks of severe respiratory disease led to the identification of highly pathogenic novel human betaCoV, Severe Acute Respiratory Syndrome- (SARS-) and Middle Eastern Respiratory Syndrome- (MERS-) CoV, respectively. In a recent study by our group, a beta- and twelve alphaCoV sequences were detected in South African Neoromicia capensis bats. The betaCoV was found to belong to the same CoV species as the highly pathogenic MERS-CoV. Despite the wealth of

evidence supporting camels as the zoonotic source of human MERS index cases, little is known about the role of bats as putative ancestral hosts to MERS-CoV. With its vast distribution across Sub-Saharan Africa, N. capensis may play a role in the distribution of this CoV. To assess the diversity of CoV within N. capensis, 196 faecal pellet samples were collected across different regions of South Africa and screened for the presence of CoV using PCR assays with primers targeting conserved regions of the CoV RNA-dependent RNA polymerase gene. Three different CoV species were detected: two novel alphaCoV provisionally termed Neoromicia bat CoV (NBtCoV) 1 and 2, and a MERS-related betaCoV. The overall CoV prevalence in N. capensis bats was 56% with an estimated prevalence of 34.5%, 2.4%, and 31.0% for NBtCoV1, NBtCoV2, and MERS-CoV, respectively. Additionally, coinfection with NBtCoV1 and MERS-CoV was detected in 10 individual bats, indicating the potential for recombination. This could lead to the emergence of a novel CoV with new characteristics that might make it a candidate for zoonotic transmission to other mammals including human beings.

ABSTRACT NUMBER / ABSTRAKNOMMER: 5

DETECTION OF INDUCIBLE HIV IN CHILDREN ON ART DESPITE LOW HIV-1 DNA.

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In early treated HIV-infected children, it is unknown whether the few HIV infected cells that persist on long-term ART harbor proviruses capable of virion production. This study evaluated how often HIV is inducible from CD4+ T lymphocytes. PBMC samples were analyzed from Post-CHER participants who began ART at <1 year of age and sustained suppression through to age 7-8. Total HIV-1 DNA in PBMC was quantified by qPCR targeting a conserved region in integrase. Total inducible virus recovery (TVR) assays were performed on purified CD4+ T cells stimulated with PMA and ionomycin for 7 days. Virus outgrowth assays (VOA) were performed with purified CD4+ T cells, activated with phytohemagglutinin and co-cultured for 28 days with irradiated HIV-1 negative feeder cells and CD8-depleted blasts. Supernatants were collected on day 8 for the TVR assay and days 7, 14, 21 and 28 for VOA. HIV-1 RNA was measured in culture supernatants using a HIV-1 PCR assay targeting integrase (iSCA) with single-copy sensitivity. VOA supernatants were also assayed for p24 antigen by EIA. Samples from 10 children were studied after 7-8 years of suppression. Five participants had pre-ART HIV RNA >750,000 copies/ml and 5 had a median pre-ART HIV RNA of 635,000 copies/ml. Median cell associated HIV-1 DNA was 38 copies per million cells (range: 4.5-186). Two of 10 children had inducible HIV-1 RNA by TVR assay detected by iSCA at 2267 and 24 copies/ml, respectively. All VOA supernatants collected were negative for p24 antigen, but 4 participants had detectable HIV-1 RNA at day 21. Children initiated on ART early did not have infectious virus that could be readily isolated in VOAs. However, inducible virion production was detected in 4 children using a sensitive HIV-1 RNA assay. This assay may be a sensitive biomarker for virion production in latent HIV reservoirs from children.

ABSTRACT NUMBER / ABSTRAKNOMMER: 6

EXOME SEQUENCING IDENTIFIES A NOVEL MAP3K14 MUTATION IN RECESSIVE ATYPICAL COMBINED IMMUNODEFICIENCY.

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Although approximately 33% of the world's population is infected with M.tuberculosis, the causative agent of tuberculosis (TB), only 10% of infected individuals will develop active disease. While the genotype of invading strains and environmental factors are crucial in disease outcome, host genetic factors can be decisive. Several investigations have successfully identified genes involved in TB susceptibility. Nevertheless, it is certain that more susceptibility genes exist, but identifying them in a complex disease such as TB is challenging. Answers may lie in the genomes of individuals suffering from a group of inherited primary immunodeficiency disorders (PIDs) for which multiple M.tuberculosis infections is a common feature. We hypothesize that the genes involved in these PIDs could be good candidate genes to investigate for increased TB susceptibility in the general population. We aimed to identify novel TB susceptibility genes by finding gene mutations in patients suffering from PIDs characterized by increased TB susceptibility. The exomes of one PID patient and her two healthy parents were sequenced using the Illumina HiSeq. Bioinformatic techniques were used to identify a large number of variations from the reference human genome for the patient. The genes were prioritized based on OMIM and HGMD database entries to result in the identification of one new putative disease-causing variant situated in a novel TB susceptibility gene namely MAP3K14. This variant was absent from ethnically matched controls, and was predicted to be deleterious and disease-causing by several in silico prediction tools. Over-expression models were used to functionally prove that the variant identified in MAP3K14 decreases the kinase activity of this protein, and thus result in significantly decreased nuclear factor-kappa B (NF-κB) signalling. The identification of disease-causing mutations can provide us with novel candidate genes to screen for TB susceptibility in the general population, and also aid in correctly treating affected patients.

ABSTRACT NUMBER / ABSTRAKNOMMER: 7

PREVALENCE OF CHRONIC HEPATITIS B IN A COMMUNITY-BASED COHORT ATTENDING OCCUPATIONAL HEALTHCARE CLINICS IN THE WESTERN CAPE PROVINCE, SOUTH AFRICA.

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Background: The prevalence of chronic hepatitis B infections (CHB) in the general South African population is unknown. This study aimed to determine the prevalence of CHB in a community-based cohort using a point-of-care test (POCT) and to evaluate the test's acceptability to the study population. Material/methods: Individuals attending occupational healthcare clinics in the Western Cape were recruited following informed consent from April 2016 to February 2017. HBV screening was performed using the Alere Determine™ HBsAg POCT. All positive and a proportion of negative results were confirmed by serological testing on the Abbott ARCHITECT i2000SR system. HB viral load testing was performed using an automated Roche COBAS® AmpliPrep Instrument. An evaluation

questionnaire on HBV POC testing was administered to a sample of approached individuals. Results: Of 960 individuals (median age: 35 [range: 19-72 years]) enrolled, 21 (17 men and 4 women) tested positive for HBsAg on the POCT and were confirmed positive by laboratory testing (2.2%, 95% CI 1.4%–3.3%). Median viral load was 169 IU/ml (range: < 20–469 000 IU/ml). Three patients were co-infected with HIV. One mono-infected patient reached treatment threshold according to current guidelines. She was reviewed by a gastroenterologist and tenofovir treatment was initiated. All patient contacts were offered follow-up; the contacts of eight patients were tested and none were positive for active HBV. 81 negative POCT results were confirmed negative on laboratory-testing. 194 people completed the evaluation questionnaire, of whom 15 refused testing (92% acceptance rate). Only 30.4% had heard of HBV previously. Conclusions: The HBV prevalence in this community-based cohort was 2.2% which is consistent with a study conducted in pregnant women at Tygerberg Hospital. The POCT showed 100% specificity and sensitivity in the present study and was well accepted by the tested population. However, knowledge of HBV infection is low and needs to be addressed.

ABSTRACT NUMBER / ABSTRAKNOMMER: 8

SYSTEMATIC REVIEW: COMMERCIAL PRODUCTS FOR PRESERVING CLINICAL SPECIMENS FOR THE DIAGNOSIS OF TUBERCULOSIS OR DRUG-RESISTANT TUBERCULOSIS (TB).

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Many countries are scaling-up tests for TB. This may require transporting specimens from the point-of-collection to central facilities under conditions unfavourable for specimen integrity. There is limited evidence that Mycobacterium tuberculosis (MTB) culturability or DNA integrity declines sufficiently under ambient conditions and transport durations to negatively affect test performance. Products for preserving specimens could prevent specimen degradation and improve the performance of downstream tests; however, the evidence to support their use has never been systematically reviewed. As part of a World Health Organization consultation process, we did a systematic review to summarize the performance of different commercial products for (1) preserving the culturability of MTB and (2) improving the detection of mycobacterial DNA by nucleic acid amplification tests (NAATs). Literature searches identified the following products: OMNIgene•SPUTUM (OMS), PrimeStore MTM (PS-MTM), FTA card and GENO•CARD. A total of fourteen studies including technical studies, clinical studies or a combination of these study types were selected. Technical studies demonstrated PS-MTM to render high concentrations of MTB non-culturable. PS-MTM was compatible with Xpert MTB/RIF (Xpert) and PrimeMixTB. FTA card and GenoCard did not render MTB non-culturable, yet were compatible with MTBDRplus. Three clinical studies indicated that OMS-treatment improved contamination rates. Nine studies showed the addition of OMS or PS-MTM added to specimens under ambient conditions resulted in performance similar to that of untreated specimens transported by cold-chain. However, we found mixed (culture) or no (Xpert) evidence that a cold-chain itself improved performance over ambient conditions. Few studies included a comparison of testing strategies where the impact of the product alone could be discerned. Overall, there is limited evidence that, when part of a testing strategy involving culture (OMS) or NAATs (OMS, PS-MTM, FTA Card, GenoCard), transport products result in downstream test performance comparable to specimens transported using a cold-chain.

ABSTRACT NUMBER / ABSTRAKNOMMER: 9

INFECTIOUS UVEITIS IN HIV-POSITIVE AND HIV-NEGATIVE PATIENTS IN SOUTH AFRICA.

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Purpose: To evaluate causes of infectious uveitis in HIV-positive and HIV-negative patients in South-Africa using polymerase chain reaction (PCR) and Goldmann-Witmer coefficient (GWC) calculation. Design: Prospective cross-sectional study Methods: In addition to routine baseline investigations for uveitis, aqueous humor (AH) samples from 100 consecutive uveitis patients were investigated by multiplex PCR for herpesviruses 1 – 6, rubella virus (RV) and Toxoplasma gondii (Toxo). Additionally, paired AH and serum samples from 82 patients in the same cohort were examined for intraocular antibody production against herpes simplex virus (HSV), varicella-zoster virus (VZV), cytomegalovirus (CMV), RV and Toxo. Results: Samples tested: Positive results were obtained in 37 of 182 samples (20.3%): 19 (51.4%) from HIV+ and 18 (48.6%) from HIV- patients. In the HIV+ group, 13 samples (68.4%) were PCR+ and 6 samples (31.6%) GWC+ while in the HIV- group 10 samples (55.6%) were PCR+ and 8 samples (44.4%) GWC+. Patients tested: Thirty-seven positive samples originated from 27 patients with >1 pathogen identified in 9 patients, 7 (77.7%) of whom were HIV+. Patients with intermediate-, posterior- and panuveitis were more likely to be HIV+ (p=0.005). Fourteen of 15 HIV+ cases had a final diagnosis of infectious uveitis (1=idiopathic, 3=CMV, 4=VZV, 1=HSV, 1=poststreptococcal, 3=syphilis, 1= HIV-induced, 1=Toxo) while 10 of 12 HIV- cases had infectious uveitis (1=idiopathic, 1=HLAB27, 2=CMV, 3=VZV, 3=RV, 2=possible ocular TB). In 9 of 11 EBV PCR+ cases (81.8%) an alternative cause of inflammation was identified (p=0.001). Anatomically, all cases with herpetic non-anterior uveitis were PCR+ GWC- while all cases with herpetic anterior uveitis were GWC+ PCR-. Conclusions: Causes of uveitis differ in HIV+ and HIV- patients. Multiple infections occur mostly in HIV+ patients where PCR is more often positive than GWC. Regardless of HIV status, EBV PCR+ patients are likely to have an alternative cause of uveitis.

ABSTRACT NUMBER / ABSTRAKNOMMER: 10

INVESTIGATING THE AGR TYPE AND AGR FUNCTIONALITY OF STAPHYLOCOCCUS AUREUS ISOLATES FROM BACTERAEMIC PATIENTS AT TYGERBERG HOSPITAL.

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Background: Staphylococcus aureus is highly virulent and causes infections ranging from mild to life-threatening. The accessory gene regulator (agr) locus is a quorum sensing gene cluster that regulates expression of more than 70 genes, including 23 virulence factors. Sequence variation within the agr locus results in four different agr-types. The agr locus may be dysfunctional in some isolates; this, together with agr-type results in different disease phenotypes. Strains with dysfunctional agr loci may respond negatively to treatment. We aimed to determine the genetic relatedness, agr-type and agr functionality/dysfunctionality of S. aureus isolates from blood cultures from patients at Tygerberg Hospital. Methods: Seventy-two S. aureus isolates were collected from blood cultures from adult patients, from February 2015 to January 2016. spa typing was performed to assess genetic diversity. Related spa-types were clustered into spa-clonal-complexes (spa-CCs) using a based upon repeat pattern (BURP) algorithm. The agr-type and agr functionality were determined by multiplex PCR and phenotypic δ-haemolysin assay, respectively. Results: Fourteen (19%) isolates were methicillin resistant S. aureus (MRSA). Thirty-six different spa-types were identified, and clustered into 7 spa-

CCs. The commonest spa-type was t318 (10%), and the commonest spa-CC was spa-CC 021 (23%). The dominant agr-type was agr-type I (55%) and 10 (13,9%) isolates were agr dysfunctional with agr-type III being most common among the dysfunctional strains (60%). Majority of the spa-CCs were associated with a single agr-type and MRSA proved to be more clonal than MSSA. Discussion and Conclusion: Although the majority of the spa-CCs were associated with a single agr-type, exceptions were identified, implying that interstrain recombination may result in the presence of more than one agr-type within a clonal complex. The results of this study will be used in further investigations into the mechanisms and role of the agr locus in S. aureus physiology and virulence and clinical disease.

ABSTRACT NUMBER / ABSTRAKNOMMER: 11

INVESTIGATING THE POTENTIAL ANTI-MYCOBACTERIAL EFFECT OF NOVEL POLYCYCLIC COMPOUNDS ON MYCOBACTERIUM TUBERCULOSIS.

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The treatment for the tuberculosis (TB) causative bacterium, Mycobacterium tuberculosis, consists of a lengthy regimen with multiple antimycobacterial drugs. M. tuberculosis has developed drug resistance to most of the existing antimycobacterial drugs. To aid in the shortening of the current regimen and combatting drug resistance it is essential to identify novel antimycobacterial compounds. During this study 101 novel polycyclic compounds have been screened against M. tuberculosis H37Rv. Subsequent validation and minimum inhibitory concentration determination using two different methods identified five compounds with antimycobacterial activity, one of which displays MIC values in the range of two first-line antimycobacterial drugs, isoniazid and ethambutol. Cytotoxicity analysis was favourable for all of these 5 compounds. Experiments to determine the intracellular activity of the top 5 compounds within macrophages are currently being undertaken. Further analysis includes the elucidation of drug-resistance causing mechanisms of the most active compound, by employing whole genome sequencing analysis,. Comparative whole genome sequence analysis of the susceptible progenitor M. tuberculosis H37Rv and spontaneously generated mutants resistant to the most active compound may reveal possible drug resistant causing single nucleotide polymorphisms, insertions or deletions within the genome. This will help to identify the target of the compound. In future work, the scaffolds and side-chains of the four compounds which have shown antimycobacterial activity at higher concentrations could be adapted in the hopes to make the compounds more active. The compound which has shown antimycobacterial activity on par with two first-line drugs could enter the drug development pipeline as a hit-to-lead possibility.

ABSTRACT NUMBER / ABSTRAKNOMMER: 12

NO EVIDENCE OF ONGOING HIV REPLICATION IN CHILDREN AFTER 7 YEARS ON ART

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Although a long-term study of clinically-effective ART showed no evidence of HIV evolution in 13 of 14 adults (Kearney, 2014), a recent study (Lorenzo-Redondo, 2016) of 3 persons concluded that HIV evolution occurs on ART at a rate of 6 x 10-4 to 1 x10-3 mutations/site/month due to ongoing viral replication in the lymph nodes with subsequent trafficking of newly infected T-cells to blood. It remains controversial whether current antiretroviral therapy (ART) fully suppresses cycles of HIV replication and viral evolution in vivo. To investigate this question, we analyzed HIV populations in longitudinal samples from 10 HIV-1-infected children who were initiated on continuous ART as part of the CHER study. Samples obtained near ART initiation and after 7 years of ART underwent single-genome sequencing of the p6-PR-RT region of HIV. Sequences from each time point were compared for evidence of evolution by multiple, sensitive methods: 1) calculation of average pairwise distance (APD) for sequence diversification, 2) panmixia testing for sequence divergence, and 3) construction of maximum-likelihood (ML) trees to measure root-to-tip distances for emerging new variants. Eight children started ART at ≤10 months of age and had plasma viremia suppressed for 7-9 years. Two children had uncontrolled viremia for 15 and 30 months respectively before viremia suppression. The latter two children showed clear evidence of virus evolution, whereas none of the 8 children suppressed on ART showed virus evolution by multiple methods of analysis. Phylogenetic trees simulated with the recently reported evolutionary rate on ART of 6 x 10-4 substitutions/site/month bore no resemblance to observed data. Taken together, these data refute the concept that ongoing HIV replication is common on ART and is the major barrier to curing HIV-1 infection.

ABSTRACT NUMBER / ABSTRAKNOMMER: 13

PERCUTANEOUS PERICARDIOSCOPY IN A POPULATION WITH A HIGH PREVALENCE OF TUBERCULOUS PERICARDITIS (TBP): THE POTENTIAL VALUE OF MYCOBACTERIAL DNA AMPLIFICATION IN ESTABLISHING AN EARLY DEFINITE DIAGNOSIS

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Background: Establishing a rapid definite diagnosis of tuberculous pericarditis remains challenging. Microscopy of pericardial fluid for acid-fast bacilli (AFB's) is insensitive. Laboratory confirmation remains dependent on Mycobacterium tuberculosis (MTB) culture, which is slow, expensive and insensitive. While the GeneXpert MTB/RIF assay has been well evaluated for pulmonary TB, its use in extrapulmonary TB, and especially pericardial TB, is less well documented. Objective: To describe the performance of the GeneXpert MTB/RIF assay for detection of MTB in pericardial samples, and to compare the yield of the assay on pericardial fluid and tissue specimens. Methods: Patients with a large pericardial effusion were offered inclusion. After standard pericardiocentesis they underwent percutaneous pericardioscopy and pericardial biopsy. The evaluation of pericardial fluid specimens included: biochemistry, GeneXpert MTB/RIF, microscopy and TB culture. Tissue specimens were evaluated by microscopy, TB culture, GeneXpert MTB/RIF, and histology. Results: Of 16 participants, 9 were HIV-positive. Pericardioscopy was possible in 13 and biopsy was achieved in 11. 14 were diagnosed with definite TBP, 13 of these were MTB culture positive. Mean time to culture positivity was 18 days (14 to 40 days). An alternative diagnosis was established in 2; 1 scleroderma serositis, 1 malignant effusion. Of the 14 with definite TBP, 8 were GeneXpert positive on pericardial fluid and 4 on tissue, with 1 resistant to rifampicin. A single fluid specimen and 3 tissue samples were AFB positive on microscopy. 9 fluid and 10 tissue specimens cultured positive for MTB. Conclusions: GeneXpert MTB/RIF evaluation of pericardial fluid and tissue allowed for a more rapid diagnosis of definite TBP, compared to culture. Its additional advantage is the ability to rapidly confirm rifampicin resistance. Although microscopy also allows for an immediate diagnosis, its yield is low. Current

results suggest that the performance of GeneXpert MTB/RIF may be better on pericardial fluid than tissue.

ABSTRACT NUMBER / ABSTRAKNOMMER: 14

PHARMACOKINETICS OF RIFAMPIN AND ISONIAZID DURING PREGNANCY AND POSTPARTUM IN SOUTH AFRICAN WOMEN.

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Physiological changes during pregnancy may alter drug pharmacokinetics. Trimester differences in rifampin (RMP) and isoniazid (INH) exposure have not been described. We explored the effects of pregnancy gestation on RMP and INH pharmacokinetics in tuberculosis-infected women. P1026s is an ongoing, non-blinded, phase IV, prospective study of antiretroviral and antituberculosis pharmacokinetics in HIV-infected and uninfected pregnant women. Intensive steady-state 24-hour pharmacokinetic profiles of RMP and INH were performed during 2nd (2T) and 3rd trimester (3T) and postpartum (PP). Daily antituberculosis fixed-dose combination tablets were given according to WHO-recommended weight-banded dosing guidelines. RMP and INH plasma concentrations were measured using High Performance Liquid Chromatography (HPLC); detection limits being 0.117 µg/ml and 0.098 µg/ml, respectively. The pharmacokinetic parameters were characterized using noncompartmental analysis and compared to published non-pregnant South African adult data. Preliminary data are available for 10 South African participants; 7 African, 2 mixed descent and 1 Indian. Eight women were HIV-infected (7 on efavirenz and 1 on lopinavir/ritonavir). The median age at 3T was 31 years (range 21-40) and median weight at 3T was 58.6 kg (range 49-99). Median gestational age at delivery was 38 weeks (range 36-41). RMP and INH pharmacokinetic data were available in 5, 8 and 3 women in 2T, 3T and PP. See Tables 1 and 2 respectively. Compared to a non-pregnant South African adult cohort (45% male, 10% HIV-infected not receiving antiretrovirals, McIlleron et al. 2006), RMP exposure was similar or higher in 2T and 3T. INH exposure was below the 25th percentile across all stages of pregnancy. Small sample size and unavailable comparator raw dataset prohibited formal statistical testing. RMP concentrations in pregnancy compared well to non-pregnant concentrations. However, INH exposure was reduced throughout pregnancy. If confirmed with larger sample size, these data suggest that an increased dose of INH may be needed during pregnancy.

ABSTRACT NUMBER / ABSTRAKNOMMER: 15

RAPID DECLINE OF TOTAL HIV DNA IN CHILDREN STARTING ART WITHIN 8 DAYS OF BIRTH.

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Early infant antiretroviral therapy (ART) reduces HIV-1 infected and transcriptionally active cells (van Zyl, JID 2015). In the case of the Mississippi baby, ART initiated shortly after birth, resulted in delayed viral rebound after therapy interruption, probably due to a very small pool of infected cells. However, there is limited data related to very early ART initiation from resource limited settings. Eleven children diagnosed through a public health sector birth diagnosis program were initiated on ART within 8 days of birth (median 3 days). Peripheral blood mononuclear cells (PBMCs) and plasma were processed at 3 monthly visits. HIV-1 total DNA was measured with a sensitive quantitative PCR assay (Hong, JCM 2016) targeting a conserved region in HIV-1 integrase (limit of detection 3 copies/million cells). Plasma HIV-1 RNA was quantified by Roche COBAS®AmpliPrep/COBAS® TaqMan® HIV-1 v2. The initial ART regimen consisted of AZT/3TC/NVP, with NVP replaced by LPV/r after 2 weeks of age. Median baseline plasma HIV-1 RNA was 4.0 (range 2.4-4.7) log10 copies/ml. One child had ongoing viremia. All other children achieved plasma HIV-1 RNA <100 copies/ml after a median of 4 months, but two had subsequent single viremic episodes. Four children had no detectable HIV-1 DNA when first sampled at 9 days, 3.8 months, 4.9 months and 8.2 months after ART. In the other 6 children, excluding the child with ongoing viremia, there was a progressive decline in HIV-1 DNA with 4 of 6 reaching <10 copies per million cells within 13 months of ART initiation. Early ART initiation within a few days of birth can suppress viral replication, limit the initial number of HIV infected cells and result in their subsequent decay to undetectable levels. However, this rapid decay and limited sample amount require more robust molecular diagnostics to prevent misdiagnosis of HIV infection in uninfected children.

ABSTRACT NUMBER / ABSTRAKNOMMER: 16

USE OF THE QUANTIFERON® TB-GOLD (IN TUBE) SYSTEM TO DETECT *MYCOBACTERIUM BOVIS* INFECTION IN WARTHOGS (*PHACOCHOERUS AFRICANUS*).

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Background: Bovine tuberculosis (bTB) is the result of an infection with Mycobacterium bovis (M. bovis), and has been reported in many species including suids. Wild suids are important maintenance hosts of bTB in the Eurasian ecosystem. Recent studies have shown that warthogs in South Africa have a high risk of M. bovis infection in endemic areas. Therefore, warthogs may serve as potential disease reservoirs. Our aim was to develop novel assays based on antigen-specific cell-mediated immune (CMI) responses for detection of M. bovis infection in warthogs. Materials and Methods: Heparinized whole blood from M. bovis-infected and –uninfected warthogs were stimulated in the QuantiFERON® –TB Gold (In Tube) system. The plasma fraction was harvested as well as mRNA extracted from the remaining cell pellet. These were used to detect antigen-specific CMI responses. Cytokine ELISAs for interferon gamma (IFN-γ) and interferon gamma-induced protein 10 (IP-10) were developed using commercially available antibodies. Additionally, antigen-specific expression of the cytokine genes IFN-γ, CXCL9, CXCL10, CXCL11 and TNF-α, was measured using novel real-time quantitative polymerase chain reactions. Results: Despite screening various combinations of commercial antibodies, no IFN-γ was detected in stimulated plasma. However, the IP-10 ELISA was able to distinguish between M. bovis-infected and uninfected warthogs. Assay sensitivity was 68% (13/19; 95% CI = 46-85%) and specificity 84% (41/49; 95% CI = 71-91%) when compared to mycobacterial culture. Preliminary data from the GEA show significant upregulation of CXCL10, the gene for IP-10, and detectable upregulation of IFN-γ. However, there was no significant difference in IFN-γ upregulation between infected and uninfected warthogs. Conclusion: Our data suggest that IP-10 is a potential diagnostic biomarker for M. bovis infection in warthogs, using cytokine ELISA or gene expression assay.

ABSTRACT NUMBER / ABSTRAKNOMMER: 17

B-LACTAM RESISTANCE MECHANISMS IN ENTEROBACTER SPP. ISOLATES FROM TYGERBERG HOSPITAL.

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Background Resistance to carbapenems and cephalosporins among Enterobacteriaceae is a global concern. Carbapenem resistance is mainly due to carbapenemases production or impermeability; however hyperproduction of chromosomal AmpC enzymes, extended spectrum β-lactamases (ESBLs) and overexpression of efflux pump systems may play a role. Aim To describe β-lactam resistance mechanisms in Enterobacter spp. isolates from Tygerberg Hospital. Methodology A total of 38 cephalosporin resistant Enterobacter spp. isolates from routine clinical samples (including 25 with reduced ertapenem susceptibility) were included. Ertapenem MICs determined by gradient diffusion were compared to results from the VITEK® 2 automated system. Disc diffusion assays were performed to detect ESBLs and AmpC. Multiplex PCR was used to detect TEM, SHV and CTX-M related ESBL genes and common carbapenemase genes. A colorimetric test screened for carbapenemase production. Outer membrane proteins were analysed in 30 E. cloacae isolates using SDS PAGE and mass spectrometry. Results 8 isolates were ertapenem non-susceptible by gradient diffusion compared to the 25 isolates identified by VITEK® 2. Potential ESBLs were detected in 28 (73.7%) isolates by PCR, 18 (47.4%) isolates by disc diffusion and 3 (7.9%) isolates by the VITEK® 2. AmpC enzymes were detected in 18 (47.37%) isolates by disc diffusion, and 2 (5.3%) isolates by the VITEK® 2 automated system. Two isolates were positive by the carbapenemase colorimetric assay but negative by PCR. Protein bands were identified as OmpF (38.8kDa) and OmpC (41.18kDa). These bands were present in only 22 (73.3%) isolates, with faint or no bands in 8 (26.7%) isolates. Conclusion Carbapenemase production in two PCR negative isolates suggests an alternative carbapenemase type. Other mechanisms must account for carbapenem resistance in the majority of isolates; these may be related to outer membrane proteins, and / or overexpression of AmpC enzymes and efflux pump systems. These aspects remain to be investigated.

POSTERS/PLAKKATE

ABSTRACT NUMBER / ABSTRAKNOMMER: 18

THE EFFECT OF TB INFECTION ON FAT ACCUMULATION AND ADIPOCYTE GENE EXPRESSION.

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Weight loss is considered as one of the main symptoms in patients with active tuberculosis. Adipocytes play a pivotal role in whole-body energy homoeostasis. The process by which pre-adipocytes convert to mature adipocytes is termed fat accumulation or adipogenesis. Cellular fat accumulation or adipogenesis is a complicated process that occurs in response to insulin and other metabolic processes. In this study, we have examined the effect of Mycobacterium tuberculosis strain H37Rv on fat accumulation and adipocyte related gene expression. 3T3-L1 cells were grown until they reached confluence, differentiation media was added in the presence or absence of H37Rv. Infection of adipocytes with M. tuberculosis H37Rv was performed at three different multiplicity of infections

(MOI 1, 2 and 5). We have used three ways to detected cellular fat accumulation in 3T3-L1 cells, and these are Oil Red staining, triglyceride content and ALP activity. We observed a significant decrease in fat accumulation ($P<0.05$), ALP activity ($P<0.01$) and TG content ($P<0.05$) between infected and non-infected cells, and only a slight decrease in these parameters at MOI 2. Using PCR we examined the effect of the treatment on PPAR-γ, C/EBPs, Adiponectin, IRS-1 and IRS-2, ALP and CD36. A change in gene expression was only observed at MOI 5 exhibiting a strong decrease of genes that control cellular fat accumulation (i.e.: C/EBPα, ALP, CD36) and genes associated with cellular insulin sensitivity (i.e. IRS1, and Adiponectin). The complete inhibition of cellular fat accumulation at MOI 5 may explain the weight loss that is observed in patients with TB at a late stage of the disease.

ABSTRACT NUMBER / ABSTRAKNOMMER: 19

THE IDENTIFICATION OF NOVEL PROTEINS INVOLVED IN IRON-SULPHUR CLUSTER BIOGENESIS IN MYCOBACTERIA.

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Mycobacterium tuberculosis remains one of the world's deadliest pathogens, and although decades of research have been dedicated to the discovery and development of anti-tuberculosis agents and vaccines, tuberculosis (TB) remains an ongoing global public health threat. Given the emergence of drug resistance and the poor treatment outcomes associated with this disease, it is imperative that we improve our understanding of the pathogenesis of M. tuberculosis, in order to develop new anti-TB drugs and strategies for shortening drug treatment. Iron-sulphur (Fe-S) clusters are ubiquitous cofactors that are required for the maturation of various proteins, many of which are involved in essential biological processes. Multiprotein complexes are required for the in vivo assembly of Fe-S clusters, and the SUF system, encoded by the Rv1460-Rv1461-Rv1462-Rv1463-csd-Rv1465-Rv1466 operon in M. tuberculosis, is thought to be the major Fe-S cluster biogenesis machinery in this organism. This process is poorly understood in mycobacteria, and it is currently unclear if proteins outside of this operon are involved in Fe-S cluster biogenesis. In this study, we sought to identify novel proteins involved in Fe-S cluster assembly in mycobacteria. We employed affinity enrichment using nickel-charged magnetic beads and mass spectrometry to identify potential interacting partners for Csd. Strains expressing a 6xHis-tag SufC fusion and a 6xHis-tag mCherry fusion were also included for comparison. Utilising this method, we were able to demonstrate affinity enrichment for Fe-S cluster assembly proteins, and Fe-S cluster-containing enzymes, as well as identify potential novel interacting partners. This work has established the methodology for identifying novel protein-protein interactions in mycobacteria, and lays the foundation for elucidating the process of Fe-S cluster assembly in mycobacteria.

ABSTRACT NUMBER / ABSTRAKNOMMER: 20

INVESTIGATION OF PARKIN-MEDIATED UBIQUITINATION OF MYCOBACTERIUM TUBERCULOSIS USING CONFOCAL MICROSCOPY.

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Human PARK2 encodes an E3 ubiquitin ligase, Parkin, which has a well-established role in mitophagy. However, the function of Parkin in immunity remains relatively unexplored. Upon Mycobacterium tuberculosis (Mtb) infection, the host ubiquitinates bacteria and targets them to the autophagy

process for degradation. Previous electron microscopy studies showed that ubiquitin was in close proximity to phagosomes containing Mtb. In the present study, we aimed to determine whether Parkin and Ubiquitin co-localise with Mtb using confocal microscopy. Wild type and siRNA-treated Parkin-deficient human monocyte-derived macrophages (THP-1 cells) were infected with the Mtb strain, H37Rv-expressing mCherry, for 4 hours followed by incubation with Alexa Fluor-488 and Alexa Fluor-647-labelled antibodies against Parkin and Ubiquitin, respectively. Co-localisation of Parkin and Ubiquitin was observed; this decreased in Parkin-deficient cells, indicating the enzyme's involvement in ubiquitination in THP-1 macrophages. We found increased co-localisation between Ubiquitin and Mtb in wild type cells compared to Parkin-deficient cells but this difference was non-significant (42% ± 0,25 vs. 36% ± 0,13, respectively; p = 0,55).While incomplete Parkin knockdown is undoubtedly partly responsible, the continued association of Ubiquitin with Mtb suggests the contribution of additional E3 ubiquitin ligases to Mtb ubiquitination. In conclusion, we propose that Parkin is responsible for some, but not all, of the co-localisation of Ubiquitin with Mtb. Future studies include identification of the components of the Mtb surface ubiquitinated by Parkin, as well as an investigation of additional E3 ubiquitin ligases involved in Mtb ubiquitination.

ABSTRACT NUMBER / ABSTRAKNOMMER: 21

GENETIC CHARACTERIZATION OF DRUG RESISTANT CLINICAL ISOLATES OF MYCOBACTERIUM TUBERCULOSIS CIRCULATING WITHIN NDOLA DISTRICT; A HIGH HIV PREVALENCE DISTRICT OF ZAMBIA.

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Background and objectives: Efforts to curb TB are hampered by factors including the emergence of drug resistant TB strains and the HIV epidemic. In Zambia, close to 42,000 TB cases were reported in 2015 of which 60% were co-infected with HIV. The burden of MDR-TB in Zambia is 18% for retreatment cases and 1.1% for new cases. The molecular epidemiology and distribution of drug resistant TB cases in Zambia is unknown. This research aims to address the gap in knowledge. The objectives of this research are to characterise the genetics and epidemiology of drug resistant clinical isolates of M. tuberculosis, and to understand the mechanisms driving drug resistant TB within Ndola district, Zambia. Methods: Clinical samples for all confirmed drug resistant TB isolates, demographic and clinical data were captured from TB diagnostic centres in Ndola district, from November 2015 to May 2017. A sample size of 129 was estimated to be representative of the target population. Molecular characterisation is being performed using internationally standardized techniques of spoligotyping, IS6110 DNA fingerprinting, targeted and whole genome sequencing (WGS). Results: Spoligotyping and IS6110 data shows a combination of genetic diversity and clustering of isolates of drug resistant strains. The latter implies that there is ongoing transmission of drug resistant TB in Ndola. Lineage 4 is demonstrated to be predominately associated with drug resistance in the study population. Other genotypes associated with drug resistance were Beijing and CAS. Similarly, WGS findings of selected isolates shows clustering with certain clustered isolates sharing similar resistance-conferring mutations. Conclusion: This study provides the first molecular characterisation of the drug resistant TB epidemic in Zambia, and has demonstrated that drug resistant TB is being transmitted in Ndola district and the surrounding region. A higher-than-expected genotype diversity suggests that acquisition is at least partially driving the MDR-TB burden in Zambia.

ABSTRACT NUMBER / ABSTRAKNOMMER: 22

GENETIC CHARACTERISATION OF THE DASSIE BACILLUS, MYCOBACTERIUM SURICATTAE AND MYCOBACTERIUM MUNGI.

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Background: The Mycobacterium tuberculosis complex (MTBC) comprises several M. tuberculosis (Mtb) strains that infect humans and a wide range of animals. In Southern Africa, M. mungi, M. suricattae and the dassie bacillus infect banded mongooses (Mungos mungo), meerkats (Suricata suricattae) and rock hyraxes (Procavia capensis - dassies), respectively, and are closely related to a human associated lineage, i.e. M. africanum. Aims: To characterize the phylogenetic relationship and genetic diversity of strains of the dassie bacillus, M. suricattae and M. mungi. Material and Methods: Whole genome sequencing was done with a paired-end approach, on an Illumina HiSeq machine. Reads were mapped against the H37Rv reference genome, using Novoalign, SMALT and BWA. Variant and InDel calling was done using GATK, after resorting and indexing with Samtools and Picard. A phylogenetic tree was created with RAxML, based on maximum likelihood. Additionally, DELLY was used to identify larger deletions, which were then further analysed by de novo assemblies and visually inspected in Artemis. Primers were designed accordingly to these deletions and confirmation was done by PCR and Sanger sequencing. Results: Compared to all other MTBC members, M. mungi, M. suricattae, and the dassie bacillus clustered in a single lineage. Of these three strains, the dassie bacillus formed two sub-lineages, one of which is paraphyletic with M. suricattae. Sub-lineages of M. suricattae strains were associated with distinct meerkat social groups. Conclusion: Members of the MTBC occurring in Southern Africa have evolved from a common ancestor and M. suricattae appears to have evolved most recently from the dassie bacillus, possibly following transmission of the organism from dassie to meerkats.

ABSTRACT NUMBER / ABSTRAKNOMMER: 23

AUTOSOMAL DOMINANT IFN-ΓR1 DEFICIENCY PRESENTING WITH BOTH ATYPICAL MYCOBACTERIOSIS AND TUBERCULOSIS IN A BCG-VACCINATED SOUTH AFRICAN PATIENT.

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Mendelian susceptibility to mycobacterial diseases (MSMD) is a group of rare inborn errors of IFN-γ immunity that present as selective susceptibility to weakly pathogenic mycobacteria, including BCG vaccines and environmental mycobacteria. These patients are also prone to TB, which is rarely the only clinical phenotype. Inborn errors of IFN-γ immunity have been reported in patients with TB living in non-endemic or endemic countries, but not from hyper-endemic regions, with persistent, high levels of the disease. We report the first South African case of autosomal dominant partial IFN-γR1 deficiency in a female patient of mixed ethnicity. The patient presented with TB infection for the first time at age 6 months that was responsive to treatment, but no dissemination of BCG from vaccination given at birth. She has had repeated episodes of disseminated Mycobacterium tuberculosis and Mycobacterium avium infections, with symptomatic lesions involving the lungs, liver, brain, long bones, and joints. HIV infection was excluded as a first-line investigation for suspected immunosuppression in a HIV and TB endemic country. On one occasion culture confirmed concomitant infections with two Mycobacteria spp. She continues to experience frequent relapses despite prolonged appropriate therapy for antibiotic-sensitive disease. Poor social circumstances and high cost limit any attempts at adjunctive IFN-γ supplementation. Genetic causes of TB after exclusion of HIV infection, should also be considered in patients living in hyper-endemic regions, especially in cases of co-infection with environmental mycobacteria.

ABSTRACT NUMBER / ABSTRAKNOMMER: 24

FUNCTIONAL COMPARATIVE GENOMICS MYCOBACTERIUM TUBERCULOSIS: IDENTIFYING STRUCTURAL VARIATION OF BIOLOGICAL CONSEQUENCE.

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Mycobacterium tuberculosis, the etiological agent of the disease tuberculosis (TB), is a major burden on public health. The M. tuberculosis complex can be divided into 7 major lineages with multiple sub-lineages and clades which exhibit different virulence phenotypes and transmissibility. These major lineages are distinct from one another based on large genomic structural variants within the genome. This provides an indication that these large polymorphisms may be a driving factor in M. tuberculosis evolution and adaption to an intracellular environment. While these structural variants have been studied from an epidemiological viewpoint, the biological relevance remains as of yet unknown. Here we have identified a deletion spanning PPE38-PPE71 in various circulating M. tuberculosis lineages. This deletion has been shown to influence a subset of PE-PGRS protein secretion. This indicates that these proteins, which are thought to play crucial roles in host-pathogen interaction, may be dispensable for infection. Surprisingly, we observed that in rare cases chromosomal breakpoints can occur within the open reading frames of two distally located genes while simultaneously deleting multiple genes between the breakpoints. This phenomenon can result in the production of a single novel functional protein from two previously distinct proteins. This indicates a previously undocumented mechanism of de novo gene evolution in M. tuberculosis. Here we present experimental evidence, using LC-MS/MS to identify a unique peptide spanning the fusion junction, thus providing the first description of a natural chimeric protein in M. tuberculosis arising directly from complex chromosomal rearrangement. In addition, we present a functional consequence resulting from large structural variation within the M. tuberculosis genome. Collectively our data suggests

previously unknown flexibility in the genome of M. tuberculosis and provides additional understanding to the fundamental processes of lateral bacterial evolution.

ABSTRACT NUMBER / ABSTRAKNOMMER: 25

A BIOBANK TO SUPPORT HIV MALIGNANCY RESEARCH FOR SUB-SAHARAN AFRICA.

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Sub-Saharan Africa (SSA) has one of the highest incidences of HIV infection globally. More people in SSA are living longer owing to increased access to antiretroviral therapy. However, akin to trends in developed countries, HIV-associated cancers are expected to increase in this population. To support translational research in HIV-associated cancers, the National Institutes of Health funded Stellenbosch University to house the state-of-the-art AIDS and Cancer Specimen Resource (ACSR) SSA Regional Biospecimen Repository (SSA RBR) to proactively obtain, manage and process biospecimens and associated clinical data representing both AIDS-defining and non-AIDS-defining cancers. Such biospecimens can be used for coordinated morphological, proteomic and genomic research on HIV-related malignancies. Biospecimens are accessible, through a peer reviewed application process, to African researchers and their international collaborators with ethically approved HIV-related projects, at no cost to the researchers. The SSA RBR is fully integrated within the ACSR, operating according to established policies and standardized operational procedures. The SSA RBR also hosts the AIDS Malignancy Consortium (AMC) biorepository to support AMC clinical trial activities in SSA. It conforms and contributes to evolving policies on biobanking in South Africa, including development of new regulations where none are present, protects and promotes ethical and equitable biobanking policies for society and addresses benefit sharing, informed consent and privacy. A Community Advisory Board that includes representatives from the HIV and cancer communities facilitates public involvement in SSA RBR. The SSA RBR is a resource that offers numerous advantages, including operation under best practices in biorepository management, with quality management in governance, personnel, operations and safety. It offers an opportunity to monitor trends in biospecimen research from an African perspective. Through collaboration with other institutions in SSA, the SSA RBR creates an opportunity to develop unique annotated biospecimen collections to promote multi-institutional collaborative research in the field of HIV-related cancers.

ABSTRACT NUMBER / ABSTRAKNOMMER: 26

HIV-1 POL-PHYLOGENETIC DIVERSITY AND DRUG RESISTANCE MUTATION PROFILE IN TWO DIFFERENT COHORTS (ADULT AND INFANTS) FROM YAOUNDÉ, CAMEROON.

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Background: The aim of this study is to characterize molecular diversity and drug resistance mutation profile analysis of HIV-1 in a cohort of treated naïve patients. Cameroon has witnessed the highest HIV diversity globally with rresistance rates for naïve to treated adults at 3.8% and 3.6% for children. Methods We collected 125 samples from HIV-1 positive patients (55 infants < 6 years of age and 70 adults) from the CSCCD research institute in Yaoundé. The CD4 count ranged between 500-2000

cells/m3 and the HIV-1 viral load between 3000-6000 copies/ml. We targeted the pol Protease (PR), Reverse Transcriptase (RT) and Integrase (IN) regions of HIV-1 for sequencing, through well-established methods. Results For infants, a total of 37/55 (67.3%) samples were amplified for at least one of the HIV-1 pol fragments. These included; 29/55 (52.0%) for the PR, 27/55 (49.0%) for the RT and 28/55 (51.0%) for IN. The most predominant strain was CRF02_AG (n = 17; 63.0%). Other subtypes detected include subtype A (n =3, 11.1%), C (n =2, 7.4%), and F2 (n =2, 7.4%). Only one patient sequence (3.7%) had RAMs against NRTIs- K65R mutation. For adults, we analysed 30 PR and 32 RT genome fragments with the following observed results; HIV-1 subtype G accounts for 56% (n = 18), Subtype A 19% (n = 6), Subtype C and J 9% each (n = 3) and subtype D 6% (n = 2). Three patients had NNRTI drug resistance mutations; V90I and G190R. Discussion Tracking the molecular diversity and resistance patterns will greatly improve clinicalmanagement of HIV-1 patients. Prevention programmes like PMTCT needs to be improved to minimize HIV transmission to infants. The various CRFs are complicating the established treatment regimens. We need to continuously characterise HIV to understand drug resistance and the epidemiology in Cameroon.

ABSTRACT NUMBER / ABSTRAKNOMMER: 27

THE EVALUATION OF A MULTIPLEX-PCR BASED MRSA CLONAL COMPLEX TYPING METHOD.

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Background: Staphylococcus aureus is a common pathogen that causes a range of human diseases. Various molecular typing methods are used to discriminate between S. aureus strains, such as Pulsed Field Gel Electrophoresis (PFGE), spa-typing and Multilocus Sequence Typing (MLST), however these methods are labour intensive, expensive or both. This limits their use in resource limited settings where rapid results are required for outbreak identification and to ensure the rapid implementation of preventative measures. There is thus a need for a rapid yet cost effective method that differentiates between S. aureus strains, particularly MRSA. Aim: To optimise and evaluate a previously described MRSA Clonal Complex Multiplex-PCR (MRSA CC M-PCR) in order to determine its ability to effectively differentiate S. aureus isolates at Tygerberg Hospital, Cape Town. Methods: A total of 87 S. aureus isolates (52 methicillin-susceptible and 35 methicillin-resistant), previously characterised by PFGE, spa-typing, SCCmec and MLST, were selected to provide a representative collection. These isolates had all been obtained from Tygerberg Hospital in Cape Town, South Africa. The MRSA Clonal Complex Multiplex-PCR was optimised and then evaluated using this isolate collection. Simpson's index of diversity was used to calculate the discriminatory power of the Clonal Complex Multiplex-PCR in our sample population, in comparison to those of PFGE, spa-typing and MLST. Results: The Clonal Complex Multiplex-PCR had a discriminatory power of 0.88 for MRSA and 0.9 for MSSA isolates, however it could differentiate between some MRSA strain types (35% relative to PFGE) more effectively than between MSSA (25 % relative to PFGE) strain types. Conclusion: The Clonal Complex Multiplex-PCR is a rapid and cost-effective test, which may be used as a preliminary screening method to rule out outbreak situations, and to select isolates which require further testing, such as spa-typing or PFGE to confirm a suspected outbreak.

ABSTRACT NUMBER / ABSTRAKNOMMER: 28

ELUCIDATION OF STRAIN VARIATION IN CLINICAL MYCOBACTERIUM TUBERCULOSIS ISOLATES USING A PROTEOGENOMIC APPROACH.

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Mycobacterium tuberculosis can be considered as the most successful bacterial pathogen in human history and is the causative agent of tuberculosis (TB), a chronic granulomatous lung disease. M. tuberculosis consists of a large number of different strains that display unique virulence characteristics. Whole-genome sequencing has revealed substantial genetic diversity among clinical M. tuberculosis isolates and elucidating the phenotypic variation encoded by this genetic diversity will be of utmost importance to fully understand the biology and pathogenicity of M. tuberculosis. In this study we integrated whole-genome sequencing and mass spectrometry (GeLC-MS/MS) to reveal strain-specific characteristics in the proteomes of two clinical M. tuberculosis isolates. Using this approach we identified 62 peptides containing single amino acid variants, which covered ~9% of all total coding nonsynonymous single nucleotide variants detected by whole-genome sequencing. Furthermore, we also identified 29 unique peptides that mapped to a hypothetical protein not present in the M. tuberculosis H37Rv reference proteome and provide evidence for the expression of this protein in the clinical M. tuberculosis SAWC3651 isolate. The strain-specific databases enabled confirmation of genomic differences (i.e. large genomic regions of difference and nonsynonymous single nucleotide variants) in these two clinical M. tuberculosis isolates and allowed strain differentiation at the proteome level. The approach applied in this study will help to expand the growing field of M. tuberculosis proteogenomics and has the potential to advance our understanding of strain variation in circulating M. tuberculosis strains. This could provide novel insights into biological mechanisms and pathogenesis of clinical M. tuberculosis isolates.

ABSTRACT NUMBER / ABSTRAKNOMMER: 29

DOING THE SAME SOMETHING SO THAT WE DID NOT DO NOTHING – A CRITICAL REVIEW OF EXPERIMENTAL EVALUATIONS OF SCHOOL-BASED HIV PREVENTION INTERVENTIONS IN SOUTHERN AFRICA.

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Young people – especially young women – are a priority group for HIV prevention. School-based sex education has been a staple component of national HIV programmes for young people in southern African since the early 1990s. Implementation of these interventions has been variable. Critiques include the individualist responsibilisation of health outcomes onto young people, failure to address structural drivers of HIV risk, and moralist censorship of African sexuality. We present critical review of the public health science of school-based HIV prevention interventions in southern Africa. We identified published evaluations of school-based HIV prevention interventions in southern Africa through (a) iterative searches on Pubmed, EbscoHost, and Google Scholar, and (b) 'pearl harvesting' from reference lists, including from 6 systematic reviews. Inclusion criteria were (1) experimental/quasi-experimental evaluations, (2) interventions aimed at changing behavior, (3) school-based intervention components, and (4) in southern, central or east Africa. We treated each paper as a narrative for critical discourse analysis in ATLAS.ti. We identified 22 discrete experiments that included data from 691 schools – primary and secondary – in 8 countries and with 50,667 young people. The interventions included a variety of delivery mechanisms and topics covered. Many interventions report significant effects on self-reported attitudes, frequency of communication, and HIV-related knowledge but none demonstrated impact on HIV risk – often impossible due to weak design or insufficient statistical power. In the rhetoric of the papers, this lack of impact is either ignored or explained away as anomalous to the context of the evaluation. Instead, a moral assertion that something must be done for young people in African schools is used to perpetuate further implementation despite the evidence. School-based HIV prevention interventions in southern Africa are not supported by HIV epidemiological evidence. Further research is necessary to interrogate the sociopolitical economy sustaining these interventions as axiomatic.

ABSTRACT NUMBER / ABSTRAKNOMMER: 30

OUTCOMES OF AIDS-ASSOCIATED KAPOSIS SARCOMA PATIENTS AT THE TYGERBERG ACADEMIC HOSPITAL INFECTIOUS DISEASES CLINIC.

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Objectives: In spite of the national anti-retroviral therapy (ART) roll out in 2004, AIDS-associated Kaposi's sarcoma (KS) continues to cause significant morbidity and mortality in South Africa. Reasons include, delayed HIV diagnosis, delayed initiation of ART and lack of access to oncology services for patients with advanced KS. In an attempt to improve access and optimise management of patients with AIDS- associated KS, the Tygerberg Academic Hospital Infectious Diseases clinic established a multidisciplinary KS clinic (MKSC) in 2014. Design and Method: A retrospective observational study was performed on all new cases referred to the MKSC from February until August 2014.Survival at one and two years from diagnosis was the primary outcome. Other data reported includes patient demographics, CD4 count, HIV viral load, co-infections and ART duration and regimens. Results: We reviewed 42 patients. Median age was 34yrs (range 20-60yrs) and 23 (54.8%) patients were female. At time of KS diagnosis two thirds of patients were on ART. Median CD4 count before diagnosis was 147 (range 4-811). HIV viral load was undetectable in 22 (52.4%) cases. Thirty eight (90.5%) patients were classified as poor risk. One third of patients were on tuberculosis treatment at time of presentation. Twenty two (52.4%) patients needed oncological therapy in addition to ART: 13 (59.1%) received chemotherapy alone, 3 (13.6%) received radiotherapy alone and 6 (27.2%) had both. Seven (31.8%) patients defaulted treatment. At a median follow-up of 22 months, 26 (62%) patients were alive at 12 months from biopsy and 21 (50%) were alive at 24 months from biopsy. Conclusion: Advanced AIDS-associated KS significantly affects young people in the Western Cape. Despite advanced disease at presentation and palliative treatment intent, half of patients survived to 2 years. A multidisciplinary KS clinic can contribute to improved outcomes of patients with severe disease.

ABSTRACT NUMBER / ABSTRAKNOMMER: 31

RE-WRITING THE HISTORY OF HIV-1 DIVERSITY IN SOUTH AFRICA.

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Background: During HIV infection latent cellular reservoirs are established in which HIV persists in a

The first cases of HIV-1 infection in South Africa were reported in 1982, with the virus first isolated in the country in 1984. In the early 1980s the epidemic was associated with HIV-1 subtypes B and D, mainly found amongst the homo- and bisexual risk group patients. Since the late 1980s there has been an explosive expansion of the HIV-1 epidemic, associated with subtype C and the heterosexual population. Through various retrospective studies, literature searches and in depth sequence analyses we can now detail the history of HIV-1 in infection much clearer. We have shown that the HIV-1 subtype C epidemic in South Africa most likely started as early as the mid-1960s. We have also reported cases of HIV-1 subtype B transmission amongst heterosexual patients from the early epidemic. In addition, HIV-1 near full-length sequence analyses shows that recombinants between the various subtypes were already present from the start of the epidemic in South Africa. Although HIV-1 subtype C still predominates, we are identifying a growing number of unique recombinant forms from present day virus sequences analysed. It is important to keep tract of the viral strains

circulating, as the epidemic continuously evolves. HIV-1 diversity can especially influence diagnostic assays, antiretroviral therapy outcomes as well as vaccine development.

ABSTRACT NUMBER / ABSTRAKNOMMER: 32

HIV-ASSOCIATED PURE MOTOR CERVICAL AND LUMBOSACRAL POLYRADICULOPATHY

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HIV-associated pure motor cervical and lumbosacral polyradiculopathy M Khider, F Henning Division of Neurology, Faculty of Health Sciences, University of Stellenbosch BACKGROUND: Polyradiculopathy is an uncommon but well described complication of human immunodeficiency virus infection. Previous case reports suggest that the condition involves only the lumbosacral region, and simultaneous involvement of the motor roots of both the cervical and lumbosacral regions has not been described before. CASE PRESENTATION: We present two cases with a three to five months history of asymmetrical progressive weakness of the upper and lower limbs. Both were newly diagnosed with HIV infection at the time of presentation. No sensory symptoms were present. Neurological examination revealed globally absent reflexes and generalized weakness. MRI showed cervical and lumbosacral root enhancement and CSF analysis showed high protein and a lymphocytic pleocytosis. Electrophysiological study showed a predominantly motor axonal neuropathy. The first patient was treated with intravenous methylprednisolone followed by oral prednisolone and made a good recovery. The second patient was initially treated with intravenous methylprednisolone, followed by oral prednisolone. Unfortunately, no improvement in his clinical condition was evident. He was subsequently treated with intravenous immunoglobulin, after which he made a good recovery. Follow up MRI for both patients revealed resolution of root enhancement. DISCUSSION: We describe two newly diagnosed HIV-positive patients who presented with pure motor cervical and lumbosacral polyradiculopathies, responsive to immunotherapy. As we have been unable to define alternative etiologies, we suggest that the syndrome is related to immune dysregulation in HIV infection.

ABSTRACT NUMBER / ABSTRAKNOMMER: 33

INVESTIGATION OF THE ROLE OF MYELOID-DERIVED SUPPRESSOR CELLS IN PERIPHERAL BLOOD DURING THE IMMUNE RESPONSE TO TB DISEASE, AND THE IDENTIFICATION OF THE MECHANISM BY WHICH THE CAVEOLIN PROTEIN MAY AFFECT THIS ROLE.

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Myeloid-derived suppressor cells (MDSCs), innate immune cells highly researched in cancer biology, have recently gained attention in the TB field when their involvement in bacterial and viral infections became apparent. The various M.tb infection profiles in the host have been comprehensively outlined, although understanding of the mechanisms behind progression are poorly understood. It is known that inadequate T cell responses contribute to TB disease progression, as is seen during HIV infection, but in cases where individuals with TB are otherwise healthy, the cause is unknown. The suppressive capacity of MDSCs have been investigated in TB disease, however, M.tb-specific immunosuppression was not assessed. While MDSCs are down-regulated during HIV and TB treatment, this may be indicative of the restoration of protective immunity. An interesting membrane protein, caveolin, is expressed on murine and human MDSC cell surfaces, and the caveolin signaling pathway is upregulated during TB treatment. Through the expression of caveolin-1 at the plasma membrane of various phagocytes, cholesterol rich invaginations of the plasma membrane are formed that are capable of endocytosing various molecules, including live bacteria, and forming pH neutral, endosome-like structures. Here, endocytosed bacteria are likely capable

of evading host immunity, as well as be nourished by the abundance of lipids. A murine M.tb infection model has shown the presence of live M.tb within MDSCs, but no proof of this exists in human TB studies. It is understood that MDSCs are poorly phagocytic, so considering the evidence that live M.tb bacilli may be internalized by them, suggests that they are utilizing an alternative entry mechanism, such as the pathway involving caveolin. We hypothesize that MDSC-mediated suppression is important during active TB, and plan to investigate whether their suppressive capacity is M.tb-specific or not, as well as investigate the presence or absence of caveolin on their surface.

ABSTRACT NUMBER / ABSTRAKNOMMER: 34

IDENTIFICATION OF NUCLEIC ACID-ASSOCIATED PROTEINS OF THE MYCOBACTERIUM SMEGMATIS STATIONARY GROWTH PHASE.

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Elucidation of Mycobacterium tuberculosis responses to stresses accompanying host infection remains crucial for our efforts to understand tuberculosis infection and persistence. Adaption to the host environment is a complex multifactor-mediated response and new methodologies are required to identify effector proteins. In this study, we aimed to identify nucleic acid-associated proteins unique to the stationary growth phase. We hypothesize that the identification of nucleoproteins unique to stressful growth conditions may provide novel insights into M. tuberculosis adaption. We used the closely related, non-pathogenic and fast growing organism Mycobacterium smegmatis for the purpose of method development. Nucleoprotein complexes from crosslinked exponential and stationary phase cultures were captured onto a solid matrix using an anti-RNA polymerase antibody. On-bead tryptic digestion was performed prior to high-resolution tandem mass spectrometry. Nucleic acid-associated proteins were identified via automated database search of the acquired tandem mass spectra using the Andromeda search algorithm, which forms part of MaxQuant 1.5.3.17. Two hundred and forty proteins were identified of which 28 were unique to the exponential growth phase and 66 to the stationary growth phase. Stress proteins were only detected within the stationary growth phase and included the hypoxic response regulator DevR, also known as the dormancy survival regulator. Other stress proteins identified included HspX, an anoxia induced stress protein, and the ribosome hibernation promoting factor Hpf. These data demonstrated that our novel approach selectively enriched for nucleic acid-associated proteins associated with the stationary phase and successfully identified multiple effector proteins which mediate a dormancy cell response. We therefore propose that this approach can be used to investigate stressful external stimuli experienced by M. tuberculosis to further our understanding of how this pathogenic organism adapts to the host environment.

ABSTRACT NUMBER / ABSTRAKNOMMER: 35

EFFECT OF PHARMACOLOGICALLY-INDUCED MYELOID DERIVED SUPPRESSOR CELL MATURATION ON IMMUNE REACTIVITY AGAINST MYCOBACTERIUM TUBERCULOSIS.

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Identification of therapy regimens that confer faster cure of TB will contribute to disease containment and improve global health. Several studies have shown that development of active TB disease is attributed to the failure of an effective host Tcell helper1 cytokine response during Mycobacterium tuberculosis infection. Several immune mechanisms exist that suppress effector responses in the presence of persistent antigens to limit immune mediated tissue pathology. Myeloid derived suppressor cells (MDSC) are a heterologous population of undifferentiated immature innate cells that increase in frequency under conditions of excessive inflammation. Recently it was shown that MDSCs also have the ability to suppress Tcell responses in an antigen specific and nonspecific manner in various infectious diseases. Small molecules, such as the naturally occurring vitamin A metabolite all-trans retinoic acid (ATRA), induce maturation of MDSCs and restricts primary progressive TB pneumonia in a murine model. Our hypothesis is that ATRA induced MDSC maturation, decreases the immunosuppression acting on the immune response during M.tb infection. The main goal of the project is to measure the effect of ATRA on anti TB immune responses, such as innate and adaptive immune cell function and phenotype. Isolation of MDSC from peripheral blood, followed by in vitro culture in the presence or absence of ATRA at physiological concentration to evaluate the relationship between ATRA concentration and its effect on MDSC phenotype. To ascertain the effect of ATRA supplementation on PB MDSC mediated suppression of T cells and establish whether suppression is mediated by cell to cell contact or soluble factors. Isolations of MDSC from all participants recruited are complete. In vitro cultures are currently ongoing, with Flow cytometry and Luminex to follow once cultures are complete.

ABSTRACT NUMBER / ABSTRAKNOMMER: 36

COMPARATIVE ANALYSIS OF NON-/IMMUNOSUPPRESSIVE EXOSOMES OF INNATE CELLS FROM BRONCHOALVEOLAR LAVAGE FLUID (BALF) AND BLOOD OF PATIENTS WITH TB AND OTHER RESPIRATORY DISEASES.

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Background: Exosomes are small vesicles released from different cell types in the body including those in the respiratory tract and lungs. These cell-derived vesicles are present in most body fluids of healthy individuals but their levels are reportedly higher in diseased states with the highest concentration measured in the blood and BALF. Exosomes contain biomolecules (proteins, RNA and lipids) which vary between each cell type and disease condition, consequently, the variation in the biological composition of these vesicles has been identified as a promising diagnostic and prognostic tool for non-/infectious respiratory disease including Tuberculosis (TB). Studies conducted in vivo have indicated that exosomes isolated from BALF express specific proteins in TB, but no clinical comparison has been conducted to other respiratory disease and between different innate immune cell types. Aim: Isolate exosomes from the BALF and immunosuppressive innate cell population, (myeloid derived suppressor cells (MDSC) and corresponding non-suppressive innate cells, (monocytes/alveolar macrophages), from the lungs and blood of patients with TB and other respiratory disease. Conduct a comparative analysis on the protein expression and biological activity of the isolated exosomes. Method: Collected BALF and blood from patients presenting with TB (those showing symptoms and with active TB; n=20), other respiratory disease (n=20) and house hold contacts (n=5). Total exosomes were isolated from supernatant of BALF whilst cell-specific exosomes were isolated from the PPD-stimulated MDSCs, monocytes and alveolar macrophages. Proteomic analysis of exosomes was conducted with LC-MS and metabolic and pro-inflammatory activity was measured with the ELISA and flow cytometry. Results and conclusion. The difference in composition and biological activity between the exosomes from different cell types and disease states indicates

that underlying mechanisms involved in the intercellular signaling of these vesicles is complex and further biological characterization of clinical samples is needed in their development as biomarkers for TB diagnosis.

ABSTRACT NUMBER / ABSTRAKNOMMER: 37

OUTCOMES OF HIV-ASSOCIATED THROMBOTIC THROMBOCYTOPAENIC PURPURA: A 5-YEAR RETROSPECTIVE COHORT STUDY DURING THE ANTI-RETROVIRAL THERAPY ERA.

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Background: HIV-associated thrombotic thrombocytopaenic purpura (TTP) remains a common condition in South Africa (SA) despite the availability of anti-retroviral therapy (ART). Objectives: Our primary objective was to compare the time to remission in those with and without HIV. Secondary objectives included response rates to plasma infusion as compared with plasma exchange, identifying predictors of remission, relapse and mortality rates. Methods: This was a single center, retrospective cohort study conducted at Tygerberg Hospital in Cape Town, SA from 1 January 2010 to 31 January 2015. The records of adult patients requiring ≥ 5 units of fresh frozen plasma for ≥ 1 day during admission were screened for a diagnosis of TTP. Cases were defined by the presence of red blood cell fragments on blood smear, raised serum lactate dehydrogenase and thrombocytopaenia. Results: Time to remission was 10 days in the HIV-positive group as compared to 19 days in the HIV-negative group, P = 0.18. Most of the patients were black females (78.8%). Fever was a common finding at presentation in those with HIV (56.1% versus 18.2%, P = 0.03). Neurological complications were common in both groups (78.8%). Most of the patients in the HIV group were managed exclusively with plasma infusion (90.2% versus 45.5%, P < 0.01). There were no differences in the time to remission regardless of whether patients received plasma infusion only or plasma exchange. Overall mortality was 44.2%, with no differences between the groups. Conclusion: Patients with HIV had a shorter time to remission and were more likely to achieve remission with plasma infusion only than their HIV-negative counterparts. ART initiation during hospitalization was also associated with greater odds of achieving remission. Mortality rates were high despite the availability of ART.

ABSTRACT NUMBER / ABSTRAKNOMMER: 38

VARIATION IN THE NOTIFIED BURDEN OF PREVIOUSLY TREATED TUBERCULOSIS IN THE 52 HEALTH DISTRICTS IN SOUTH AFRICA.

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BACKGROUND: Management of tuberculosis (TB) in patients with a history of previous TB treatment poses a serious challenge to TB control due to the risk of more extensive and of drug-resistant disease, and more unfavourable treatment outcomes. We aimed to investigate the proportion of individuals previously treated for TB among routinely registered TB patients in South Africa, and whether it varied across the 52 health districts. METHODS: We used data extracted from the national electronic TB register (ETR.net). An ecological analysis was conducted on all bacteriologically confirmed TB cases treated for presumed drug-sensitive (DS) TB in 2011, using the district as unit of

observation. The proportion of previously treated TB patients was estimated using patient category information (new vs. re-treatment). RESULTS: A total of 182,455 bacteriologically confirmed TB patients started DS-TB treatment in South Africa in 2011. At the district level, the median proportion of patients with a history of previous TB treatment was 17.2% (interquartile range: 11.6%-22.1%, total range: 7.6%-39.6%). We found a strong linear correlation between the percentage previously treated patients and each of the following indicators: the rate of new TB notifications per 100,000 population (Spearman correlation coefficient [r]=0.63; P<0.001) and the percentage HIV-positive new TB patients [of those with known HIV status] (inverse correlation, r=-0.70; P<0.001). CONCLUSIONS: There is substantial variation in the proportion of TB patients with a history of previous TB treatment across South African health districts. The reasons for this variation and its implications for TB control programs, including the associated drug-resistant TB burden, are currently not known. We speculate that TB recurrence due to reinfection (in districts with high background TB rates) and higher probability of survival following a first TB episode in the absence of HIV infection may partly explain the high proportions of previously treated patients observed in several districts.

ABSTRACT NUMBER / ABSTRAKNOMMER: 39

A NOVEL IFNγ RELEASE ASSAY FOR THE DETECTION OF MYCOBACTERIUM BOVIS INFECTION IN AFRICAN BUFFALOES (*SYNCERUS CAFFER*)

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African buffaloes (Syncerus caffer) are maintenance hosts of Mycobacterium bovis, the cause of bovine tuberculosis (bTB), and pose an infection risk for cattle and other wildlife species. In South Africa, the Tuberculin Skin Test (TST) is the accepted diagnostic test for buffaloes, however it poses logistical challenges for testing wild animals and its interpretation differs between operators. The manufacturers of the QFT system (Qiagen) have developed the Cattletype® IGRA using QFT tubes and a bovine-specific IFNγ ELISA. The aim of this pilot study was to determine: 1) the test performance of this novel IGRA compared to current tests in detecting bTB in buffaloes, 2) the effect of a lengthened incubation time on assay sensitivity, 3) assay reproducibility and 4) assay specificity. In 2016, buffaloes were tested using the TST, Bovigam®, and Qiagen IGRA, and test agreement calculated. TST and/or Bovigam® test-positive buffaloes were culled and M. bovis infection was confirmed using culture and genetic speciation. The assays incubation time was lengthened to 40-hours and compared to the standard 20-hour incubation time. The intra- and inter-assay variability was calculated. Additionally, 21-M. bovis free buffaloes were tested for assay specificity. The test agreements between the TST, Bovigam®, and Qiagen IGRA were good. Increased sensitivity was achieved by a lengthened incubation time and implementing a buffalo-specific cutoff. The IGRA demonstrated high reproducibility and 100% sensitivity. The test performance of this novel IGRA is as good as currently available diagnostic tests. Furthermore, a lengthened antigen incubation time increased assay sensitivity. Improved sensitivity was also achieved by calculating a buffalo-specific cutoff. The novel IGRA was shown to be highly reproducible and highly specific. The data from this pilot study suggests that this novel IGRA is a promising assay to diagnose bTB in buffaloes. Further research is needed to confirm our findings in larger populations.

ABSTRACT NUMBER / ABSTRAKNOMMER: 40

ISONIAZID RESISTANCE AND DOSAGE AS TREATMENT FOR PATIENTS WITH TUBERCULOSIS.

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The first-line TB antibiotic isoniazid (INH) serves as a central component of combined first-line anti-tuberculosis drug therapy. However, resistance to INH has hindered the functioning of this drug. Resistance is caused by several known and unknown mutations in genes/regions in Mycobacterium tuberculosis, followed by selection of these mutants in the presence of the drug. INH resistance can be categorised as either "high-level" (minimum inhibitory concentration (MIC) of > 1µg/mL to INH) or "low-level" (MIC between 0.1-1.0 µg/L) resistance and is dependent on the specific mutation acquired. Low-level resistance to INH is common and may affect up to 50% of TB patients. The level of resistance is relevant, as INH resistance is often considered to be the first step in development of multi-drug resistant (MDR) and extremely resistant (XDR) TB. Isoniazid is a pro-drug in which first pass metabolism happens via N-acetyltransferase and is either fast, intermediate or slow, depending on the genetics of the host. Thus, low-level INH resistance, particularly in the presence of fast metabolism, could allow additional mutations, development of high-level resistance and progression to multi-drug resistance. In this review, we will examine this problem in detail with evidence for these processes and make recommendations regarding interpreting genotype and phenotype diagnosis of low-level INH resistance, its effects in combination with INH metabolism and make suggestions concerning INH dosage. This knowledge may be used in future to reduce the incidence of isoniazid mono-resistant and multi-drug resistant (MDR) tuberculosis, and to improve current treatment regimens. Keywords: dosage, tuberculosis, isoniazid, resistance, metabolism and acetylation.

ABSTRACT NUMBER / ABSTRAKNOMMER: 41

RESPIRATORY AND GUT MICROBIAL COMMUNITIES ARE ALTERED IN PATIENTS WITH ACTIVE TUBERCULOSIS.

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Tuberculosis (TB) is the single largest infectious cause of death worldwide, and involves antibiotic treatment for at least 6 months, however, the association of TB with the microbiome is poorly studied. To test this association, we collected saliva, sputum and stool specimens from two ongoing randomised controlled trials, namely: BAR-TB and "Newer and emerging treatment for multidrug-resistant TB" (NExT). In BAR-TB, we recruited 23 pre-treatment patients with symptoms suggestive of TB, where cases and controls were classified based on a positive (n=10) or negative (n=13) Mycobacterium tuberculosis culture. Patients in NExT had MDR-TB and were randomised into a 24-month routine arm (n=4) or a 6-month, injection-free intervention arm (n=5). For NExT, two healthy household contacts (confirmed culture-negative) per patient had the same specimens collected. Sequencing of the V4 16S rRNA gene region was done using the Illumina MiSeq. Operational taxonomic units were assigned to sequence reads using QIIME and Greengenes, and statistical analyses done using R. To adjust for potential contamination, background controls were sequenced and clustered differently to clinical samples during analysis. In BAR-TB, distinct microbial communities

were associated with active TB and alcohol use, most notably in stool. In NExT, patients in the intervention arm, but not the routine arm, had reduced diversity and altered microbial composition by 6-weeks of MDR treatment, compared to pre-treatment. These effects are likely mediated by linezolid, a broad-spectrum antibiotic in the intervention arm. While preliminary, these findings indicate that altered microbial communities in sputum (and for the first time, in stool) are associated with active TB before treatment. Furthermore, different regimens likely differentially perturb the microbiome, however, the long-term significance (e.g. role in relapse, post-TB complications) requires further investigation. Future analyses will investigate the association of the microbiome with bacterial metabolite production, immune markers and clinical outcome in TB.

ABSTRACT NUMBER / ABSTRAKNOMMER: 42

UPREGULATION OF CHRONIC INFLAMMATORY CYTOKINES DESPITE EARLY TREATMENT AND VIROLOGICAL SUPPRESSION IN CHILDREN: A ROLE IN HIV PERSISTENCE?

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There is limited knowledge of the immunological mechanisms contributing to HIV persistence in infected children. Observations in adult cohorts have implicated proinflammatory cytokines in viral reservoir establishment and persistence through low-level viral replication despite long-term therapy. This study aimed to longitudinally compare inflammatory cytokine levels in virologically suppressed children soon after therapy and at 7-8 years. Baseline (within 6 months of age) and follow-up (7-8 years) plasma samples originating from the CHER trial were evaluated. Children started ART at < 1 year of age and sustained viral suppression at follow-up. Twenty-six cytokines were measured using validated Multiplex assays. A subset of participants was also tested for total HIV-1 DNA using qPCR targeting a conserved region in HIV integrase. The median baseline viral load at ART initiation was 738,500.5 copies/ml (range: 399–750001 copies/ml). Six participants had detectable viral loads from < 40 to 19,549 copies/ml at follow-up. The median CD4 counts at baseline and follow-up were 1,853.5 (range: 823–3450) and 933.5 (range: 20–2063) respectively. In Arm 1, significantly higher levels of INF-γ ($P = 0.0117$), IL-17A, TNF-α, RANTES (all $P = 0.0039$) and G-CSF ($P = 0.0078$) were observed at baseline. A significant increase in cytokine expression was observed for IL-13, IL-4 ($P = 0.0156$), VEGF, MCP-1, and PDGF-BB (all $P = 0.0039$) at follow-up. Cytokine expression in Arm 2 showed highly significant elevations at follow-up for IL-13 ($P = 0.0005$), VEGF ($P < 0.0001$), FGF-basic ($P < 0.0001$), MCP-1 ($P < 0.001$), and PDGF-BB ($P < 0.0001$). In 23 children assessed for HIV-1 DNA at follow-up, a median of 32.5 copies/million cells (range: 0–247.6) was observed. Children initiated on ART early showed an increase in chronic inflammatory disease-cytokine expression following 7-8 years on suppressive therapy and despite the low level of cell-associated DNA.

ABSTRACT NUMBER / ABSTRAKNOMMER: 43

THE EPIDEMIOLOGY OF GRAM NEGATIVE BACTERAEMIA AT TYGERBERG HOSPITAL.

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Background: E. coli and K. pneumoniae are common causes of bacteraemia. β-lactam antibiotics are used to treat these infections. Common cephalosporin and carbapenem resistance mechanisms include extended spectrum β-lactamases (ESBLs) and carbapenemases respectively. ESBLs belong to three major families: TEM, SHV and CTX-M. There is limited local data describing ESBL distribution. This is important for surveillance and evaluating infection prevention practices. Methods: Bacteraemic E. coli (n=70) and K. pneumoniae (n=70) isolates were collected from the NHLS Microbiology

laboratory between April 2015 and March 2016. Identification and antibiotic susceptibility testing (AST) were performed as part of routine testing. Carbapenemase and ESBL genes were detected by PCR, and CTX-M genes characterised by PCR. Isolates were typed using rep-PCR, and images analysed using Gel compar. Results: 31% (44/140) of patients were paediatric. Patients were located in wards throughout the hospital. 54% (38/70) of K. pneumoniae and 16% (11/70) of E. coli were cephalosporin resistant (presumed ESBL). None were carbapenem resistant. There was good correlation between phenotypic AST and ESBL PCR. No isolates contained carbapenemase genes. TEM and SHV were the commonest β-lactamases in E. coli (49/70; 70%) and K. pneumoniae (59/70; 84,3%) respectively. Multiple genes were present in 42/70 (60%) of K. pneumoniae isolates, and only 4/70 (5,7%) of E. coli isolates. Of the 46 CTX-M genes, 43 were group 1, two were group 9, and one was untypeable. Strain typing showed substantial diversity among E. coli and K. pneumoniae, with minimal clustering. There was no association between clusters and hospital wards or ESBL type. Conclusions: While the commonest β-lactamases were TEM- and SHV-related, additional work is needed to further classify these genes. The lack of clustering suggests multiple clones in the hospital. Differentiation of hospital and community acquired infection, and additional molecular typing is planned to further investigate this.

ABSTRACT NUMBER / ABSTRAKNOMMER: 44

SECONDARY UTILITY OF ARCHIVED PATHOLOGY FFPE TISSUE BLOCKS: DNA QUALITY ASSESSMENT FOR THE PURPOSE OF DOWNSTREAM MOLECULAR ANALYSIS.

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Formalin fixed paraffin embedded (FFPE) tissue, the gold standard for histopathological diagnosis of disease, can be a valuable resource for disease specific molecular research. However it is challenging to obtain high quality DNA from FFPE tissue. The aim of this study was to evaluate whether the quantity and quality of DNA extracted from remnant FFPE tissue is suitable for use in PCR and genotyping. Selection criteria included diagnosis of cervical intraepithelial neoplasia or invasive squamous cell carcinoma and HPV positive cytology. FFPE tissue blocks retained for 1, 5, 10 and 20 years (n=5 per year) were used. Two DNA extraction methods were compared: a xylene-based deparaffinization method (QIAamp DNA FFPE tissue kit) and a xylene-free method (BiOstic® FFPE tissue DNA isolation kit). DNA quantity and purity was assessed using spectrophotometry and fluorometry. DNA quality was determined through amplification of the human ß-globin gene. The suitability of DNA for PCR was assessed through amplification of HPV16 and HPV 18 E7 genes and genotyping (Linear array® HPV genotyping test). DNA yields for both DNA extraction methods were similar. The BiOstic® kit yielded DNA of greater purity compared to the QIAamp kit as the A260nm/A280nm ratios were between 1.7 and 1.9. The QIAamp kit was found to limit chemical reagent carryover since A260nm/A230nm ratios were below 2.0. Three human ß-globin fragments (110 bp, 268 bp and 536 bp) were successfully amplified. No PCR products were obtained for the larger ß-globin fragments. Amplicons were obtained for HPV 16 E7 gene, however none were detected for the HPV 18 E7, suggesting that HPV 16 might be the predominant strain in samples tested. Although DNA fragmentation may impede amplification of larger DNA fragments, DNA extracted from archived FFPE samples may be used for determination of HPV subtyping by sensitive molecular applications such as PCR and genotyping.

ABSTRACT NUMBER / ABSTRAKNOMMER: 45

UNDERSTANDING THE PHYSIOLOGICAL STATE OF DRUG RESISTANT MYCOBACTERIUM TUBERCULOSIS STRAINS.

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Background: The rising incidence of drug resistant Mycobacterium tuberculosis strains negatively influences Tuberculosis control. Limited data exist on the physiological changes of Mtb during treatment. For this reason, we aim to assess the physiological changes of Mtb at the transcriptional level during antibiotic treatment. The study aims to decipher how the physiological state of drug resistant Mtb exposed to sub-lethal concentrations of isoniazid (INH) contributes to prolonged TB treatment. Methods: Pan-susceptible Beijing clinical isolate (K636), K636 rifampicin resistant in vitro mutant and laboratory strain H37Rv were cultured in 7H9 enriched media and on 7H11 agar plates, for daily OD600 readings and CFU/ml assessment. Followed by assessing the optimal concentration of INH was by titration kill-curve. Additionally, total RNA was extracted and purified (after 24 hrs INH exposure), for gene expression analysis by Quantitative Real-time polymerase chain reaction (RT-qPCR) for selected genes kasA, accD6, acpM and ahpC. Results: The sub-lethal concentrations of INH were observed to be 0.05 µg/ml for K636 and H37Rv. RT-qPCR was used to validate that the selected drug concentrations are influencing mycobacterial growth as expected. The high level gene expression changes were observed in kasA, accD6, acpM and ahpC for the strains when normalised to 16S rRNA and SigA (housekeeping genes) respectively, after 24 hrs treatment with sub-lethal concentrations of INH. Conclusion: The variation in sub-lethal concentrations of INH observed suggests that the strains might employ different adaptive mechanisms to survive INH drug exposure. The high level gene response changes in transcriptional level of kasA, accD6, acpM and ahpC validate that our sub-lethal INH treatment did induce gene-expression changes in tested Mtb strains. These findings were further confirmed by performing RNA-sequencing to characterize the physiology of the studied Mtb strains as it is anticipated that the associated physiological changes will be reflected in their total transcriptome.

ABSTRACT NUMBER / ABSTRAKNOMMER: 46

MOUSE MACROPHAGES DISPLAY DIFFERENTIAL EXPRESSION OF DECTIN GENES WHEN COMPARING INFECTION BETWEEN PATHOGENIC AND NON-PATHOGENIC MYCOBACTERIA.

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The disease causing agent, Mycobacterium tuberculosis, survives inside human macrophages. However, non-pathogenic mycobacteria do not survive inside healthy host cells. Studying the host response towards infection with mycobacteria of different pathogenicities might reveal important determinants (molecules) that are involved in Mycobacterium's intracellular survival strategy. Our previous study (RNA-Seq) observed that mouse macrophages express RNA molecules at different levels, when comparing infection between pathogenic (Mycobacterium tuberculosis H37Rv and clinical isolate R179) and non-pathogenic mycobacteria (Mycobacterium smegmatis and bovis BCG). To validate the differential expression of RNA molecules, mouse macrophages were infected with the same strains followed by extraction of macrophage RNA to determine the relative expression levels through qPCR. Expression levels compare very closely between the data from the RNA-Seq and qPCR experiments. In particular, CLEC4a1 and CLEC4n, coding for Dectins which are involved in binding and uptake of pathogens, are seen to be unchanged in its relative expression levels upon infection with M. smegmatis, yet upregulated upon infection with the other three strains. Of significance is that M. smegmatis normally gets killed inside these macrophages while the other three strains survive.

ABSTRACT NUMBER / ABSTRAKNOMMER: 47

INVESTIGATING THE ASSOCIATION BETWEEN MENDELIAN SUSCEPTIBILITY TO MYCOBACTERIAL DISEASE CAUSING GENES AND TB SUSCEPTIBILITY.

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The host response to mycobacterial infections is a cell-mediated immunity, mediated by the type I cytokines. Mycobacteria are intercellular pathogens and the host defense necessitates an effective cell-mediated response. Death during this response leads to susceptibility to poorly pathogenic mycobacterial species. Many mutations in genes encoding major components of type I cytokines have been described which predispose individuals to Mendelian susceptibility to mycobacterial disease (MSMD). MSMD is a rare condition characterized by predisposition to clinical diseases caused by weakly virulent mycobacteria. MSMD-causing mutations have been identified in ten genes that encode components of the interleukin 12 and 23 interferon gamma pathway. The disease causing mutations in genes involved in this pathway display a high level of allelic heterogeneity, which accounts for a number of distinct genetic disorders that vary in their mode of inheritance and clinical presentation. Using the Illumina Multi-ethic genotypic array, genotyping was done on the South African Coloured population. Our case-control association tests, gene-gene interaction analysis of the candidate genes and a functional protein interaction network between the genes, enabled us to identify 8 SNPs that were significantly associated associated with increased TB susceptibility, namely rs6928015, rs17066192, rs75800688, rs9926067, rs16939994, rs16990664, rs11151950,1 rs4986958. Our results revealed an epistatic interaction between rs16990664 (in IFNGR2) and rs16939994 (IRF8) which increases susceptibility to TB (p-value 0.0258 and q-value 0.5725). The in silico protein network analysis showed no direct interaction between the IFNGR2 and IRF8 genes. Additionally, the protein interaction results showed that these genes are interconnected within the same pathway. This result is expected because these genes are all present in the IL12 and IL23 pathway.

ABSTRACT NUMBER / ABSTRAKNOMMER: 48

A GENE-BASED GENOME-WIDE ASSOCIATION STUDY OF TUBERCULOSIS SUSCEPTIBILITY IN A SOUTH AFRICAN POPULATION.

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The Human Genome Project and later, next generation sequencing (NGS), has caused a paradigm shift in genetic disease research by driving the expansion of catalogs of human genetic variation. This has increased the utility of genome-wide association studies (GWAS) in several populations. Unfortunately, multi-way admixed populations, including the South African Coloured (SAC) population, are not included in these genomic databases, limiting genetic research of this group. GWAS require stringent multiple testing correction, further decreasing power. As the need for a true representative genomic reference for this unique population has not yet been met, other methods are required to increase the power of GWAS in order to detect associations. Here we applied gene-based association tests to past tuberculosis (TB) GWAS performed using the SAC population to elevate the

power of the study. By decreasing the number of multiple tests, significant genes were identified and subjected to multiple pathway analysis tools to identify functionally relevant genes that play a role in TB susceptibility. Through this methodology, we identified four candidates. Carcinoembryonic antigen-related cell adhesion molecule 3 is involved in the inflammatory response specifically by regulating expression of tumor necrosis factor and interferon-gamma. Adenosine triphosphatase H+ Transporting V1 Subunit B2 is responsible for acidifying cellular compartments, ensuring phagosome maturation to the phagolysosome. Ubiquitin specific protease 24 plays a role in the ubiquitin-mediated autophagy pathway – a key process in innate immunity against Mycobacterium tuberculosis. Finally, U2 Small Nuclear RNA Auxiliary Factor 1 is a member of the spliceosomal complex, a cellular component that regulates post-transcriptional modifications such as alternative splicing, which tightly controls the expression of cytokines and transcription factors regulating the immune system. These genes are therefore possible candidate genes for further analysis and potentially, future host-directed therapy targets.

ABSTRACT NUMBER / ABSTRAKNOMMER: 49

NOVEL QPCR ASSAYS FOR THE MEASUREMENT OF IMMUNE GENE EXPRESSION IN WHOLE BLOOD OF AFRICAN LIONS (*PANTHERA LEO*)

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Background: Infectious pathogens such as Mycobacterium bovis and feline immunodeficiency virus (FIV) impact the ecology of African lions (Panthera leo) which in turn influence the function and biodiversity of the ecosystem. Biomarkers which act as indicators of disease states are required to understand how these pathogens affect lion populations. In humans, measurement of gene expression is a valuable indicator of immune status and has previously been used to detect M. bovis infection in lions. Methods: Lions from the M. bovis endemic Kruger National Park population were sampled opportunistically and whole blood stimulated using the QuantiFERON®-TB Gold (In Tube), which employs peptides simulating the antigens early secreted antigenic target 6 kDa protein, culture filtrate protein 10 and TB7.7. This system was developed for use in human TB screening, but has recently been used in wildlife. Novel primer sets were designed to measure the expression of CXCL8, IL10, GATA3, TBX21, CD4, FCGR1A, CCL2, CXCL11 and TNFA mRNA by qPCR. The relative gene expression as well as the antigen specific gene expression was determined. The coefficient of variation was calculated for all parameters. Results: All qPCR assays were able to amplify the appropriate target mRNA from whole blood samples of four selected African lions with varying states of M. bovis and FIV infection with similar efficiencies. In the unstimulated sample from these animals, the genes CXCL11, IL8, TBX21, CD4 and FCGR1A showed greatest variation in their relative expression values. Gene expression ratios showed greatest variation for IL8 and the greatest antigen-induced changes were observed in CXCL11, which shows promise as a marker of M. bovis infection. Conclusions: The assays developed in this study provide tools for the measurement of immune gene expression in African lions and could be used to investigate disease states in this species.

ABSTRACT NUMBER / ABSTRAKNOMMER: 50

EVALUATION OF HOST MARKERS FOR TRACKING EARLY TREATMENT RESPONSE IN NEWLY DIAGNOSED PULMONARY TB PATIENTS.

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Introduction: The development of simple and rapid immunological biomarkers that indicate early drug efficacy would reduce the cost of clinical trials and furthermore accelerate new drug development for the treatment of TB. We investigated the profiles of inflammatory markers of active TB patients undergoing treatment and attempted to identify biomarkers that correlate with early treatment response as assessed by early bactericidal activity (EBA). Method: One hundred newly diagnosed pulmonary TB patients who were taking part in a 14 day phase II EBA clinical trial were randomized into 7 treatments arms. The first six treatment arms received different doses of single or drug combinations while the seventh treatment arm received Rifafour e-275 as the positive control. Sputum and serum samples were collected simultaneously at the start (D0) and end of EBA (D14). The sputum bacterial load was determined by time to culture positivity and colony forming units while a total of 33 host markers were measured in the serum using the Luminex platform. Result: Although there was a significant change in the expression of CRP, IL-6, VEGF, sIL2Rα, Ferritin, and sTNFRII from D0 to D14 in several of the treatment groups, no single marker changes consistently correlated with the decline in bacterial measures in sputum. A four-marker model including IL-2, MMP-9, sCD137 and Granzyme A only accounted for 20% of the variation observed in TTP and the combination of A2M, sIL-2Ra, sIL-6R and sTNFRII predicted only 20% of the variation in CFU. CRP showed the most changes over the study period. Conclusion: The findings from our study suggest that the selected host markers are not a suitable replacement for CFU in the assessment of EBA. Activation markers such as CRP if measured early may be a valuable adjunct in monitoring TB therapy.

ABSTRACT NUMBER / ABSTRAKNOMMER: 51

SIGNALS OF POSITIVE SELECTION IN IMMUNE RESPONSE GENES OF AN ADMIXED SOUTHERN AFRICAN POPULATION.

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The recent availability of exome sequence data and improved statistical analyses has facilitated investigations into the extent of selective pressure due to pathogens in numerous populations. However, there have been very few studies investigating this in southern African populations where it is hypothesized that the selective pressure due to tuberculosis and smallpox was vast. Here, we perform a positive selection scan using the population branch statistic to identify signals of selection associated with viral or bacterial immune response in the highly admixed South African Coloured (SAC) population. Using ancestral populations from the 1000 Genomes Project for comparison, we found SAC-specific signals of selection in genes associated with focal adhesion and extra-cellular matrix receptor interactions. These signals were located in IL17RA, TIMM44, ACSM5, EDARDD, several SLC genes and FRAS1 amongst other genes. In addition, we identified a selection hotspot on chromosome 11q23.3 which is associated with abnormal immune system physiology. This study not only confirms the role that natural selection plays in shaping human immunity, it also highlights particular novel pathways associated with both viral and bacterial immune response that could be investigated further, particularly with respect to TB susceptibility in southern Africa.

ABSTRACT NUMBER / ABSTRAKNOMMER: 52

RV1460 FUNCTIONS AS A REPRESSOR OF THE RV1460-RV1461-RV1462-RV1463-CSD-RV1465-RV1466 OPERON IN MYCOBACTERIUM TUBERCULOSIS.

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Iron-sulphur (Fe-S) clusters are protein cofactors required by proteins with diverse functions. In vivo, Fe-S cluster biogenesis systems are essential for the synthesis of Fe-S clusters, due to their sensitivity to oxidation. In Mycobacterium tuberculosis, the Rv1460-Rv1461-Rv1462-Rv1463-csd-Rv1465-Rv1466 operon (suf operon) encodes the primary Fe-S cluster biogenesis system. Rv1460 encodes a probable transcriptional regulator with homology to SufR, which regulates suf operon expression in cyanobacteria. In this study we investigated the function of Rv1460 by generating a M. tuberculosis Rv1460 truncation mutant, and characterising recombinant Rv1460 protein. An M. tuberculosis mutant, Rv1460stop, that produces a non-functional, truncated form of the Rv1460 protein, was generated by two-step allelic exchange. The strain was complemented by introducing a native copy of Rv1460 at the attB site. Loss of Rv1460 was associated with impaired growth under standard culture conditions and increased susceptibility to oxidative stress. RT-qPCR analysis confirmed that Rv1460 functions as a repressor of the suf operon, analogously to SufR. Electrophoretic mobility shift assays, using purified recombinant Rv1460, indicated that Rv1460 regulates the suf operon by binding in the Rv1460 promoter region and within Rv1461. This study provides the first insights into the regulation of Fe-S cluster biogenesis in M. tuberculosis by Rv1460.

ABSTRACT NUMBER / ABSTRAKNOMMER: 53

FEASIBILITY, UPTAKE AND YIELD OF HOUSEHOLD-BASED TUBERCULOSIS ACTIVE CASE FINDING WITHIN THE COMBINATION PREVENTION PACKAGE IN THE HPTN 071 (POPART) INTERVENTION IN HIGH TB/HIV BURDEN COMMUNITIES IN SOUTH AFRICA.

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ROSA SLOOT (DESMOND TUTU TB CENTRE, STELLENBOSCH UNIVERSITY)
SAM GRIFFITH (FHI360)
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Background: HPTN 071 (PopART) is a community-randomized trial of a combination HIV prevention intervention, which includes home-based HIV testing and tuberculosis (TB) screening, delivered in three annual rounds by Community HIV-care Providers (CHiPs) in Zambia and South Africa. We evaluated the feasibility, uptake and yield of household-based TB active case finding (ACF) within a combination HIV prevention intervention. Methods: We report data from the second annual round (June 2015-August 2016) from six South African communities. Adults (≥18 years) that consented to participate were eligible for TB screening if not on TB treatment. CHiPs administered electronic TB screening questionnaires (weight loss, cough ≥2 weeks, night sweats) and enquired about persons with TB in the household or at work. Two sputum specimens were collected from adults with presumptive TB (≥1 symptom or in contact with TB). Diagnosis of bacteriologically confirmed pulmonary TB (PTB) was based on Xpert MTB/RIF®, smear microscopy, or culture. PTB cases were

referred to the local health care facility for treatment. Multivariable logistic regression was used to determine the association of sex and age with different outcomes within the TB cascade of care. Results: 103,455 adults were eligible for TB screening. 101,630/103,455 (98%) adults received TB screening (43% males, median age 31 years). 2,709/101,630 (3%) were presumptive TB cases. 2,263/2,709 (84%) were followed up. 167/2,263 (7%) were PTB cases. 143/167 (86%) initiated TB treatment. Adults aged ≥55 were more likely to be presumptive TB cases compared to younger age groups (P-value<0.01). Females were less likely to be presumptive TB cases (aOR 0.78, 95%CI 0.720.84) and less likely to be diagnosed with PTB (aOR 0.67, 95%CI 0.490.93) compared to males. Conclusions: ACF through household TB screening within a combination HIV prevention intervention is feasible. CHiPs were able to identify undiagnosed cases in the community and refer adults for treatment.

ABSTRACT NUMBER / ABSTRAKNOMMER: 54

STRATEGIES DEVELOPED TO IMPROVE LINKAGE TO HIV CARE OF NEWLY DIAGNOSED CLIENTS FROM THE HPTN 071 (POPART) INTERVENTION IN SOUTH AFRICA.

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Background: HPTN 071 (PopART) is a community-randomised trial of a combination of HIV prevention intervention, which includes home-based HIV counselling and testing and referral for linkage to HIV care and initiation of anti-retroviral therapy (ART). We report on the challenges, strategies, and outcomes identified in the process of linkage to HIV care of newly diagnosed HIV-infected clients referred by CHiPs. Methods: We report from the second annual round (June 2015–Aug 2016) from 6 South African communities from meetings held between the managers and the CHiPs to discuss the challenges of linkage to HIV care of their clients, identify strategies to overcome these challenges, and the outcomes of these strategies. Results: Challenge 1: Some clients reported to CHiPs that they felt healthy and did not feel the need to link to HIV care or initiate ART. Strategy 1: CHiPs provided active individualized care plans with additional follow ups to homes and an accompanying Professional Nurse gave further counselling. Outcome 1: Clients shared that they had a better understanding of HIV care and the importance of initiating ART. Challenge 2: Some of the clients needed additional counselling related to substance abuse, intimate partner violence and other social challenges. Strategy 2: Identified Professional Nurses who could provide this counselling in which they accompanied CHiPs to the homes of these clients. Outcome 2: Clients reported that they felt that we cared about the social challenges in their lives and not just about their health. Conclusion: This approach adopted by both managers and CHiPs to identify challenges and develop strategies improved linkage to HIV care and provided additional support for newly diagnosed clients. We recommend health care workers who are working in the community to use a variety of strategies to facilitate the process of linkage to HIV care for clients.

ABSTRACT NUMBER / ABSTRAKNOMMER: 55

ATTRITION AND RETENTION IN THE STEPS OF TRAINING TO BECOME AN HIV LAY COUNSELLOR FOR COMMUNITY HIV-CARE PROVIDERS IN THE HPTN071 (POPART) IN SOUTH AFRICA

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HPTN 071 (PopART) is a community-randomized trial of the impact of a combination prevention package on population-level HIV incidence in Zambia and South Africa. Communities were randomized into three arms. Arm A - intervention with immediate ART; Arm B - intervention with ART according to guidelines, Arm C - no intervention and ART according to guidelines. The intervention consists of home-based HIV counselling and testing, linkage to HIV care, initiation of ART according to Arm A and B. Individuals with Grade 12 went through CV selection, an interview, and were hired as Community HIV-care Providers (CHiPs) going door-to-door delivering the intervention. CHiPs were trained through an accredited training service provider on HIV testing services and conducting an HIV rapid test. We report the process of attrition and retention from recruitment to completion of training for all 6 sites from August 2015 to September 2016. The training consisted of nine days of theory and one day finger-prick training. After training CHiPs complete practicals of workplace assignments and hand in Portfolio of Evidence (POE) for assessment to the accredited training service provider. External auditors review the POE to assess the following 4 components: Basic; HIV/AIDS pre and post-test counselling; Support and counselling to people infected and affected with HIV/ AIDS; Finger prick testing. 75 CHiPs enrolled. 5/75 Resigned after completing training due to ill health and better job opportunities. 70/75 Completed training, started with their practicals in the community; 70 turned in a POE. 4/70 Failed minimum requirements for certification. 66/70 became certified HIV lay counsellors (CHiPs). The highest attrition step is after training before going into the community for practicals and the second highest attrition step is with not passing the assessment of Portfolio of Evidence to obtain the certificate to become an HIV lay counsellor.

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Theme 3 / Tema 3

*V*iolence, *I*njuries, *T*rauma and *R*ehabilitation/

*G*eweld, *B*eserings, *T*rauma en *R*ehabilitasie

Oral Presentations/ Referate

ABSTRACT NUMBER / ABSTRAKNOMMER: 1

Complications assosciate with Hexapod fixation of Tibia fractures

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Hexapod ring fixators are used more frequently in the management of acute limb trauma. There is limited data available in the literature on the complications and union rates associated with this treatment method. Aim: To stratify the complications and union time of different types of acute tibia fractures treated with hexapod ring external fixators at a high volume trauma center. Method: We retrospectively reviewed medical records and x-rays of all hexapod fixators used to treat acute tibia fractures at our institution between 2012 and 2015. Data included demographic details, mode of injury, complications and final radio graphic outcomes. Descriptive statistics were used to analyze group data. Results: 202 cases were included in the review. The average age was 37.9 years. There were 39 Intra-articular, 100 Meta-diaphysial, 63 diaphysial and 42 complex fracture patterns. Modes of injury included 119 road traffic injuries, 24 gunshots, 25 high energy falls and 22 sustained direct traumas. Complications includes: pin track infections in 52.5%(67% was low grade), 23% wound complications including 14% deep tissue infection, and joint contractures occurred in 47 cases. The mean time to union was 7.018 months (Std.Dev 3.45) with a union rate of 85%. 20 patients developed a mal-union and 2 patients ended with an amputation. 87% of united fractures had an accurate alignment at final review x-ray. Conclusion: Complications occur frequently with hexapod ring fixation of tibia fractures. Union and adequate final alignment can be expected in the majority of cases despite the frequency of complications.

ABSTRACT NUMBER / ABSTRAKNOMMER: 2

The effectiveness of kinesiology taping combined with physiotherapy in adults with post-mastectomy lymphedema compared to physiotherapy alone to decrease limb size and pain as well as improve shoulder range of motion and HRQOL

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"BackgroundLymphedema is defined as swelling of the upper limb or breast due to dysfunction in the lymphatic system which results in an altered lymphatic flow. The function of the lymphatic system is impaired following breast cancer treatment, namely mastectomy and removal of the lymph nodes. This systematic review addresses the effect of KT in combination with physiotherapy in patients with post-mastectomy lymphedema compared to physiotherapy alone. To date, no systematic review has been undertaken.ObjectivesTo critically appraise and evaluate the effects of KT combined with physiotherapy compared to physiotherapy alone to reduce upper limb size and pain and to improve shoulder range of motion and HRQOL.MethodologyThe following seven computerised bibliographic databases, accessed via the Stellenbosch University Library and Information Service, were searched: Cochrane Library, EBSCOHost: CINAHL, PEDro, ProQuest, PubMed, Science Direct and Scopus. The main search terms used were "Post-mastectomy lymphedema", "lymphedema", "Kinesiology taping", "KT taping", "K-tape", "Physiotherapy therapy", Physical Therapy", "Complex Decongestive Therapy (CDT)", "Pneumatic Compression" and "Manual Lymphatic Drainage". The quality of the trials was critically appraised using the PEDro scale. ResultsDue to the heterogeneity of the studies, pooling of the results could not commence, leading to a narrative conclusion. The intervention (KT combined with physiotherapy) illustrated better short and long-term effects for both the reduction in pain and upper limb size (swelling/volume). In contrast to the former, ROM and HRQOL improved more in the control group (physiotherapy alone). Conclusion There is level II evidence to suggest that the use of KT and physiotherapy combined is more beneficial in reducing upper limb size and pain when compared to physiotherapy alone. Long term effects for these two outcomes were only found in two

studies. An improvement in upper limb ROM and HRQOL was found to be better in the groups receiving physiotherapy alone."

ABSTRACT NUMBER / ABSTRAKNOMMER: 3

Low cost, easy to use tools to measure kinematics in amputees

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The use of running specific prosthetics (RSP) have become more common amongst persons with lower limb amputations, and as such the need to monitor the influence of these prosthetics and their impact on gait is essential in order to prevent injury. It has previously been found that differences in the characteristics of the prosthetics lead to differences in the resultant output of the prosthetic which would have an impact on the kinematics of the wearer (Grobler et al., 2017). This study aimed to determine the validity of different methods of monitoring kinematics in athletes with lower limb amputations. In this study Kinovea a video analysis software was compared to a force plate, which is seen as the gold standard in order to determine the validity of these equipment. Four stiffness categories of two RSP models were tested at seven alignment setups. Results for contact time (tc) and flight time (tf) were determined during controlled dropping of RSPs onto a force plate, while simultaneously measuring with a high speed camera. Furthermore, Optogait and Kinovea was compared during treadmill running with four different RSPs in a unilateral transtibial amputee. The result indicated strong validity between Kinovea and Optogait for both contact (ICC = 0.99) and flight time (ICC = 0.98) inidcating that these two can be used interchangebly in treadmill running for athletes with lower limb amputations. These results prove that low cost equipment can be a valid solution for clinicians wanting to track rehabilitation progress in athletes with lower limb amputations, specifically pertaining to measurements relating to the prosthetic.

ABSTRACT NUMBER / ABSTRAKNOMMER: 4

Using Mixed Methods design to understanding the implications of context and personal experiences: Xhosa women with stroke in rural and urban settings

Marlie Enright (Stellenbosch University - Physiotherapy)

Using Mixed Methods design to understanding the implications of context and personal experiences: Xhosa women with stroke in rural and urban settingsBackgroundThe complex interaction between a person and their context, and their resulting experience of disability, are still poorly understood (Pettersson, Pettersson & Frisk, 2012). For healthcare and rehabilitation professionals to deliver accessible and appropriate services, it is essential that they understand healthcare users and their context (Jellema et al., 2016). MethodsThis is a descriptive, cross-sectional study, which used a convergent mixed methods design. Qualitative data was collected through semi-structured interviews. Quantitative data was obtained by using a self-developed Demographic and Environmental questionnaire, the Barthel Index and EuroQol-5D.FindingsThe median age for the rural participants was 42 years (24-72) and 56 years (31-65) for urban participants. The triangulation of quantitative and qualitative data describes three emerging themes relating to the personal experiences of study participants and how these theme relate to participants quantitative data for Health Related Quality of Life (HRQoL) and independence in activities of daily living (ADL's).ConclusionThis study highlights the importance of using mixed methodology design and triangulation of different data sets to give a rich describe the participants context, experiences and healthcare needs of women with stroke. The study finding could assist with the alignment, development and implementation of appropriate services in low-socio economic areas for people with stroke.

ABSTRACT NUMBER / ABSTRAKNOMMER: 5

SPORT, GENDER AND AGE INCREASE RISK OF ILLNESS AT THE RIO 2016 SUMMER PARALYMPIC GAMES: A PROSPECTIVE COHORT STUDY OF 51,198 ATHLETE DAYS

Phoebe Runciman (Institute of Sport and Exercise Medicine - Surgical Sciences)

Objective: To describe the epidemiology of illness at the Rio 2016 Summer Paralympic Games.Methods: A total of 3657 athletes from 78 countries, representing 83.5% of all athletes at the Games, were monitored on the WEB-IISS over 51, 198 athlete days during the Rio 2016 Summer Paralympic Games. Illness data were obtained daily from teams with their own medical support through the WEB-IISS electronic data capturing systems.Results: The total number of illnesses reported was 511, with an illness incidence rate (IR) of 10.0 per 1000 athlete days (12.4% of all athletes). The highest IRs were reported for wheelchair fencing (14.9), Para swimming (12.6) and wheelchair basketball (12.5) ($p < 0.05$). Female athletes and older athletes (aged 35-75) were also at higher risk of illness (both $p < 0.01$). Illnesses in the respiratory, skin and subcutaneous and digestive systems were the most common (IRs of 3.3, 1.8 and 1.3, respectively).Conclusion: The medical data recorded on the WEB-IISS in this study show that 1) the rate of illness was lower than that reported for the London 2012 Summer Paralympic Games, 2) the sports with the highest risk were wheelchair fencing, Para swimming and wheelchair basketball, 3) female and older athletes (35-75 years) were at increased risk of illness, and 4) the respiratory system, skin and subcutaneous system and digestive system were most affected by illness. These results would allow for comparative data to be collected at future editions of the Games and can be used to inform illness prevention programs.

ABSTRACT NUMBER / ABSTRAKNOMMER: 6

EFFECT OF VIRTUAL REALITY, IN CONJUNCTION WITH STANDARD ANALGESIA, ON PAIN, ANXIETY AND RANGE-OF-MOTION IN PATIENTS WITH BURN INJURIES UNDERGOING PAINFUL PROCEDURES COMPARED TO STANDARD ANALGESIA ALONE: A systematic review

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Objective To conduct an updated search of the literature, identify, critically appraise, and evaluate the current evidence regarding the effectiveness or VR, in conjunction with standard analgesia, on pain, anxiety and ROM during wound dressing changes and physiotherapy management which patients with burn injuries have to undergo, compared to standard analgesia.MethodologyA comprehensive search was conducted from seven electronic databases. Articles published in English, which met specific inclusion criteria, were considered for this review. Methodological quality was appraised using the PEDro scale. For homogenous data, RevMan 5© software was used to pool results from the included articles and illustrate the combined data in the form of a forest plot. Heterogeneous data was narratively reported. ResultsNine articles, conducted between 2005 and 2014, were deemed eligible for inclusion in this systematic review. The articles had an average PEDro score of 6.67/10 and were conducted in developed countries. Results of the meta-analyses indicate a statistically significant reduction in pain when using VR in conjunction with standard analgesia during burn wound care ($p=0.0007$). Significant differences for pain during physiotherapy, anxiety and ROM were not found, ($p>0.05$) although VR, as an adjunct to standard analgesia was favoured. ConclusionThe findings of this updated systematic review suggest that VR in conjunction with analgesia significantly reduces pain during burn wound care, reduces pain during physiotherapy management of burn injuries and reduces anxiety and ROM in patients who have suffered burn injuries during wound care and physical therapy interventions.

ABSTRACT NUMBER / ABSTRAKNOMMER: 7

The Epidemiology and impact of hospitalized ophthalmic trauma in East London, South Africa

Dr. Michael K. G. Djan (Stellenbosch University/Tygerberg Hospital - Division of Ophthalmology), Dr. Robyn M. Rautenbach (Stellenbosch University/Tygerberg Hospital - Division of Ophthalmology)

Aim: To describe the current epidemiology of moderate and serious ocular trauma warranting hospitalization in an effort to aid better health and safety strategies at local and national levels.Methods: A retrospective case series of all patients with ocular trauma admitted to the East London Hospital complex under the care of a consultant ophthalmologist over a period of 7 months (1 July 2015- 31 January 2016). All ophthalmic trauma patients admitted during the study period were assessed for causality, illicit substance associations, perpetrator relation, setting, nature and severity of trauma, length of hospitalization, injury-to-hospital presentation intervals and admission-to-surgery intervals, where appropriate. The injuries were classified by the Ocular Trauma Scores (OTS) system and the Birmingham Eye Trauma Terminology (BETT). Results: 152 patients (154 eyes) were hospitalized with ocular trauma during the 7-month study period. There were significantly more males than females (4,9:1). The mean age of males and females were 27,8 (± 15,09) years and 25 (± 20,16) years, respectively. The household environment was the most frequent setting for ocular trauma (46,7%; n=70) . Non-accidental injuries (NAI) were associated with alcohol abuse in 83% (n=79) of cases. Seventy five percent (n=72) of all perpetrators in NAI were well known to their victims. There was a high correlation between alcohol abuse and NAI (P<0.0001). The ratio of open globe injuries (59%, n=90) to closed globe injuries (41%, n=62) was 1,45:1. The most frequent offending objects were from knives (n=34) and glass bottles (n=24). The mean hospitalization period was 3,3 (± 3.1) days.Conclusion: Current eye care awareness and trauma prevention programs should prioritize high risk groups, alcohol abuse and home-related injuries to curb the high rates of severe ophthalmic trauma.Keywords: Ophthalmic trauma, epidemiology, open globe injuries

ABSTRACT NUMBER / ABSTRAKNOMMER: 8

Supported Employment: Components and Utilisation

Lana van Niekerk (Stellenbosch University - Occupational Therapy), Madri Engelbrecht (Stellenbosch University - Occupational Therapy), Santie Terreblanche (Workshops Unlimited), Zelda Coetzee (Stellenbosch University - Occupational Therapy), Zerina Hajwani (Stellenbosch University - Occupational Therapy)

Background: Strong evidence points to supported employment as an effective strategy for employment of persons with disability. The feasibility of supported employment in resource-constrained environments has not been established. The presentation will focus on parts of a study that was undertaken to determine the feasibility of supported employment as a work-integration strategy for persons with disability in resource-constrained contexts. Methodology: A two-staged project was undertaken to determine the components that comprise supported employment services offered in South Africa and to determine the utilisation of supported employment over a one year period for persons with mental disability (i.e. psychiatric or intellectual disability). Conclusions: Supported employment comprise a range of components, that will be shared in the presentation. Trends in services utilised revealed a sharp decrease after the first month, making supported employment a potentially feasible service.Recommendations: The time utilisation patterns could be used to estimate cost and thus contribute to determining the feasibility in our context. Potential costing sources and structures should be considered.

ABSTRACT NUMBER / ABSTRAKNOMMER: 9

The use of computed tomographic angiography in the evaluation of upper digestive tract injuries in penetrating neck trauma.

Jan Paul Barnard Maritz (University of Stellenbosch/ Tygerberg Hospital - Surgery)

IntroductionPatients who present with penetrating neck injuries undergo both a computed tomographic angiogram (CTA) of the neck to diagnose vascular injuries and a contrasted swallow to diagnose aerodigestive tract injuries. In a resource constrained setting this algorithm is questionable.Aim We performed an audit to assess the diagnostic accuracy of CT angiography to exclude upper digestive tract injuries.MethodsA chart review was performed of all patients who presented to Tygerberg Hospital's trauma unit with penetrating neck injury between 1 January 2013 and 1 January 2016. All unstable patients taken directly to theatre were excluded. The hemodynamically stable patients underwent both a CTA and contrasted swallow. All the CTA's were performed prior to contrast swallow and reported by a consultant radiologist.ResultsOf 906 patients, 825 (91%) had stab and 81 (9%) gunshot wounds. Thirty-three (3.6%) patients were diagnosed with upper digestive tract injuries on contrasted swallow. 24 patients had pharyngeal injuries and 9 patients had oesophageal injuries. CTA was suspicious of injury in 16 patients and diagnostic of injury in 4 patients. In 12 CTA scans performed there was no mention of upper digestive tract evaluation. 1 CTA was falsely negative for injury when compared to contrast swallow.ConclusionCTA reporting does not consistently evaluate the upper digestive tract for injuries. This might be due to reliance on contrasted swallows for diagnosis. There needs to be implementation of standardised reporting on the upper digestive tract when evaluating CTA's for penetrating neck injuries. Further evaluation of the diagnostic accuracy of CTA is needed before contrasted swallows can be omitted in the absence of upper digestive tract injury as suggested by CTA.

ABSTRACT NUMBER / ABSTRAKNOMMER: 10

THE EFFECTIVENESS OF CONTRAST WATER THERAPY ON DELAYED ONSET MUSCLE SORENESS VERSUS PASSIVE RECOVERY IN PERFORMANCE AND RECREATIONAL ATHLETES: A SYSTEMATIC REVIEW WITH META- ANALYSIS

Anika Janse van Vuuren (Stellenbosch University - Department of Physiotherapy), Annabelle van der Watt (Stellenbosch University - Department of Physiotherapy), Heleen van Zyl (Stellenbosch University - Department of Physiotherapy), Marizé van Molendorff (Stellenbosch University - Department of Physiotherapy), Mart-Marié Lombard (Stellenbosch University - Department of Physiotherapy), Nadia Reuter (Stellenbosch University - Department of Physiotherapy), Simoné le Roux (Stellenbosch University - Department of Physiotherapy), Tyla-Jade Voorhout (Stellenbosch University - Department of Physiotherapy)

"BACKGROUNDDelayed onset muscle soreness (DOMS) is a common condition, characterised by tenderness or stiffness to palpation or movement, influencing recreational and performance athletes' ability to participate and return to sport. Contrast water therapy (CWT) is a recovery intervention aimed to reduce DOMS. The evidence regarding the effectiveness of CWT for DOMS is inconclusive. OBJECTIVETo systematically source, critically appraise and evaluate the efficacy of CWT on DOMS, in comparison to passive recovery, in recreational and performance athletes.METHODOLOGY Seven computerised databases were accessed from July 2016 until March 2017 via the Stellenbosch University Library and Information Service, namely: PubMed, Cochrane Library, PEDro, ScienceDirect, Scopus, EBSCO: SPORTDiscus, EBSCO Host: CINAHL and pre-CINAHL. The main search terms were "contrast water therapy" and "delayed onset muscle soreness". Specific inclusion and exclusion criteria were applied. The PEDro scale was used to assess the methodological quality of the clinical trials included. Data was extracted and summarised using tables and analysed in a narrative form (heterogeneous data) or pooled in a meta-analysis (homogenous data).RESULTSThe search yielded four studies that qualified for this review, which were all randomised control trials (RCTs) with PEDro scores ranging from 4/11 to 9/11. The outcome measures used include: perceived

muscle soreness, serum creatine kinase (CK) concentration, mid-thigh circumference and volume, joint range of motion (ROM) and flexibility and muscle strength. The results of the effect of CWT were found to be significant on perceived muscle soreness ($p=0.02$) and mid-thigh volume ($p<0.01$), while seen to be insignificant on CK concentration ($p=0.21$), mid-thigh circumference ($p\leq0.05$) flexibility/ROM and muscle strength ($p<0.01$).CONCLUSIONBased on the pooled results, evidence suggests that CWT was clinically superior to passive recovery in decreasing DOMS with regards to VAS scores, while the overall effect of CWT was not more effective in decreasing DOMS than passive recovery. "

ABSTRACT NUMBER / ABSTRAKNOMMER: 11

First metatarsal reconstruction using a pedicled reverse flow peroneal artery based fibular osteocutaneous flap

Mosadi Mahoko (Stellenbosch University - Division of Plastic and Reconstructive Surgery)
Introduction:Injuries to the foot pose a frequent reconstructive challenge and often necessitate the use of free tissue transfer. The vascularized free fibular flap for bony defects is well described. We present two cases of a distally based, pedicled peroneal artery fibular osteocutaneous flap for complex midfoot reconstructionMaterial and Methods:Two patients (aged 29 years and 6 years) who had sustained trauma to the foot dorsum were referred to the Tygerberg Hospital Plastic and Reconstructive Surgery unit in 2009 and 2016, respectively. They presented with a loss of first (and second in the adult patient) metatarsal bone as well as an overlying skin defect Both underwent a pedicled fibular flap reconstruction with a soft tissue island to cover the defect (8x5 cm in the young patient, adult size of defect not documeneted). Intramedullary Kirchner wire fixation was utilized to stabilize the fibula. Results:Patient 1 required sequestrectomy of the fibula but maintained viability of the overlying soft tissue. She was able to walk without an assistive device at 3 years follow up with a good plantar grade foot. Patient 2 is now two moths post surgery with no signs of sepsis, bone necrosis or resorption. Kirchner wires are still in place and he is weight bearing well with intact medial and lateral plantar arches. Both flaps showed initial venous congestion which resolved post operatively.Conclusion:The reverse flow peroneal artery based fibular osteocutaneous flap is a viable option for complex midfoot reconstructions with a good functional and cosmetic outcome.

ABSTRACT NUMBER / ABSTRAKNOMMER: 12

THE EFFECT OF WHOLE BODY VIBRATION AND PHYSIOTHERAPY COMPARED TO PHYSIOTHERAPY ALONE ON SPASTICITY AND FUNCTION IN PERSONS WITH CEREBRAL PALSY: A SYSTEMATIC REVIEW

Sumeri Tromp (Physiotherapy Division - Department of Health and Rehabilitation Sciences), Sumé Matthysen (Physiotherapy Division - Department of Health and Rehabilitation Sciences), Nicolise Goosen (Physiotherapy Division - Department of Health and Rehabilitation Sciences), Marlia Fivaz (Physiotherapy Division - Department of Health and Rehabilitation Sciences), Herné Rautenbach (Physiotherapy Division - Department of Health and Rehabilitation Sciences)

BACKGROUNDWhole body vibration is an intervention strategy gaining popularity in cerebral palsy to improve mobility and independence. This modality has been shown to affect spasticity, a primary impairment and a strong contributor to the dysfunction seen, however the results are conflicting. This systematic review aims to determine the effect of WBV on spasticity in CP.OBJECTIVETo critically appraise, evaluate and establish the best available evidence for the effectiveness of WBV in combination with physiotherapy in comparison with physiotherapy alone in the management of spasticity and function in people with CP. METHODOLOGYSeven computerised databases accessed through the Stellenbosch library were searched. The main search terms included: cerebral palsy, spasticity, hypertonia, whole body vibration, physiotherapy and physical therapy. Included articles had no meet specific criteria.The articles were critically appraised according to the PEDro scale. The adapted "JBI Data Extraction Form" was used to extract data from the included articles. Results are presented in narrative form.RESULTSFour RCTs qualified for this review which scored around 50% on

the PEDro Scale. There is moderate to weak evidence that WBV can decrease spasticity in the quadriceps, hamstrings and soleus muscles in CP. In other muscle groups, no change in spasticity was found. Two studies showed significant reduction in spasticity in the stronger limb, while one study reported a significant reduction in the weaker limb when the two limbs were compared. Similarly, for gross motor function there was moderate to weak evidence that WBV can improve activities such as standing, walking, running and jumping.CONCLUSIONThere is level II evidence suggesting that WBV in combination with physiotherapy may be more effective than physiotherapy alone to reduce spasticity in selected muscles/muscle groups and improve gross motor function. Whether the effects on spasticity and function are maintained in the long term, needs further exploration.

ABSTRACT NUMBER / ABSTRAKNOMMER: 13

Correlations of skull measurements and post-cranial measurements: a skeletal study on males of a South African population.

Johan Christian Marais (Division of Anatomy and Histology - Department of Biomedical Sciences), Amanda Albblas (Division of Anatomy and Histology - Department of Biomedical Sciences), Linda M. Greyling (Division of Anatomy and Histology - Department of Biomedical Sciences)

In forensics anthropology it is sometimes necessary to resolve the number of individuals within comingled remains from mass graves or mass disasters. Individuals are sorted by means of visual pair-matching, the process of elimination, articulation, taphonomy, DNA sequence data and osteometric comparison. By using metric comparison techniques this process of segregation is supported by statistics and eliminates observational bias to a large degree.This study aimed to assess correlations between various measurements within the cranium and post-cranial aspects to provide a basis for skull-body matching and derive regression models for the strongest correlations.South African Coloured male skeletons from the Kirsten Skeletal Collection (n=50) were assessed in terms of 25 skull and 18 post-cranial measurements, which included measurements from the long bones, of the vertebral canal, and articular components of the skull. The highest correlation coefficients were seen between the maximum vertebral foramen length (MVFL) of C1 with the MVFL of C2 and the foramen magnum length (FOL). C1MVFL=FOL(0.06233) +8.118 is the most accurate when using single regression. Weaker correlations were seen for the averaged cranial cord lengths with the fibular length, basion-bregmatic-height with tibial length, and the articular facet lengths of C1 with the ipsilateral occipital condyle lengths.The high correlation of the vertebral foramen size of C1, C2 and the foramen magnum, with intermediate correlation of the C0-C1 joint facets shows that it is possible to use osteometric comparison of skeletal elements to match a skull with a body, in cases where full disarticulation of the skull has occurred.

Posters/ Plakkate

ABSTRACT NUMBER / ABSTRAKNOMMER: 14

MEASURING THE EFFECT OF FATIGUE ON DRIVING PERFORMANCE IN EMERGENCY WORKERS IN THE CAPE METROPOLE: A DRIVING SIMULATOR STUDY

Danielle Steyn, Nika Grobler, Ragmaah Fredricks, Yentl Viljoen (University of Stellenbosch - Health Scieces)

Purpose – Shift work and long continuous hours of work may contribute to impairments in physical, cognitive, and emotional functioning. Such impairments may impact on driving, which is a task that requires intact cognitive functioning. Emergency service workers (EMS workers) are exposed to sleep

loss and they experience impairments as a result of fatigue due to working 12-hour shifts instead of a normal eight-hour work day. Driving is a key job task of EMS workers which enables them to reach emergency sites or situations. Therefore, it is essential to determine the degree to which fatigue affects EMS workers' driving performance. The purpose of the study was to measure the influence of fatigue on the driving performance of EMS workers in the Western Cape, South Africa after a 12-hour shift using a high fidelity driving simulator. Methodology – A cross-sectional comparative research design was used. The researchers tested the driving performance of 6 paramedic workers using a driving simulator after a 12 hour shift (fatigued state) and compared the results to a normative pilot study (rested state).

ABSTRACT NUMBER / ABSTRAKNOMMER: 15

Nasal morphology assessment of the three predominant South African ancestral groups

Cameron Clark Anthony Stuurman (Anatomy and Histology - Biomedical Science)

Forensic anthropologist routinely apply metric and non-metric methods to aid in ancestry estimation of unknown skeletal remains. Within the South African (SA) context, legislation implemented during the 20th century may have affected the genetic makeup of population groups to such an extent that differentiation of ancestral groups are possible. This study aimed to assess whether trait analysis of the nasal region, using metric and non-metric methods, is an effective approach to differentiation between the three predominant (Coloured, Black, and White) SA population groups.Analysis were conducted on the midface region of dry crania (n=196) with known sex, age at death and ancestry. These crania were obtained from two human osteological collections situated in the Western Cape, SA. Five non-metric traits and three metric traits were analysed. Results showed that four of the five non-metric traits, yielded statistical significant differences between the three examined groups. For the three metric traits, significant differences were found between all groups, for all traits assessed. The SA Coloured population had the most intra-population variation and was more closely related to the Black SA group with regards to the non-metric traits. The White population group had limited intra-population variation, which provides a basis for differentiating this group from the two other groups assessed. In conclusion, differentiation of these three groups are possible, despite the extent of overlapping population variation, when all traits are looked at in combination rather than conducting individual trait analysis. Keywords: Ancestry, nasal morphology, crania, metric method, non-metric method

ABSTRACT NUMBER / ABSTRAKNOMMER: 16

Quality of life of persons with complete traumatic spinal cord injuries in and around Gaborone, Botswana.

Beauty Kwadiba (Stellenbosch University - Centre for Rehabilitation Studies), Martha Geiger (Stellenbosch University - Centre for Rehabilitation Studies), Surona Visagie (Stellenbosch University - Centre for Rehabilitation Studies)

BACKGROUND: for persons surviving traumatic spinal cord injury, community reintegration is a multi-faceted challenge. While researchers here and there have explored the daily struggles and the lived experiences of discharged patients in different environments, more insights were needed in the given context. The PURPOSE of this study was to describe the individual experiences and quality of life of persons with traumatic spinal cord injury, after discharge from center-based rehabilitation and returning to their homes in and around Gaborone, Botswana.The OBJECTIVES were to explore (1) the persons' individual experiences since returning home; (2) barriers and facilitators to participation in their homes and communities and (3) the persons' individual coping strategiesMETHOD: A qualitative, phenomenological study design was applied. A pilot study was implemented to resolve practical and logistical challenges. Data were collected through home-based interviews and observations with a convenience sample of four participants, after discharge from the national rehabilitation center following traumatic spinal cord injury. Thematic content analysis was applied to the transcriptions of

the participants' responses; these were coded, grouped into categories and then into themes.FINDINGS: Six main themes covered: the impact of the spinal cord injury; access barriers; diverse experiences of government recognition of disability and support; financial and insurance issues; family support and community responses; and individual coping strategies.CONCLUSION: In the given context, there is a need for more, and deeper, direct engagement with, and decisive responses to, the needs and contributions of persons with spinal cord injury who have been discharged and who are endeavoring to re-integrate into their homes and communities. Implications and practical recommendations were identified for specific stakeholder groups.

ABSTRACT NUMBER / ABSTRAKNOMMER: 17

The Construct Validity of the Bishop Lavis Interest Checklist for use with Adults with Disabilities or Impairments receiving occupational therapy at the Bishop Lavis Rehabilitation Centre

Carla Bester, Suzanne du Toit, Jean-Marie Cilliers, Krista-Lee Koen, Minenhle Mthembu (Stellenbosch University - Occupational Therapy)

Introduction: Interest checklists are used as one assessment measure of leisure activity participation by occupational therapists internationally. Research conducted in 2014 adapted the Modified Interest Checklist to develop a measurement instrument with content validity for residents of Bishop Lavis. Objective: The aim of the current study was to follow-up on the previous research by investigating the degree of divergent and convergent construct validity of the Bishop Lavis Interest Checklist for use with adults with disabilities or impairments receiving occupational therapy at the Bishop Lavis Rehabilitation Centre. Methods: Testing the divergent validity of the BLIC, by measuring the relationship between number of interests and quality of life and the relationship between the number of interests and degree of disability. Testing the convergent validity of the BLIC by measuring the relationship between number of interests and level of depression; the relationship between level of participation and quality of life; and the relationship between level of participation and degree of disability. In this study number of interests and level of participation were measured by the BLIC. Level of depression was measured by the PHQ-9, quality of life by the WHOQOL-BREF and level of disability by the WHODAS 2.0. Convenience sampling was used to recruit adults with disabilities or impairments who were at the time attending or had in the past attended the Bishop Lavis Rehabilitation Centre.Practice Implications and Conclusion: This research informs occupational therapists working in Bishop Lavis about the validity of the instrument; informs researchers of the implications and considerations for future adaptations of the interest checklist for other populations, and lastly, contributes to the literature regarding the interests and participation of adults with disabilities or impairments in low socio economic contexts.

ABSTRACT NUMBER / ABSTRAKNOMMER: 18

The effect of a hand cycling exercise programme on the cardiopulmonary and cardiovascular fitness levels in people with spinal cord injuries: a systematic review and meta-analysis

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BACKGROUNDHand cycling is an exercise modality utilised in the rehabilitation of the spinal cord injury (SCI) patients. The cardiovascular and cardiopulmonary fitness levels are significantly reduced in people with spinal cord injuries (SCIs) due their sedentary lifestyle. To date, no systematic review has been conducted to determine if including a hand cycling exercise programme within rehabilitation enhances these parameters. OBJECTIVETo critically appraise the best available evidence for including a hand cycling exercise programme within a rehabilitation programme to improve cardiopulmonary

and cardiovascular fitness levels in people with SCIs.METHODOLOGYSeven computerised databases, were accessed through the Stellenbosch Library including Cochrane Library, PEDro, EbscoHost: CINAHL and pre-CINAHL, PubMed, Science Direct, Scopus and OT Seeker. The articles were appraised using the PEDro Scale and the adapted "JBI Data Extraction form" was used to extract data from the included articles. The Revman© Review Manager Software was used to combine the results of VO2peak (ml.kg.min) and POpeak (W), where the data was then illustrated in the form of forest plots. Statistical pooling of heart rate data was not possible due to the heterogeneity amongst methodologies and presentation of the results of the included studies.RESULTSFour studies were suitable for inclusion in this review. The pooled results showed that there was a statistically significant improvement in VO2peak (ml.kg.min) ($p<0.00001$) and POpeak (W) ($p=0.03$) of participants with SCIs when including hand cycling in a rehabilitation programme. CONCLUSIONIn conclusion, this systematic review and meta-analysis of Level IIA and IIB evidence suggest that hand cycling is beneficial in improving cardiopulmonary fitness levels when analysing POpeak (W) and VO2peak (ml.kg.min) as outcome measures. The outcome of this review highlights the credibility of including a hand cycling exercise programme within the rehabilitation process for people with SCIs.

Theme 4 / Tema 4

Non Communicable Diseases / Nie-oordraagbare Siektes

ORAL PRESENTATIONS / REFERATE

ABSTRACT NUMBER / ABSTRAKNOMMER: 1

Assessing the Appropriate Use of Transthoracic Echocardiography at a Regional Hospital

Karim Hassan (Stellenbosch University - Internal Medicine)

BackgroundEchocardiography is one of the most useful non-invasive cardiovascular investigations available to clinicians. However, its overutilization has led to a dramatic rise in healthcare costs over the past decade. It is with this in mind that the American College of Cardiac Foundation (ACCF) and the American Society of Echocardiography (ASE), along with other professional societies, published the Appropriate Use Criteria (AUC) for Echocardiography in 2007, which was subsequently updated in 2011. Worcester Hospital currently employs an open booking system for its echocardiography service. The nature of this system may lead to abuse of the service, whereby inappropriate or unnecessary investigations are requested. ObjectivesTo assess the appropriateness of requests for transthoracic echocardiograms at a regional hospital in the Western Cape, South Africa, and whether an open booking system leads to abuse of the service.MethodsA prospective, descriptive study was performed. A total of 208 consecutive patients were recruited over an 8-month period. Indications for transthoracic echocardiograms were classified as appropriate, inappropriate, uncertain or unclassifiable based on the 2011 ACCF/ASE AUC for Echocardiography.ResultsThe results showed that 81.3% of requests were appropriate, 13.5% inappropriate, 2.9% uncertain and 2.4% unclassifiable. Assessment of valvular function was the most common appropriate and inappropriate indication. ConclusionThe echocardiography service at Worcester Hospital appears to be utilised appropriately. As this service can offer valuable information to guide clinical decisions and patients' management, this highlights the need for further resources to be allocated, to avoid overburden on the service provider.

ABSTRACT NUMBER / ABSTRAKNOMMER: 2

A link between low ATM, myocardial insulin resistance and vascular dysfunction in obesity.

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Patients with the neurodegenerative disorder, Ataxia-telangiectasia, exhibit low or no expression of the ataxia-telangiectasia mutated (ATM) protein, a ser/thr kinase. They suffer from insulin resistance/type 2 diabetes mellitus, atherosclerosis and ischaemic heart disease. In rats, diet-induced obesity results in low ATM expression, the significance of which is unknown. We therefore embarked on a project to determine whether this low ATM expression impacts on myocardial physiology. Methods: Male Wistar rats were rendered obese and insulin resistant by diet (HFD) and compared to chow-fed controls (C). Measurements: OGTTs, biometric and biochemical parameters, adult cardiomyocyte insulin responsiveness and aortic contractility. A specific ATM inhibitor, KU60019, was used and protein expression determined by Western blotting. Results: (i) HFD lowered myocardial expression of ATM, IRS-1, PI-3K, PKB/Akt, AS160 and AMPK, intermediates in insulin signal transduction or glucose transport. (ii) Inhibition with KU60019 in control hearts mimicked these changes. (iii) HFD cardiomyocytes were insulin resistant: insulin-stimulated 2-deoxyglucose uptake 17.6±4.6 vs 27.5±3.2 pmol/mg prot/30min in C ($p<0.05$). (iv) KU60019 reduced insulin-stimulated 2-deoxyglucose uptake in C and HFD cells to 17±4.1 and 12.3±3.9 pmol/mg prot/30min respectively ($p<0.05$). (v) ATM regulated coronary flow, aortic contractility and relaxation. Responses differed between C and HFD. (vi) KU60019 increased nitric oxide production in endothelial cells. Conclusion: Although our current evidence does not prove a causal role of low ATM and myocardial dysfunction in

obesity yet, it strongly suggests that low ATM in obesity has the potential to precipitate myocardial insulin resistance as well as vascular dysfunction and therefore myocardial pathophysiology.

ABSTRACT NUMBER / ABSTRAKNOMMER: 3

Evaluation of the impact of the 5-week Hello to my Health Education Programme for diabetic patients, in the Breede Valley sub - district, Western Cape, South Africa.

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"The Hello to my Health (HTMH) education programme specifically targets diabetic patients and is presented over 5 weeks, in a fun-to-learn, no-reading and writing, easy-to-remember way. The objectives of the study were to measure and compare baseline and post intervention knowledge and practices, to determine the perceptions regarding the method of presenting the programme, to measure the impact of the HTMH programme on patient`s weight (BMI), blood pressure, blood glucose (HGT) and blood glucose control (HbA1c).A descriptive cross sectional study with an analytical component were conducted. Diabetic patients attending the programme at Worcester Community Day Centre from 2014 – 2016 were recruited. Baseline, week 5 and week 12 knowledge and practice questionnaire were completed. Weight, height, blood pressure and biochemical (HGT, HbA1c) parameters were collected. The study demonstrated a highly significant increase in knowledge from baseline to week 5 and from baseline to week 12 ($p<0.001$) and no significant change between week 5 and week 12 ($p=0.165$). Regarding milk, there was a statistically significant change in milk type over the 3 time points ($p=0.024$), meaning the rank increased (improved to healthier choices). Similarly, with bread there was a statistically significant change in the type of bread chosen over time ($p=0.015$) with the mean rank increasing over time from baseline to 5 weeks and then decreased slightly to 12 weeks. The study showed a statistically significant reduction in HbA1C from baseline to Week 12 and a highly significant ($p<0.001$) reduction in HGT over time. A highly significant ($p<0.001$) reduction in systolic blood pressure was seen over time and no significant change in diastolic blood pressure over time. The majority of the participants felt the information was well explained and easy to follow and they were able to remember and apply the information."

ABSTRACT NUMBER / ABSTRAKNOMMER: 4

An investigation into the effects of type 2 diabetes associated systemic inflammation on mesenchymal stem cell function in Black South African Women

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South Africa has the highest prevalence of obesity in sub-Saharan Africa, particularly in Black women (WHO: World Health Statistics, 2015). A large body mass index (BMI ≥30 kg/m2), excess abdominal fat mass and elevated circulating levels of inflammatory cytokines are all associated with the development of T2DM and its co-morbidities such as impaired tissue regeneration. Our study hypothesized that during disease progression, pro-inflammatory changes in the systemic environment contribute to a decline in the functional capacity of mesenchymal stem cells (MSCs). Forty seven (n=10 healthy lean; n=37 obese) reproductive aged (18-45 years) Black Xhosa women were recruited in this study. After completing lifestyle and dietary questionnaires, anthropometric measurements and a dual energy x-ray absorptiometry (DXA) scan was performed. Blood samples were collected and whole blood and/or serum were analysed for fasting blood glucose levels, total lipid profile and inflammatory biomarkers. Based on the outcome of metabolic measures, obese participants were divided into 3 groups: 1) healthy obese (n=11), 2) metabolic syndrome (n=19) and 3) T2DM (previously diagnosed) (n=7). For the in vitro experiments, MSCs (Poietics cell line) were exposed to patient-derived serum and changes in cellular viability, proliferation and migration capacity assessed using standard tissue culture techniques. Systemic inflammation was evident in the

healthy obese (CRP 29.8±8 pg/mL) and metabolic syndrome (CRP 50.8±24 pg/mL) participants. Data from in vitro experiments showed improved proliferation only in healthy lean participant serum treated MSCs, suggesting a possible association between systemic inflammation and the functional capacity of MSCs.Characterization of the patient population confirmed that participants were in different stages of disease progression and therefore justified our model for further in vitro experimentation. The impairment of endogenous MSCs due to long-term exposure to a pathological micro-environment may be a contributing factor to disease progression and the development of co-morbidities.

ABSTRACT NUMBER / ABSTRAKNOMMER: 5

Investigating Nutrition and Physical Activity Behaviour of Adolescents in the School Environment

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Introduction: Overweight and obesity in adolescents combined with low levels of physical activity raise public health concern for health of future generations. Overweight in children is a precursor of adult obesity which has many adverse effects on health. Aim: To assess the nutritional profile, obesogenic environment and physical activity (PA) behavior of adolescents in secondary schools in the Western Cape Province, South Africa. Methods: A descriptive, cross-sectional study was conducted in 9 secondary schools in the Cape Town Metropole. Demographics, anthropometric measurements, dietary intake, nutritional behaviour, physical activity levels and environmental factors were investigated. Results: A total of 911 grade 8 learners, 40.7% (n=371) boys and 59.3% (n=540) girls, participated. The prevalence of overweight and obesity was 16.2% (n=148) and 9% (n=82) respectively. Significantly more girls than boys were either overweight or obese (p=0.036). Boys had a significantly (p=0.000) higher PA score (2.56) compared to girls (2.32). Twenty-five percent (n=222) reported barriers to PA. Academic commitments (n= 71; 7.8%) and illness (n= 46; 5.1%) were the main barriers. Seven schools had a tuck shop, with 36% (n=329) of learners purchasing from the tuck shop daily. A quarter (27%) of learners skip breakfast daily, girls significantly more than boys (p<0.001). Overweight and obese boys consumed more fruit and vegetable servings (21,8±0,8 SE) than girls (19,4±0,6 SE) (p<0.02.); whereas overweight and obese girls consumed more fatty food servings per week (18,6±0,8 SE) than boys (15,4±1,1 SE) (p<0.02). Barriers to optimal nutritional choices were cost, access to healthy food and preferences of the learners. Conclusion: The high prevalence of obesity combined with suboptimal levels of PA and poor food choices is concerning. The school environment pose opportunities for improvements toward promoting healthy eating and PA. Priorities need to be established in order to curb obesogenic behaviours in high schools in the Cape Metropole.

ABSTRACT NUMBER / ABSTRAKNOMMER: 6

Residual renal function in chronic dialysis is not associated with reduced erythropoietin-stimulating agent dose requirements: a cross-sectional study

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Background: Anaemia is a very common problem in patients with end-stage kidney disease (ESKD) and treatment with erythropoietin-stimulating agents (ESA) has revolutionized its treatment. Residual

renal function (RRF) is associated with a reduction in ESA resistance and mortality in chronic dialysis. The primary aim was to establish whether RRF has an association with ESA dose requirements in ESKD patients receiving chronic dialysis. Methods: A single center, cross-sectional study involving 100 chronic dialysis patients was conducted from December 2015 to May 2016. Participants were divided into two groups depending on presence of RRF, which was defined as a 24-hour urine sample volume of ≥100ml. Erythropoietin resistance index [ERI = total weekly ESA dose (IU)/weight (kg)/haemoglobin concentration (g/dL] was used as a measure of ESA dose requirements. Results: There was no difference in ERIs between those with RRF as compared to those without (9.5 versus 11.0, respectively; P=0.45). Also, ERIs did not differ between those receiving haemodialysis as compared with peritoneal dialysis (10.8 versus 10.2, respectively; P=0.84) or in those using renin-angiotensin system (RAS) blockers as compared with no RAS blocker use (11.6 versus 9.2, respectively; P=0.10). Lower ERIs was evident for those with cystic kidney disease as compared to those with other causes of ESKD (6.9 versus 16.5, respectively; P=0.32) although this did not reach statistical significance. Higher ERIs was found in those with evidence of systemic inflammation as compared to those without (16.5 versus 9.5, respectively; P=0.003).Conclusions: There was no association between RRF and ESA dose requirements, irrespective of dialysis modality, RAS blocker use or primary renal disease. Keywords Residual renal function, erythropoietin resistance index, chronic dialysis, erythropoietin stimulating agent dose requirements

ABSTRACT NUMBER / ABSTRAKNOMMER: 7

A bidirectional Neurogenin-3 expression in Streptozotocin-induced diabetes associated with pancreatic duct ligation

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The re-emergence of Neurogenin-3 (Ngn3) expressing cells in various models of pancreatic injuries has given new impetus to explore the activities of precursor cells in the adult pancreas of a diabetic rat. We investigated the activities of Ngn3 as a response to pancreatic injury in male Wistar rats (n = 55) with a dose of streptozotocin (STZ) (60 mg/kg). Surgical pancreatic injury by duct ligation (PDL) was applied to the animals and observed for 48, 72 and 120 h. The control groups were either sham-operated (SDC) or not (NDC). The blood glucose levels (BGL) were evaluated and the pancreata assessed immunohistochemically for Ngn3 and insulin. The results showed a sharp decrease in BGLs in the experimental groups 5 h after the ligation and a steady increase thereafter throughout the study. There were Ngn3+ cells in all the control group, while in the experimental group Ngn3+ cells were absent on the portions P2 and P1 at 72 h and 120 h, respectively. In addition, Ngn3+ cells were found in the peri-pancreatic fat in all tissue portions in the study. The insulin expression index (E (i)) of P1 and P2 in experimental groups were statistically significantly higher compared to the control groups (NDC $p = 0.010$, SDC $p = 0.001$). When comparing P1 to P2 within the individual time period in the experimental groups, E (i) in P2 was statistically significantly high at 48 h and 120 h ($p = 0.010$ and $p = 0.049$, respectively). However, P1 had a higher E (i) compared to P2 at 72 h with no statistical significant difference ($p = 0.119$). We conclude that PDL induces Ngn3 activities in both portions of the pancreas from the point of ligature in the STZ diabetic rat.

ABSTRACT NUMBER / ABSTRAKNOMMER: 8

The prevalence and associations of hypogonadism in coloured males with type 2 diabetes

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Introduction:Hypogonadism occurs frequently in men with type 2 diabetes mellitus (T2D) and has been shown to independently impact quality of life and sexual function. Currently, the prevalence and impact of hypogonadism in the coloured male T2D population is not known.Methods: Fifty

consecutive coloured male patients attending TAH outpatients for T2D were included. Each participant completed an Androgen Deficiency of the Aging Male questionnaire (ADAM). Fasting morning blood samples were obtained for HbA1C, lipogram, total testosterone (TT), sex hormone binding globulin (SHBG) and creatinine. Repeat morningblood samples were taken in all subjects with low TT to confirmhypogonadism. Urine was collected for microalbumin and a protein/creatinine ratio. All participants underwent DXA for determinationof body fat and bone mineral density (BMD).Results: The mean age of the population and duration of T2D was53 and 13 years respectively with a mean HbA1C of 10.2%. Lackof libido was volunteered in 72% of subjects with 78% of subjectsreporting erectile dysfunction. Mean TT was 10.3 nmol/l and mean FT 0.223nmol/l. Thirty four percent had unequivocally low TT whilst 44% had TT values in the intermediate range. Thirty six percent of subjects had low FT. BMD was normal in all subjects. Low TT correlated significantly with duration of diabetes and HDL.Conclusions: Symptoms of sexual dysfunction occurred frequentlyas did low levels of testosterone in our population. However, therewas a poor correlation between clinical parameters and laboratoryhypogonadism.

ABSTRACT NUMBER / ABSTRAKNOMMER: 9

Green rooibos extract (Afriplex GRT) protects rat hearts against high-fat, high-caloric diet-induced comorbidities.

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Cardiovascular diseases (CVD) are the leading cause of death worldwide, constituting 31% of all annual global deaths (17.5 million people). This figure is aggravated by the presence of individual risk factors such as obesity and insulin resistance. Furthermore, the risk of coronary heart disease, ischemic stroke and type 2 diabetes increase as the severity of obesity increases. Aspalathus linearis (commonly known as rooibos) is a plant indigenous to South Africa's fynbos area. Rooibos contains bioactive phenolic compounds such as aspalathin, a C-linked dihydrochalcone glucoside unique to rooibos, implicated as one of the main contributors of rooibos' antioxidant potential. In this study, a green rooibos extract (Afriplex GRT), rich in aspalathin, was used as an intervention in treating cardiometabolic disease risk factors induced by a high-fat, high-caloric diet (HCD) in rats. GRT was set in jelly cubes at 60mg/kg/day and fed to each animal individually. HCD led to symptomatic increase in body weight (368.6±6.5 vs 394.4±6.1 = 9.6% increase) and visceral adiposity (14.5 vs 23.1 = 59.0% increase) compared to age-matched control animals. HCD consistently consumed more food and less water compared to controls, whereas GRT showed no influence. Pre-ischemia, GRT supplementation improved the heart's total work performance compared to both untreated controls (13.5±0.4 vs 11.6±0.3) and untreated HCD (11.70±0.3 vs 10.3±0.2). Post-ischemia, HCD hearts had poorer aortic output recovery after reperfusion (42.1±3.2% vs 53.7±2.7%) compared to controls, and supplementing HCD with GRT completely recovered aortic output (53.1 ±3.5%) to that of controls. Likewise, HCD hearts had poorer coronary output recovery after reperfusion (60.2±2.6% vs 69.2±2.6%), and GRT treatment restored coronary capacity (72.7±3.7%) to that of controls. This preliminary study shows that GRT supplementation is able to negate negative outcomes induced by cardiometabolic risk factors pertaining to heart function and heart recovery post ischemia.

ABSTRACT NUMBER / ABSTRAKNOMMER: 10

Describing Occupational Therapy competencies for management of workers with Carpal Tunnel Syndrome (CTS) in the clothing industry, Cape Metropole

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Occupational therapy services rendered within clothing factories in the Cape Metropole is a recent occurrence. Students are trained in clinical health settings to manage CTS, but not in the factory setting. To sustain with a successful occupational therapy service in the clothing industry, it is essential that relevant competencies for practice in the clothing industry be identified, and developed by undergraduate students during their practice learning placements. The objectives are to explore the competencies participants used when providing an occupational therapy service to workers diagnosed with carpal tunnel syndrome in clothing factories, in the Cape Metropole. Secondly to describe the competencies identified as being central to the successful management of workers with carpal tunnel syndrome in clothing factories. The researchers will be following ethnography within qualitative research. The phenomenawill be from the occupational therapist's point of view. The study population consists of two practitioners, identified through convenience sampling, who initiated and implemented the occupational therapy service in the clothing industry, at different stages of implementationover a four-year period. Data will be collected using semi-structured interviews. The researchers will conduct non-participant observation within the clothing factory to gather data about the work culture. Thematic data analysis will be conducted to identify patterns in the contents of the data. The transcribed data will be transferred into an electronic document, in preparation for data analysis.

ABSTRACT NUMBER / ABSTRAKNOMMER: 11

Investigating the suitability of standardized Euroflow™ flow cytometry panels for the characterisation and diagnosis of chronic lymphocytic leukaemia at Tygerberg Academic Hospital, South Africa.

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Background. Flow cytometry (FC) immunophenotyping is crucial in the diagnosis and classification of haematological malignancies. To produce reliable and reproducible results requires standardisation of FC techniques. Reproducibility is important in inter-laboratory studies which are known to be effective for laboratory methodology improvement. The aim of this study is to introduce standardised multicolour FC in the diagnosis of haematological malignancies using chronic lymphocytic leukaemia (CLL) as a pilot. In addition, we aim to document the incidence of CLL from the year 2011 to 2016 in the Tygerberg Academic Hospital (TAH) catchment area of Cape Town, South Africa (SA).Methods. 20 CLL patients were recruited at TAH. Bio-specimens were prepared and analysed on the Beckman Coulter Navios flow cytometer using Euroflow™ standardised FC protocols and immunophenotypic panels with two tubes for detecting B-cell chronic lymphoproliferative disorders (B-CLPD). Tube 1 included CD20, CD4, CD45, CD8, lg-Kappa, CD56, lg-Lambda, CD5, CD19, TCRγσ, CD3 and CD38. Tube 2 included CD20, CD45, CD23, CD10, CD79b, CD19, CD200 and CD43. Combined, the two tubes identified CLL from other B-CLPD. The CLL immunophenotypic profiles were stored in a database using the compass tool of the Infinicyt™ FC software. All CLL cases at TAH from the year 2011 to 2016 were captured and analysed using descriptive statistics.Results. In comparison with the SA National Health Laboratory Service (NHLS) results, the Euroflow™ standardised multicolour FC panels and protocols are suitable for immunophenotyping CLL in this SA population. Discussion. Accurate and consistent laboratory techniques and strict standardisation in FC enhances the confidence in inter-laboratory studies. Haematological malignancy immunophenotypic disease databases allow for faster differential diagnoses of new disease cases which is needed within our setting. Furthermore, these databases permit clear identification of atypical cases. Monitoring haematological malignancy trends is a crucial step in the management of the disease.

ABSTRACT NUMBER / ABSTRAKNOMMER: 12

A descriptive study of type 1 hereditary angioedema in the Western Cape

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BACKGROUNDHereditary angioedema (HAE) is a rare autosomal dominant condition due to a deficiency of the enzyme C1 esterase inhibitor resulting in recurrent attacks of angioedema. Little is known about this condition in sub-Saharan Africa. To our knowledge, this represents the largest cohort on the African continent.METHODSWe retrospectively reviewed the data of 43 confirmed cases of HAE between 2010 and 2015 at the Allergy Diagnostic and Clinical Research Unit (ADCRU) at the UCT Lung Institute and the allergy clinic at GSH. Adults with confirmed type 1 HAE and minors (<18 years) who were diagnosed after screening family members were included in the final analysis. Ethics approval was obtained from the human research ethics committees of Stellenbosch University and UCT.RESULTSNearly two thirds were female. The median age at diagnosis was 20 years while the median duration of illness was 10.5 years. Most of the cases (63%) were of Mixed Ancestry. Fifty-one percent were index cases while the remainder were diagnosed after screening. Twelve families made up the majority of the cohort. The median duration of an attack was 48 hours. Acute attacks predominantly affected the limbs (86%). Danazol was used as long-term prophylaxis in 49% while human C1 esterase inhibitor concentrate was only used in 9% for short-term prophylaxis. Twenty-six percent of life-threatening attacks were treated with fresh frozen plasma while icatibant was only used in 9%. The overall mortality was 4.5%.CONCLUSIONType 1 HAE is a relatively uncommon condition in the Western Cape. It predominantly affects females of Mixed Ancestry. The most frequent anatomical site for an acute attack is the limbs. Life-threatening attacks are most often treated with fresh frozen plasma, while androgens are used for long-term prophylaxis due to a lack of access to more contemporary therapies. Despite this, mortality remains low.

ABSTRACT NUMBER / ABSTRAKNOMMER: 13

The role of mitochondrial ATM in cardiac oxidative phosphorylation and mitophagy in obesity

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Ataxia Telangiectasia (A-T) is a rare, recessive disease that arises due to a decrease or absence of Ataxia Telangiectasia mutated protein kinase (ATM). A-T results in insulin resistance, type 2 diabetes and cardiovascular disease, while the absence of ATM has been associated with increased oxidative stress. ATM also maintains glucose and redox homeostasis. Our laboratory has shown that myocardial ATM is downregulated in a diet-induced obesity (DIO) rat model and recently demonstrated that ATM is located on the inner mitochondrial membrane. In light of the potential importance of mitochondrial dysfunction associated with cardiovascular disease, insulin resistance and T2D in obesity, this study aimed to investigate the role of mitochondrial ATM in cardiac oxidative phosphorylation (oxphos) and mitophagy in male DIO Wistar rats. Ex vivo perfusion (n=6-9/group) of hearts from rats fed either normal rat chow (C) or a high fat diet (DIO) for 16 weeks, with insulin as an ATM activator ± the specific ATM inhibitor, KU60019, was performed prior to mitochondrial isolation and oxidative phosphorylation potential measurements(Clarke-type electrode) in either a glutamate or fatty acid substrate. Inhibition of ATM significantly decreased O2 consumption and ATP synthesis in mitochondria irrespective of diet or substrate used ($p<0.05$). Insulin perfusion alone (i) significantly increased O2 consumption and ATP synthesis ($p<0.05$) with both substrates in DIO and controls; (ii) significantly improved RCI (State3/State4, $p<0.05$) and recovery after anoxia in DIO in the glutamate substrate. However, in combination with KU60019, the absence of ATM activation decreased the effect of insulin on the latter parameters, possibly due to an increase in uncoupling. Moreover, KU60019 decreased the autophagy/mitophagy proteins, LC3-II and p62, but resulted in Parkin accumulation independently of PINK in the mitochondria. In conclusion, this study found that insulin partially mediates its effect on oxphos through ATM, and that the absence of ATM influences mitophagy.

ABSTRACT NUMBER / ABSTRAKNOMMER: 14

The efficacy of electrotherapy modalities compared to placebo electrotherapy for improving pain, physical function and quality of life in adults with Fibromyalgia Syndrome: A Systematic Review

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BACKGROUNDFibromyalgia syndrome (FMS) is the second most common rheumatological condition worldwide. It is characterised by chronic pain and associated with reduced quality of life. Limited research exists regarding the efficacy of electrotherapy (ET) versus placebo ET in the management of FMS. OBJECTIVETo update, critically appraise and collate current evidence for the efficacy of ET versus placebo ET to decrease pain and increase physical function and quality of life in adults with FMS. METHODOLOGYSeven computerised databases were searched from inception to April 2017, namely Pubmed, Cochrane Library, PEDro, Ebsco Host, Science Direct, Scopus and OTSeeker. Search terms included: Fibromyalgia Syndrome, physical therapy and/or physiotherapy and electrotherapy. Included articles had to meet specific eligibility criteria. Methodological quality was appraised using the PEDro scale. Data were extracted using the adapted JBI Data Extraction Form. Heterogeneity regarding the ET modalities and regimens between studies made statistical pooling inappropriate, thus results were described narratively. RESULTSThree randomised controlled trials were included, with an average PEDro score of 6/10. Modalities evaluated were low-level laser therapy and pulsed electromagnetic field therapy. Results indicate that ET significantly improves pain, QOL and physical function. ET was favoured over placebo ET for physical function, while conflicting results regarding the superiority of ET over placebo for pain and quality of life were reported in two of the three studies. CONCLUSIONLevel II evidence suggests that ET is beneficial in reducing pain and improving QOL and physical function in adults with FMS in the short-term, with benefits outlasting that of placebo. Evidence is conflicting on whether ET is more effective than placebo for some outcomes. Physiotherapists should offer ET as a supplementary treatment option for FMS, considering patient preferences and expectations. Further research is needed to establish the superiority of ET over placebo and to determine long-term effects.

ABSTRACT NUMBER / ABSTRAKNOMMER: 15

Adipocytic differentiation of proximal femur-derived mesenchymal stem cells is characterised by the expression of brown fat genes and is modulated by glucocorticoids in vitro

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Low bone density is associated with marrow adiposity in glucocorticoid induced osteoporosis (GIO). This loss of bone mass has been attributed to diminished osteoblast number due to aberrant skewing of osteoblast progenitor mesenchymal stem cell (MSC) differentiation towards adipogenesis. Within the proximal femur (pf), a region susceptible to fracture during osteoporosis, there resides MSCs which readily undergo adipogenesis and aberrant differentiation of these cells might contribute to GIO. We therefore wished to characterise the effects of glucocorticoids (GCs) on adipogenic gene

expression in pfMSCsRat pfMSCs were treated with either control media with or without the addition of the GC dexamethasone, or with adipogenic differentiation media (AM). RNA was isolated after 7 days and 84 adipogenesis-associated genes were measured using an adipogenesis array. In addition to the up-regulation of white fat genes encoding transcription factors (Cebpa, Klf15, Pparg and Srebf1), adipokines (Adipoq, Agt, Cfd, Retn) and proteins involved in lipid metabolism/energy utilization (Acacb, Fasn, Lipe, Lpl, Slc2a4, Insr and Fabp4) following AM treatment, several brown fat genes (Ucp1, Dio2, Adrb2, Ppargc1b and Ppara) were also up-regulated. Ucp1 expression, normalized to Fabp4, was 6 fold higher in fully differentiated pfMSCs compared to fully differentiated bone marrow MSCs. Although the addition of dexamethasone to pfMSCs cultured in control media did not result in lipid accumulation, adipogenesis-associated genes, including Fabp4, Slc2a4, Cfd, Tsc22d3, Angpt2, Ppara, Ppargc1a, Klf15and Cebpd were significantly upregulated. As pfMSC-derived adipocytes express markers of both mature adipocytes and brown adipocytes, pfMSCs may play a role in thermogenesis and energy utilisation, as well as lipid storage within bone. Although glucocorticoid administration was insufficient to initiate adipogenesis in vitro, treatment caused an increase in pro-adipogenic transcription factors which may increase the sensitivity of the cells towards subsequent adipogenic signals, thereby augmenting adipogenesis.

ABSTRACT NUMBER / ABSTRAKNOMMER: 16

The prevalence and predictive factors for sustained diabetes after the diagnosis of gestational diabetes in tertiary referral center at 6-12 weeks postpartum.

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Background The accelerating prevalence of Type 2 diabetes mellitus (DM) is a major public health concern. Gestational diabetes(GDM) is an established risk factor for future DM. Pregnancy is often the first exposure to healthcare and may lead to the identification of glucose abnormalities present before pregnancy. Hyperglycemia of first onset in pregnancy subside postpartum whereas it is sustained in the previously undiagnosed diabetic classified as GDM. The identification of factors for sustained and/or recurrent DM after GDM will assist in improved risk stratification during pregnancy and may lead to better surveillance strategies of this high risk group.Aims 1) To determine the prevalence of sustained hyperglycemia in our GDM cohort at 6-12 weeks postpartum. 2) To identify parameters that may predict DM after pregnancy.Methods The study was conducted prospectively at the postpartum diabetic clinic at Tygerberg Hospital over a period of 12 months. Consecutive patients diagnosed with diabetes in pregnancy were evaluated by means of a standard OGTT (Oral glucose tolerance test) and HBA1C 6-12 weeks postpartum. Patients with pre-gestational DM were excluded. Results Almost half (46%) were found to be hyperglycemic at follow with DM diagnosed in 27% and prediabetes in 19%. More than a third (37%) had either a fasting or postprandial value indicative of overt DM already in pregnancy. Of these half were diagnosed with DM postpartum. Gestation < 24 weeks at diagnosis, degree of dysglycemia at diagnosis (FPG, HBA1C and insulin use), HBA1C at delivery, age > 36 years, family history of DM as well as preterm labor were associated with DM at follow up. The family history of DM, HBA1C and age remained the strongest predictors of DM after multivariate analysis.

ABSTRACT NUMBER / ABSTRAKNOMMER: 17

The effects of obesogenic feeding and a green Rooibos extract on in vivo adiposity and ex vivo function of cultured adipose-derived stromal cells

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Background: Adipose-derived stem cells (ADSCs) can be differentiated into mature adipocytes in culture and used to study adipocyte biology ex vivo. We investigated the effects of obesogenic feeding on in vivo visceral adiposity and on the ex vivo differentiation of ADSCs from subcutaneous

and visceral fat (scADSCs and pvADSCs, respectively), and whether these effects could be counteracted by the patented green Rooibos extract (GRT) from Afriplex. Methods: Male Wistar rats were placed on the following diets for 16 weeks: control; high fat diet (HFD); and high fat/high fructose/cholesterol diet (HF-FCD). Within each diet group, a subgroup of animals received Afriplex GRT (60mg/kg body weight) from weeks 10 to 16. The animals were subsequently sacrificed and inguinal subcutaneous (SC) and perirenal visceral (PV) adipose tissue biopsies were harvested. Total body weight (BW) and PV fat pad weight were recorded. ADSCs were isolated from adipose tissue and differentiated into mature adipocytes through treatment with adipocytic induction media for 12 days. Intracellular lipid droplets were stained with Oil Red O (ORO) and quantified with image analysis software. Results: The in vivo visceral adiposity index (PV weight / total body weight) increased with HFD and HF-FCD and was normalised with HFD-GRT. The ex vivo visceral adiposity index (% ORO staining in pvADSCs / % ORO staining in scADSCs from the same animal) was increased with HFD and HF-FCD and unexpectedly also in all GRT groups. AM-induced lipid accumulation was suppressed in scADSCs from HFD, HF-FCD and all GRT groups. Conclusions: Obesogenic feeding permanently re-programmed the adipogenic response of ADSCs towards increased visceral adiposity. GRT did not normalise lipid accumulation in scADSCs from HFD or HF-FCD animals, but rather suppressed lipid accumulation in scADSCs independent of diet. Consequently, the dietary use of Afriplex GRT may be associated with abnormal adipose tissue function.

ABSTRACT NUMBER / ABSTRAKNOMMER: 18

The development and pilot testing of health endorsement logos for food products that are healthy choices based on the South African nutrient profile model

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Single, credible front-of package nutrition labelling systems can help consumers make healthier food choices and address the current non-communicable disease (NCD) burden. With the publication of the Regulations relating to the labelling and advertising of foods: Amendment (No R.429) a need was identified for the development of a health endorsement logo (HEL) for healthy food products. This study aimed to develop a set of HELs and to pilot test these concept logos on the City of Cape Town (CoCT) consumer. In this mixed method study, nine focus-group discussions (FGDs) were conducted using adult consumers recruited at 16 randomly selected grocery stores (CoCT) to explore what type of HELs are preferred and why. Content analysis of data was performed and 10 HELs were designed by a graphic design team accordingly. A modified Delphi technique, conducted with experts in the fields of nutrition/food science was employed to eliminate the lowest scoring HELs and to improve the design of remaining logos. Participants from the initial FGDs took part in the pilot testing of the improved logos. Participants from FGDs (n=67) were positive about a single HEL, stating it would make food labelling less confusing as they didn't understand the various HELs used. Participants indicated the logo should include wording related to 'healthy choice' or 'better choice' and pictures/symbols related directly to health and/or food. During two rounds of scoring and comments by an expert panel (n=19), 5 logos were eliminated and the design of the remaining 5 improved. Three of 5 remaining logos received overall scores of > 60% during FGDs (n=36) in the pilot-testing phase.HELs were designed and consumer tested. Three designs will be submitted to the national Department of Health for further testing before implementation as a tool to assist in addressing the high incidence of NCDs in South Africa.

ABSTRACT NUMBER / ABSTRAKNOMMER: 19

Impact of prolonged occlusion flow mediated dilatation on radial artery cannulation in patients undergoing transradial coronary angiography

Jacques Doubell, Charles Kyriakakis, Amaan Panday, Hellmuth Weich, Philip Herbst, Alfonso Pecoraro, Bradley Griffiths, HW Snyman, Lorrita Kabwe, Henry Cyster, Jane Moses, Anton Doubell, Division of Cardiology, Department of Medicine.

Background: The transradial approach to coronary angiography has become the technique of choice but is not without complications. Transradial cannulation has higher failure rates and can be complicated by radial artery spasm(RAS), radial artery pulsation loss(RAPL) and radial artery occlusion(RAO). We aim to explore the use of prolonged occlusion flow mediated dilatation(PO-FMD) to dilate the vessel prior to cannulation to increase cannulation success. We report on the first 80 patients enrolled.Methods:Patients undergoing transradial coronary angiography are enrolled and randomized into PO-FMD and Sham-PO-FMD groups. PO-FMD is achieved by a 10 minute inflation of a blood pressure cuff on the upper arm prior to cannulation. Number of attempts , success of cannulation and occurrence of complications are recorded. The radial artery is assessed by ultrasonography before and after the procedure. Results:45 Patients were randomized to the sham-PO-FMD group and 35 to the PO-FMD group. The radial artery diameter prior to cannulation was 2.26mm±0.49mm in the sham-PO-FMD group and 2.35mm±0.42mm in the PO-FMD group. The number of puncure attempts was 2.26±1.90 in the sham-PO-FMD group and 1.71±1.29 in the PO-FMD group. There were 3 failed cannulations in the sham-PO-FMD group and 0 in the PO-FMD group. The time to cannulation was 98.95s±125.72s in the sham-PO-FMD group and 55.21s±40.68s in the PO-FMD group. There was 1 RAPL in the sham-PO-FMD group and 0 in the FMD group. No RAS or RAO was reported.Conclusion:PO-FMD appears to shorten cannulation time and decrease puncture attempts during coronary angiography. More data is needed to confirm this.

POSTER PRESENTATIONS / PLAKKAATAANBIEDINGS

ABSTRACT NUMBER / ABSTRAKNOMMER: 20

A Parkinsonian Mimic

Dr Kireshnee Naidu; Professor J Carr (Stellenbosch University - Division of Neurology, Department of Medicine)

Background: Huntington disease-like 2 (HDL2) is a neurodegenerative disorder caused by a trinucleotide expansion in the junctophilin-3 gene, that has thus far been exclusively described in patients of African ancestry. The classical clinical presentation is considered to be similar to that of Huntington's disease, with cognitive decline and chorea being the predominant features. Case report: We describe a patient of South African mixed ancestry (coloured) with a confirmed genetic result positive for HDL2 and clinical features of striking resemblance to Parkinson's disease. The patient was a 51-year old man with a background history of a mood disorder diagnosed seven years prior, who presented with a three-month history of rapidly progressive parkinsonism. On examination he was found to be profoundly bradykinetic, rigid and had a bilateral resting tremor. There was no chorea present. A significant improvement with dopamine therapy was noted. Investigations: His brain magnetic resonance scan revealed generalised cerebral and cerebellar atrophy. An F-DOPA scan was performed which displayed markedly reduced uptake within the caudate nuclei and putamen bilaterally.Conclusion: Our case highlights the wider spectrum of underlying aetiology in patients presenting with features resembling Parkinson's disease, as well as the varied clinical presentation of HDL2

ABSTRACT NUMBER / ABSTRAKNOMMER: 21

Length of hospital stay after colorectal surgery at Tygerberg Hospital: A retrospective observational study

Renilda Pillay (Registrar - Anaesthesiology and Critical care)

The efficacy of enhanced recovery after surgery (ERAS) to reduce length of hospital stay (LOS), is well documented in developed countries, however its efficacy in developing countries such as South Africa, has never been investigated before and is unclear. This was a retrospective study to assess the current length of hospital stay of colorectal surgery patients at Tygerberg Hospital during the period of January 2013 to December 2015. The primary objective was to determine and further analyse the LOS. This included total hospital, preoperative, postoperative and unit stay. The secondary objective was to analyse the population, the surgical profile, as well as mortality and morbidity. A retrospective study of the length of hospital stay amongst colorectal surgery patients at Tygerberg Hospital was done during January 2013 to December 2015. Patients were identified by the National Health Laboratory database and the Tygerberg surgery department database of patients who received colorectal surgery during January 2013 to December 2015. A total of 487 entries were collected, of which 189 (43%) were females and 248 (57%) male. The median total length of stay was 14 days with a range of 1 to 67 days [95% CI 9-17]. The incidence of emergency surgery was 43%, and that of elective surgery 57%. Approximately 36% of procedures were done laparoscopically. There was a mortality rate of 1% for primary elective surgery, whereas secondary emergency surgery had a mortality rate of 23%. The anastomotic leakage rate for primary elective surgery was 2%. The length of hospital stay after colorectal surgery at Tygerberg Hopsital was longer when compared to developed countries. Developing countries like South Africa with limited recourses would benefit from the ERAS protocol to reduce the length of hospital stay. Secondary emergency surgery has a relatively higher mortality rate and would benefit from special care.

ABSTRACT NUMBER / ABSTRAKNOMMER: 22

Pan-cancer analysis: a pilot investigation to identify shared mutations in urological cancer

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Aim: Different cancers are generally associated with mutations in different genes, although recent data derived from The Cancer Genome Atlas (TCGA) has shown that the same gene mutation could be linked to several different types of cancer. We have previously developed genetic assays to screen the entire coding region, comprising 2 exons, of the homeobox B13 (HOXB13) gene, as well as a tag single nucleotide polymorphism (tag SNP) upstream of the gene (B Edwards, Stellenbosch University 2014). Our investigation and the study by Chen et al. (2013) has shown that the HOXB13 G48E (rs138213197) mutation, which has been suggested to be a strong prognostic biomarker, is absent in South African men with prostate cancer, whereas the tag SNP rs117576373 was significantly associated with increased risk of prostate cancer in South African White men. Beebe-Dimmer et al. (2015) recently showed that the HOXB13 G48E mutation is observed at a significantly higher frequency in men with bladder cancer. Examining the similarities and differences among the genomic alterations across diverse cancer types could provide further insights into cancer pathobiology, diagnoses and clinical management. Consequently, the present study aims to determine the frequency of HOXB13-associated mutations in South African bladder cancer patients.Methods: We used a developed automated sequencing and restriction fragment length polymorphism (RFLP) assays to screen DNA extracted from tumour tissue from a panel of 32 South African patients.Results: In our small study none of the screened individuals harboured the TT genotype, we essentially used the sequencing to confirm that individuals with the CC or CT genotype do not have the G84E mutation, no individuals in our study carried the TT genotypeConclusion: The present study confirmed the absence of HOXB13-associated mutations, rs138213197 and rs117576373, in a small subgroup of South African high grade bladder cancer patients

ABSTRACT NUMBER / ABSTRAKNOMMER: 23

Osteopetrosis: a tough case to crack

Jocelyn Hellig (Division of endocrinology - Department of medicine), Magda Conradie (Division of endocrinology - Department of medicine)

Background: Low bone mineral density (BMD) is an almost invariable finding in patients with increased fracture risk and skeletal fragility; however, one may infrequently encounter a high bone mineral density in this setting. The heterogenous group of osteopetroses are characterized generally by skeletal fragility despite an abnormally high BMD. The shared genetic defect, in most cases, has been ascribed to a mutation in the chloride channel 7 gene (CLCN7). Methods: In this, we describe two cases of osteopetroses recently encountered in our department. Results: The first case is a 36 year-old woman whose clinical course has been characterized by multiple fractures in childhood and severe bone marrow infiltration with a pancytopenia. We encountered her for the first time in adulthood following her most recent low-trauma, long-bone fractures. Radiographs demonstrated marked osteosclerosis with sandwich vertebrae, a thickened skull base, ribs and pelvic bones. DXA measured BMD exceeded +5 SD compared to age and gender matched controls (Z-score). Genetic testing identified a pathogenic variant in CLCN7, establishing the diagnosis; probably a variant of the ADO II osteopetrosis (or Albers Schonberg disease). This was done at Michael Whyte's laboratory in Pennsylvania. Her current treatment is symptomatic only. The second case centers around a 47-year old woman with non-specific backache, no fracture history and an incidental finding of typical sandwich-shaped vertebra and a very high DXA measured BMD. A full radiological assessment revealed, in addition to the sandwich vertebra, osteosclerosis of the skull base and rib cage. These radiological findings in an asymptomatic patient are very suggestive of Albers Schonberg disease. Her full blood count and biochemistry was normal. The outcomes of her genetic testing is still pending. Conclusion: We have described two cases of a relatively rare metabolic bone disease, with two different expressions of a shared underlying pathology.

ABSTRACT NUMBER / ABSTRAKNOMMER: 24

Project management – a compass for multi-centred studies in Africa

Hayley Irusen (Urology), Pedro Fernandez (Stellenbosch University - Urology)

Project management has been the mainstay for engineers, but is being used with increasing regularity by medical teams to guide clinical trials and research projects. We recently initiated the Men of African Descent and Carcinoma of the Prostate (MADCaP), a large NIH-funded multi-centered genetic epidemiological study involving 7 recruitment centers across Africa (South Africa [SU and WITS], Ghana [37MH and KBTH], Nigeria [UCH and UATH], Senegal [IRFU]) and 4 partners based in the USA, each centre with its own project manager (PM),each interacting with the PM at the Dana Faber Cancer Institute (DFCI) (USA). Multi-centre project management strategies developed for high income countries generally tend to be ineffectual when implemented in low-to-middle-income countries as some of the challenges faced are unique to an African environment e.g. i) administrative red tape (institutional approvals may take 6-12 weeks), ii) working across time zones, iii) inter-and intra-country differences in medical practices (non-uniform), iv)recruitment logistics, v) inter-and intra-country population differences (social, cultural), and vi) data missingness and availability.Following the Pilot Study the consortium developed the "MADCAP_PM toolkit" to enhance project management and address challenges particular to multi-institutional research in Africa. The toolkit was designed after crucial input from consortium members, following interaction with nurses, clinicians, and administrative staff at study sites during the pilot phase. The increasing availability of technologies within Africa, such as smartphone applications (e.g. Whats App), face-to-face conference calling and electronic medical records, further facilitates the toolkit's usability. Each centers' operational activities are guided by the toolkit, thereby standardizing operations between centers based on resources and institutional capacity. Lastly, the toolkit is generic in nature allowing it to be adapted to suit the requirements of other researchers undertaking research in Africa. "If you want to go fast, go alone, if you want to go far, go together" – African proverb

ABSTRACT NUMBER / ABSTRAKNOMMER: 25

Histological and immunohistochemical evaluation of Sentinel lymph nodes in breast cancer at a tertiary hospital in the Western Cape, South Africa.

Adri van Zyl (US and NHLS - Anat Path)

Background. Breast carcinoma remains the most prevalent cancer of woman, with over 300 000 deaths annually worldwide. Axillary lymph node status is essential for the clinical staging of breast carcinoma.Objective. To determine effective histological examination of sentinel lymph node (SLN) sections for the detection of metastatic breast carcinoma.Methods. A prospective hospital-based study was done. Three sets of 15 consecutive serial sections were prepared from each case at one sitting, each measuring 3-5µm in thickness and mounted on separate slides. . The first 4 sections were stained with hematoxylin and eosin (H&E). The 5th section was stained for pancytokeratins, using MNF116.Results. Twenty patients who met the inclusion criteria of this study underwent SLN biopsies and simple mastectomies or tumour excisions. Twelve sentinel lymph nodes of eleven patients contained metastatic carcinoma, all detected at level I. The size of metastatic carcinoma ranged between 0,08 x 0,08mm (micro metastases) and 25 x 15mm. Nine cases showed macro metastases, varying in size between 2 x 3,5mm and 25 x 15mm. . Nine patients (19 nodes in total, mean 2.1, range 1-5) did not have demonstrable metastatic disease in the 45 sections of levels I-IX, including MNF116 on every fifth section. Conclusion. This study supports a conservative and cost effective approach that comprises embedding of the entire sentinel lymph node and the histopathological examination of 4 H&E stained sections, which will usually demonstrate metastatic carcinoma. In the event of absence of metastatic carcinoma, immunohistochemical staining for pancytokeratin will detect tumour cells in a small percentage of cases. Examination of additional H&E or pancytokeratin stained sections is not cost effective.

ABSTRACT NUMBER / ABSTRAKNOMMER: 26

The racial variations of height in the Carotid Bifurcation.

Rita Liezl Dreyer (Anatomy - Division of Anatomy and Histology Department of Biomedical Sciences Faculty of Medicine & Health Sciences Stellenbosch U)

The carotid sinus (CS) is a localised dilatation of the internal carotid artery at the bifurcation of the common carotid. The CS is of unique importance for numerus medical fields but the precise height of the carotid bifurcation (CB) and various other aspects are unknown. The height of the CB determines selection between carotid endarterectomy and carotid stenting for carotid atheromatous disease. Racial variations of height of carotid bifurcation (HCB) have been seen in an Ethiopian study show casing a higher HCB in the black population. The aim of this pilot study is to determine the racial variation of the HCB in the Stellenbosch Cadaver cohort (N=58). Black (n=22), Coloured (n=28) and White (n=8) cadavers were dissected to expose the carotid bifurcation. Measurements were taken between the Carotid bifurcation and the angle of the mandible with a calliper. The coloured population had the highest HCB, whereas the white population had the lowest HCB. The trend seen in the black population correlates with the Ethiopian study. The black population has a higher HCB than the white but lower than the coloured. The HCB in all racial groups was higher on the right side. A higher HCB complicates medical procedures due to the close proximity to bony elements.The general knowledge of where the HCB is decreases risk. The precise whereabouts of the HCB are important for many medical practices. In conclusion, there are racial variations of HCB in the Stellenbosch cadaver cohort.

ABSTRACT NUMBER / ABSTRAKNOMMER: 27

An investigation into the anti-hypersentive effects of a green rooibos extract.

Mignon van Vuuren (Stellenbosch University - Medical Physiology)

The metabolic syndrome, a cluster of risk factors associated with development of obesity, diabetes and dyslipidaemia, are believed to be present in up to one third of individuals suffering from hypertension. Hypertension is characterized by constant elevation of either resting systolic blood pressure (≥ 140 mmHg), diastolic blood pressure (≥ 90 mmHg), or both. During hypertension, pressure in the blood vessels increase, the heart's pumping force is elevated, resulting in cardiovascular complications including: stroke, ischaemic heart disease and atherosclerosis. Green rooibos ("unfermented" rooibos"), is immediately dried after harvesting and contain 10 times more aspalathin than "fermented" rooibos. Green rooibos extract (Afriplex GRT) is a spray-dried powder from green rooibos. Previous studies demonstrated that "fermented" rooibos can alleviate hypertension, however to date, no studies have been done on aspalathin-rich Afriplex GRT, to determine its possible anti-hypertensive effects. We used one of our well-characterized rat models of obesity, a model known to also develop hypertension, to: (i) Study the effects of GRT in the development of the cardiovascular pathology associated with the metabolic syndrome and insulin resistance. (ii) Determine blood pressure increase over time in animals on a high fat diet (HFD) and to investigate the effects and mechanisms of GRT on blood pressure and vascular contractility. HFD increased: bodyweight gain ($p<0.05$), IP-fat accumulation ($p<0.001$); leptin levels ($p<0.05$); and insulin resistance ($p<0.05$); whereas treatment with GRT attenuated weight gain ($p<0.05$) and increased insulin sensitivity ($p<0.05$). HFD induced hypertension ($p<0.001$) and treatment with GRT decreased systolic ($p=0.0277$) and diastolic ($p=0.0434$) blood pressures. Furthermore, HFD GRT treated animals showed increased aortic relaxation ($p<0.0001$), total-PKB expression ($p<0.01$) and phosphorylation ($p<0.05$), indicating possible improved eNOS activity and nitric oxide production.We conclude that Afriplex GRT in this rat model was anti-obesogenic, alleviated insulin resistance, was anti-hypertensive and resulted in improved aortic relaxation in the vascular bed.

ABSTRACT NUMBER / ABSTRAKNOMMER: 28

Beta secretase regulation and inflammation in pancreatic beta cells: the potential role of Rooibos

Joleen Burger (Stellenbosch Univeristy - Medical Physiology), Christo J.F. Muller (South African Medical Research Council - Biomedical Research and Innovation Platform), Nireshni Chellan (South African Medical Research Council - Biomedical Research and Innovation Platform), John Lopes (Stellenbosch Univeristy - Medical Physiology)

Inflammation plays an important role in pancreatic β-cell impairment and, in conjunction with insulin resistance, consequently leads to the progression of type 2 diabetes. Cleaving of the β-site amyloid precursor protein (APP) by cleavage enzyme (BACE) in β-cells modulates the deposition of cytotoxic islet amyloid and subsequently induces oxidative stress, making BACE inhibition a therapeutic target. Aspalathin and phenylpyruvic acid glucoside (PPAG), both bioactive polyphenols of an aspalathin-enriched, unfermented Rooibos extract (GRT), have been reported to be strong anti-oxidants. In the pancreas, anti-oxidants may also reduce inflammation induced by deposition of cytotoxic islet amyloid. The aim of this component of the study was to determine if GRT or two of its most bioactive polyphenols (i.e. aspalathin and PPAG) have protective effects on inflamed pancreatic β-cells, as well as BACE inhibitory potential.BACE inhibitor profiling of GRT, aspalathin, and PPAG was assessed by using a fluorescence resonance energy transfer (FRET) non-cell based assay. In INS1 β-cells, a cytokine cocktail, containing TNF-α, IL-1β and IFN-γ, was used to induce moderate inflammation. Beta cell viability and oxidative stress were measured by quantifying cellular ATP and the DCF assay. Higher concentrations of aspalathin and moreso, GRT, showed a trend towards BACE inhibition. However, it is seen that that the same concentrations of aspalathin and GRT reduces the viability (i.e. cellular ATP) of INS-1 cells in the presence and, to a lesser extent, in the absence of the cytokine cocktail. However, lower concentrations of aspalathin, GRT and PPAG may have a protective effect on inflamed pancreatic β-cells as a slight increase in overall cell viability and decrease in oxidative stress was observed. Therefore, further investigation into pancreatic inflammation and BACE activity is necessary in order to fully elucidate the potential beneficial effects of Rooibos.

ABSTRACT NUMBER / ABSTRAKNOMMER: 29

Impact of bone-marrow derived mesenchymal stem cell conditioned media on the migration of C2C12 myoblasts: Influence of obesity.

Mari van de Vyver (Stellenbosch University - Medicine), Kerry Lanz (Stellenbosch University - Physiological sciences), Kathryn Helen Myburgh (Stellenbosch University - Physiological sciences)

The growth promoting and regenerative capacity of bone marrow derived mesenchymal stem cells (BM-MSCs) is known to be mediated through paracrine functions and there are growing evidence to support the notion that BM-MSCs can promote skeletal muscle regeneration. The trophic abilities of endogenous BM-MSCs can however be altered in chronic inflammatory conditions. We therefore hypothesize that the pathogenesis of obesity-associated diabetes alters the secretome of BM-MSCs and that an altered cytokine secretion profile affects the ability of BM-MSCs to promote myoblast migration. Conditioned media (CM) was collected from primary BM-MSCs isolated from either healthy lean control (C57BL/6J) (CMcontrol) or obese pre-diabetic mice (B6.Cg-Lepob/J) (CMob/ob) and analysed for IL-1β, IL-2, IL-4, IL-5, IL-6, IL-10, GM-CSF, IFNγ and TNFα concentrations. IL-6 (CMcontrol 369 ± 182 pg/mL; CMob/ob 48 ± 8 pg/mL) and TNFα (CMcontrol 8.8 ± 0.6 pg/mL; CMob/ob 5.5 ± 1.1 pg/mL) concentrations differed significantly ($p<0.05$) between groups. CM was then used to treat C2C12 myoblasts and C3H/10T1/2 MSCs after infliction of an in vitro scratch injury and the rate of wound closure assessed. We demonstrate for the first time that the beneficial trophic effect of BM-MSCs on myoblast migration is compromised under obese pre-diabetic conditions. Our data furthermore indicate that BM-MSCs derived from obese pre-diabetic mice improved the migration of C3H/10T1/2 MSCs, suggesting a compensatory mechanism whereby dysfunctional BM-MSCs recruit additional MSCs. This study highlights the need for a better mechanistic understanding of BM-MSC trophic functions during muscle regeneration and the implications of pathological alteration in the microenvironment.

ABSTRACT NUMBER / ABSTRAKNOMMER: 30

Effect of myocardial ischaemia/reperfusion injury on mitophagic flux and mitochondrial oxidative phosphorylation in obese rats treated with chloroquine.

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Background and aim: Mitophagy flux is a dynamic cellular process, from the formation of autophagosome, autophagosome–lysosome fusion to final degradation of mitochondria. Mitophagy is upregulated in myocardial ischaemia and reperfusion, possibly exerting both beneficial and detrimental effects. Evaluation of its significance in cardiac pathophysiology is complicated by difficulties in determining mitophagic activity based on snapshot measurements, rather than evaluation of flux. The aims of this study were to evaluate mitophagic flux in (i) myocardial ischaemia/reperfusion, using chloroquine, an inhibitor of lysosomal activity, compared to snapshot measurements (ii) obesity.Methods: Four groups of rats were studied: control rats ± chloroquine (10mg/kg) and high fat diet (HFD) rats ± chloroquine. After 16 weeks on the diet, perfused hearts were subjected to 25min global ischaemia/10min reperfusion. Mitochondria were isolated after stabilization, ischaemia and reperfusion and oxidative phosphorylation measured polarographically. The mitophagy markers (PINK, Parkin, P62/SQSTM1 and TOM70) were detected by Immunoblot analysis. Results: After ischaemia/reperfusion, chloroquine significantly decreased mitochondrial oxidative phosphorylation rate (states 3 and 4) in both groups; with glutamate, but not palmitoyl-carnitine, it significantly reduced control mitochondrial RCI. HFD mitochondria have decreased RCI levels with both substrates, which were further reduced by chloroquine. Chloroquine caused an improvement in QO2 (state 3) of HFD mitochondria during reoxygenation after anoxia. It increased TOM70 and P62 expression during reperfusion in both groups, while reducing Parkin and PINK. TOM70 and P62 levels did not differ between control and HFD groups throughout the perfusion protocol while Parkin (ischaemia and reperfusion) and PINK (stabilization) levels were higher in HFD mitochondria. Discussion: Chloroquine affects mitophagy, particularly during reperfusion and

illustrates the significance of flux rather than snapshot measurements. No differences between TOM70 and p62 of control and HFD mitochondria were observed, but Parkin expression was higher in HFD mitochondria, suggesting that obesity affects mitophagy during ischaemia/reperfusion.

ABSTRACT NUMBER / ABSTRAKNOMMER: 31

Co-occurrence of breast cancer and multiple sclerosis underpinned by genetic variation in the iron metabolism pathway

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BACKGROUNDA Caucasian woman was diagnosed with multiple sclerosis (MS) and invasive ductal carcinoma at age 38 years and 43 years, respectively. No family history of cancer or MS was reported in this patient with triple negative breast carcinoma, as determined by immunohistochemistry tests. In this study, whole exome sequencing (WES) was performed to screen for causative mutations and shared disease pathways in the index case, followed by genotype-phenotype association studies in an extended study population.METHODSWES was performed in the index case after obtaining informed consent for comprehensive genomic testing. After exclusion of a high-penetrance BRCA1/2 mutation, we searched for genetic variation in the iron metabolism and inflammation pathways. This was based on iron deficiency and high C-reactive protein levels detected during the WES pre-screen step. Extended genotyping was performed in 104 MS patients using real-time polymerase chain reaction (PCR), evaluated in relation to MS disability status.RESULTS Genetic variation was detected in both the haemochromatosis (HFE) and matriptase-2 (TMPRSS6) genes with opposing effects on serum iron status. Homozygosity for the iron-lowering TMPRSS6 missense mutation, A736V (rs85571), was compatible with detection of low serum iron (10.8 µmol/L) and transferrin saturation (15%) levels. High serum ferritin (359 ng/mL) levels in the presence of raised C-reactive protein (10.5 mg/L) is associated with inflammation, as supported by detection of the pro-inflammatory TNF-alpha -308C>A functional polymorphism. The iron-loading HFE H63D mutation had a protective effect against MS disability, as reflected by the expanded disability status score (EDSS) [GC/GG (2.5; 95% CI 1.4- 3.6) vs CC (4.1; 95% CI 3.4- 4.9),p=0.04]. CONCLUSIONSOur results support previous findings of reduced TMPRSS6 gene expression in sporadic triple-negative breast cancer. Further studies are warranted to elucidate the potential clinical significance of shared disease pathways in MS patients with an increased requirements for iron in the diet.

ABSTRACT NUMBER / ABSTRAKNOMMER: 32

Investigation of the Oral Microbiome of Individuals with Metabolic Syndrome

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Background: Metabolic syndrome (MetS) is a worldwide epidemic. Risk factors for MetS are diet, lifestyle, and genetics, however, evidence suggests that disruption of the oral microbiome is an important emerging risk factor for MetS. Additionally, periodontal disease is more prevalent in individuals with metabolic syndrome and both conditions are associated with inflammation and insulin resistance. Porphyromonas gingivalis has been linked to periodontal disease and may be a marker for MetS.Aims: To compare the microbial diversity of subgingival plaque of individuals with MetS and periodontal disease to that of healthy individuals, and to determine the abundance of P. gingivalis in the oral cavity of individuals with and without periodontal disease.Methods: Subgingival plaque samples were obtained from 119 individuals from the mixed ancestral community in Bellville South, Western Cape. Individuals were classified as having MetS and/or periodontal disease using

standardised criteria. P. gingivalis DNA in dental plaque was quantified by qPCR. Next generation sequencing of the V3-V4 hypervariable region of the 16S rRNA gene was performed and sequences clustered into operational taxonomic units based on 97% similarity, using the Human Oral Microbiome Database. Microbial community profiles of healthy and diseased groups were compared using alpha and beta diversity measures.Results: The majority of OTUs (226) belonged to the phyla Firmicutes followed by Fusobacterium and Proteobacteria. The most abundant genera in both groups were Veillonella, Prevotella, Leptotrichia, Selenomonas and Fusobacterium. There were no significant differences in microbial community composition or diversity between individuals with and without MetS. There was a significant association between P. gingivalis and periodontal disease (89% vs 59% in healthy individuals).Conclusions: These findings suggest that factors other than genera-level oral microbial community composition may be responsible for the progression of MetS. P. gingivalis is associated with periodontitis in this study population.

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Theme 5 / Tema 5

Mental Health and Neurosciences/ Geestesgesondheid en Neurowetenskappe

ABSTRACTS/ABSTRAKTE

ORAL PRESENTATIONS / REFERATE

ABSTRACT NUMBER / ABSTRAKNOMMER: 1

CHARACTERIZING THE GUT MICROBIOME IN POSTTRAUMATIC STRESS DISORDER

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Violence and trauma are highly prevalent in South Africa and subsequently our population is at an increased risk of developing trauma-related disorders. Inadequate immunoregulation and elevated inflammation may be risk factors for posttraumatic stress disorder (PTSD), and microbial inputs are important determinants of immunoregulation; however, the role of the gut microbiota in vulnerability to development of PTSD is unknown. This study investigated the gut microbiome in a South African sample of PTSD-affected individuals and trauma-exposed (TE) controls from a South African mixed ancestry population, to identify potential differences in microbial diversity or microbial community structure. PTSD was diagnosed using the Clinician Administered Posttraumatic Stress Disorder Scale for DSM-5 (CAPS-5) according to DSM-5 criteria. Microbial DNA was extracted from stool samples obtained from 18 individuals with PTSD and 12 TE control. Bacterial 16S ribosomal RNA (rRNA) V3/V4 amplicons were generated and sequenced. Microbial community structure, alpha-diversity, and beta-diversity were analyzed; random forest analysis was used to identify associations between bacterial taxa and PTSD.There were no differences between PTSD and TE control groups in alpha- or beta-diversity measures, however random forests analysis revealed three phyla that can distinguish PTSD status: Actinobacteria, Lentisphaerae, and Verrucomicrobia. Decreased total abundance of these taxa was associated with higher PTSD CAPS scores. This exploratory study found that measures of microbial diversity were similar among individuals with PTSD and TE controls; however, decreased total abundance of Actinobacteria, Lentisphaerae, and Verrucomicrobia was associated with PTSD status.

ABSTRACT NUMBER / ABSTRAKNOMMER: 2

APPLICATION OF WHOLE EXOME SEQUENCING TO DISSERT PARKINSON'S DISEASE

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Parkinson's disease (PD) is a common and incurable neurodegenerative disorder. Over the last 20 years, numerous studies have confirmed that genetic factors contribute to the complex aetiology of this disorder. Recently, innovative next-generation approaches such as whole exome sequencing (WES) have been successfully employed to identify several novel PD-associated genes, including VPS35, DNAJC6 and CDCDH2. The present study aimed to identify potentially novel disease-causing mutations in three South African pedigrees with familial PD using WES and bioinformatics approaches. Cases selected for WES included two affected cousin pairs from multi-affected families, as well as two affected siblings and their affected mother in a pedigree with strong family history of PD. After excluding known mutations in PD-associated genes, DNA samples were subjected to WES using the

Ion Proton System. A custom bioinformatics pipeline was used to identify rare coding variants shared among affected cases in each of the three pedigrees assuming autosomal dominant inheritance modes. This resulted in the identification of respectively 33, 74 and 33 variants shared in each of the three pedigrees, with reported minor allele frequencies less than 0.01. Of the 140 coding variants, 56 (40%) are novel. Potentially pathogenic variants were prioritised for further analysis using a suite of in-silico functional prediction tools, including SIFT, PolyPhen2, MutationTaster, FATHMM, MetaSVM and CADD, which highlighted ten, eleven and nine variants in the respective pedigrees. Current efforts are directed towards verifying prioritised variants by means of Sanger sequencing. Additional family members will be screened for the presence of verified variants to determine co-segregation with disease. Our data support the involvement of several promising candidate genes in South African PD pedigrees. Confirmation of one or more of these variants will contribute to our understanding of the pathophysiology of this debilitating neurodegenerative disorder.

ABSTRACT NUMBER / ABSTRAKNOMMER: 3

CLINICAL OUTCOMES OF HIGH-DOSE MOCLOBEMIDE PHARMACOTHERAPY IN SOCIAL ANXIETY DISORDER

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Background: Social anxiety disorder (SAD) is a condition characterized by an excessive fear of social interactions and negative evaluation by others. SAD results in significant impairment, reduced quality of life and increased comorbidity with depression and alcohol/substance use or dependence. Moclobemide, a reversible inhibitor of monoamine oxidase A (RIMA), is an approved treatment for SAD, however the evidence for its efficacy is mixed. The aim of this study was to provide an update on the clinical efficacy of moclobemide therapy in SAD when used at the recommended dose of 600mg. Methods: A repeated measures design was utilized to investigate changes in SAD severity with moclobemide therapy, at 600mg orally per day, over 8-9 weeks. Outcomes were assessed using established clinical scales (i.e. State-Trait Anxiety Inventory (STAI), the Liebowitz Social Anxiety Scale (LSAS) and the Social Phobia Inventory (SPIN)) at baseline and after treatment in patients with a primary diagnosis of SAD. All patients were medically healthy and free of psychiatric comorbidity. Results: 13 SAD patients (female: n=6) completed post-treatment assessments. Mean age and years of education were 28.6 (SD=7.2) and 14.7 (SD=3.1), respectively. Results from the dependent-sample t-test analysis indicated a significant reduction in both state- ($t(12)=3.251$, $p=0.007$), and trait ($t(12)=2.676$, $p=0.02$) anxiety, as well as total SAD severity (SPIN-total: $t(12)=3.332$, $p=0.006$; LSAS total score: $t(12)=3.738$, $p=0.003$). Scores on the LSAS subscales showed significant reductions in anxiety ($t(12)=4.104$, $p=0.001$) and avoidance ($t(12)=3.21$, $p=0.007$). Conclusion: Preliminary results provide observational evidence that an 8-9 week course of moclobemide (600mg daily) in SAD resulted in a significant improvement on both state- and trait anxiety, fear and avoidance behaviors as well as overall illness severity on clinical scales. This supports previous findings that pharmacological intervention with moclobemide can be effective in reducing symptoms associated with SAD when used at a therapeutic dose of 600mg.

ABSTRACT NUMBER / ABSTRAKNOMMER: 4

CLUSTER ANALYSIS OF DISORDERS CHARACTERIZED BY IMPULSIVITY IN PATIENTS WITH METHAMPHETAMINE USE DISORDER

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Background An association between methamphetamine use disorder (MUD) and impulsivity exists. MUD often present with comorbidities with impulsive features. These include impulse-control disorders; substance use disorders (SUDs); neurodevelopmental disorders, such as attention deficit hyperactivity disorder; and personality disorders, such as antisocial- (ASPD) and borderline personality disorder (BPD). Our analysis aims to delineate comorbid disorders with impulsivity in a patient-sample with primary diagnosis of MUD. Methods A cluster analysis of comorbid disorders (lifetime) with impulsive features was performed on 51 patients (female:78%). Ages ranged between 18 and 49 years (mean 29.33,SD 6.62). We investigated the demographical and clinical correlates of MUD the clusters. Results Cases were divided into 3 clusters. Cluster 1: individuals with comorbid alcohol use disorder (AUD) only (n=10). Cluster 2: no comorbid SUD or AUD (n=14). Cluster 3: multiple SUDs and AUD (n=27). Five comorbid conditions were included (BPD, ASPD, SUDs [methaqualone and cannabis] and AUD). These were the only impulsive comorbidities in this sample. Cluster-cases differed with presence of lifetime AUD (cluster 1: 100%, cluster 2: none [$p<0.001$], and cluster 3: 52%). In cluster 3, 59% of cases had lifetime cannabis use disorder and 67% methaqualone use disorder (none in clusters 1 and 2, $p<0.001$); 19% had BPD and 33% had ASPD. No cases in other clusters (BPD: $p=0.03$; ASPD: $p<0.001$). Drug use severity differed, measured by CGI ($p=0.05$) and YBOCS ($p=0.04$). Cluster 3 was worse than cluster 1 and 2 (CGI:$p=0.018$; YBOCS:$p=0.0015$). No significant differences between clusters in terms of demographics and impulsivity as measured by the UPPS-P. Conclusion Most cases fell into cluster 3. There was increased personality pathology and greater illness severity. Our findings contribute to data on impulsivity in MUD, and showed impulsivity is a heterogeneous concept, manifesting differently in different cases. In a larger sample, it may assist in selecting treatment targets.

ABSTRACT NUMBER / ABSTRAKNOMMER: 5

OXYCUTE: A BIOINFORMATICS PIPELINE TO IDENTIFY MARKERS OF OXIDATIVE DAMAGE IN PROTEOMIC DATA

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Introduction Oxidative damage has been linked to neurodegenerative diseases. It is postulated that oxidative posttranslational modifications (oxPTMs) of proteins have many effects, including loss of enzymatic activity and loss of structural integrity. Similarly, oxidative stress has been implicated in the development of Parkinson's disease (PD). Existing tools that identify posttranslational and chemical modifications of proteins generally require users to specify all possible modifications in advance; which oxPTMs are relevant to a particular sample, however, can be unclear. This may leave oxidative damage unrecognized, misleading researchers about this aspect of their samples. The aim of this project is to develop a pipeline which will enable users who do not have proteomics expertise to efficiently identify oxPTMs and provide an indication of the extent of oxidative damage in a dataset. Methods The pipeline will streamline existing bioinformatics tools to estimate the degree of oxidative damage in proteomic samples. Python and R programming will coordinate spectrum pre-processing, peptide-spectrum matching, and protein inference, optimizing the configuration of modifications to consider. To test the pipeline, we will use a proteomic dataset from three PD patients with mutations in the parkin gene as well as relevant ProteomeXchange data. Results Development of the software is in progress. A graphical user interface (GUI) will be designed to enable users to name a set of MS/MS spectra, a sequence database (FASTA format), and information about the mass spectrometer. We will show data reflecting information yielded by a database search engine (X!Tandem) and by "blind" PTM sequence tagging (TagRecon). Discussion The contribution of oxidative damage to human disease is largely understudied. More tools such as OxyCute are urgently needed for the identification of modifications that could affect protein function as this may play a critical role in the aetiology of PD.

ABSTRACT NUMBER / ABSTRAKNOMMER: 6

THE ROLE OF XHOSA SPEAKING TRADITIONAL HEALERS IN TREATING MENTAL HEALTH ISSUES IN THE WESTERN CAPE: PRELIMINARY DESCRIPTIVE FINDINGS

Alberta S. J. van der Watt (Stellenbosch University) , Irence Mbanga (Stellenbosch University) , P Das-Brailsford (George Town University) , Soraya Seedat (Stellenbosch University)

In South Africa, traditional healers (TH) treat an array of health related problems, as well as culture bound syndromes or ailments considered non-responsive to Western medicine. Given the widespread use of traditional medicine, especially among poorer population groups, it is important to explore the training, expertise, and skills of TH in managing patients with mental illness. Traditional healers (n = 39; female = 32; mean age = 54.7) were interviewed using both a structured and semi-structured interview schedule. The Patient health Questionnaire (mean = 2.8; SD = 3.9) was also verbally administered. Interview notes were typed after each interview. Quantitative data was analysed using SPSS version 24. Interview notes were analysed using thematic analysis. Eleven TH (28.2%) indicated that they had multiple immediate family members who were also TH. Healers trained for an average of 9.6 years (range = 0.5 to 38 years, SD = 9.96 years), with 15 TH (38.5%) indicating that they received their training from multiple trainers. Generally, training was described to include three stages involving going to the river and/or forest, and slaughtering goats, chickens, and/or oxen. Twenty-three (59%) TH said that they treated individuals with mental illness; no TH exclusively treated mental illness. The most prevalent methods of diagnoses are through revelations by God (64.1%) and/or ancestors (74.4%). Prayer (79.5%), herbs (87.2), and ritualistic slaughtering of animals (66.7%) are also popular treatment methods. Descriptions of treatment methods were similar among all TH. Becoming a TH was described as both an illness and a calling. While the training and processes appeared to be similar for all the TH, the descriptions came across as generic and TH seemed reluctant to provide specific details. Future research should focus on fostering trust between biomedical and traditional care providers in order to allow for more open communication.

ABSTRACT NUMBER / ABSTRAKNOMMER: 7

PARTICIPANTS' PERSPECTIVES OF WEEKLY TELEPHONIC MOOD MONITORING: A MIXED METHOD FEASIBILITY STUDY

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Background: Mood and anxiety disorders have a high lifetime prevalence and their chronicity adds to the management burden of already scarce and strained mental health care resources, particularly in developing countries. Non-professional-assisted interventions and technology (such as weekly telephonic mood monitoring) could assist in the early identification of symptoms of relapse and hospitalization prevention. Method: Semi-structured telephonic interviews were conducted with 37 participants (89.2% female; mean age = 33.1 years) at week 13 of a weekly telephonic mood monitoring feasibility study (N = 61) that spanned 26 weeks (starting one week post-discharge). Frequency and descriptive statistical analyses (using SPSS Version 24) were undertaken and qualitative data was analyzed using thematic content analysis. Results: Participants generally expressed positive experiences and perceptions of weekly mood monitoring stating that they would advise others to also take part in weekly mood monitoring. Nonetheless, some participants did make suggestions for improvement of mood monitoring while others expressed negative experiences of weekly mood monitoring. Conclusion: Participants perceived weekly mood monitoring to be helpful in lightening the burden of mood and anxiety disorders (e.g., having someone to talk to, providing insight into their disorders). Not only did it help them, but they also perceived mood monitoring to be potentially helpful to future participants. However, weekly mood monitoring was also burdensome of

itself (including being too time consuming, and having to answer questions when feeling down). In addition, the findings highlighted that participants' and researchers' perceptions and experiences may not be congruent (especially in terms of therapeutic misconception). The current findings may inform researchers' future approach to study design and participant relationships.

ABSTRACT NUMBER / ABSTRAKNOMMER: 8

MEDICAL STUDENTS' PERSPECTIVES ON EUTHANASIA AND PHYSICIAN-ASSISTED SUICIDE AND THE PROSPECTS OF LEGALISING THESE PRACTICES IN SOUTH AFRICA

Ryan Kurt Jacobs (Undergraduate student)

Background: Recent developments in the South African legal landscape makes it essential to engage with medical students and key role-players about their perspectives regarding PAS/ Euthanasia in an effort to inform policy . Objectives: This study aimed to determine the views of medical students at Stellenbosch University on the topic as these future doctors will potentially be involved in the implementation of PAS and Euthanasia policies. It attempted to ascertain whether they believe euthanasia and physician assisted suicide should be legalised in South Africa. Methods: A paper-based, semi-quantitative descriptive study design consisting of 16 questions, using a convenience sampling method of third to final year medical students at SU. First and second year students were excluded due to their lack of clinical exposure. Data collection occurred between April 2016 and March 2017, following institutional and ethics approval. Thematic analysis was used for the qualitative data while frequency tables' best capture the quantitative data. Results: The overall response rate of 69.25%. Most participants (57%) felt that patients should decide when they want to die. 52.7% felt that the practices of euthanasia and/ or PAS should be legalised in South Africa. However, 36.1% of participants stated that they would have no part in ending a patient's life while 35% said they would be comfortable with providing the patient with the correct means to end their life (PAS). The majority (80.1%) indicated that they would prefer that a dedicated ethics committee decide as to who receives euthanasia/ PAS. Conclusion: Medical students studying at SU are largely in favour of legalising PAS and euthanasia. Views of qualified medical practitioners and the views of the broader public needs to be ascertained in order to inform policy decisions regarding euthanasia and PAS practices in South Africa.

ABSTRACT NUMBER / ABSTRAKNOMMER: 9

THE USE OF WHOLE EXOME SEQUENCING TO INVESTIGATE THE AETIOLOGY OF FAMILIAL PARKINSONS' DISEASE IN A SOUTH AFRICAN AFRIKANER FAMILY

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Background: The development of high-throughput next-generation sequencing (NGS) technologies has fast-tracked the discovery of disease-causing genetic variants, making it technically and financially feasible as a means of studying Mendelian disorders like familial forms of Parkinson's disease (PD). PD is a multi-factorial neurodegenerative disorder with varied clinical features including tremor and muscular rigidity in addition to a broad spectrum of non-motor symptoms. Research has established that the known PD genes are a minor contributor to disease susceptibility in Sub-Saharan Africa, suggesting the possibility of discovering novel pathogenic PD-causing mutations. The aim of this study is to utilize whole exome sequencing (WES) technology to identify novel pathogenic

mutations in a South African Afrikaner family with an autosomal dominant form of PD. Methods: We examined an Afrikaner family with clinically confirmed PD using WES, and data was generated on the Ion Proton™ System for three affected family members. FASTQC, Samtools and ANNOVAR were employed for quality control and annotation before a stringent prioritization and filtration process was applied to the data using bioinformatic tools such as SIFT, PolyPhen-2, CADD, GERP++, Allen Brain Atlas, GeneMANIA and HGCS. Results: We have identified nine non-synonymous co-segregating variants, seven of which were bioinformatically predicted to be disease-causing. The three candidate variants that had the highest scores in terms of deleteriousness across all five prediction tools are in NRXN2, POU2F1, and CDC27. Further work such as validation of variants, and the screening of ethnically-matched controls are ongoing. Conclusions: Though genome-scale sequencing has enabled rapid identification of candidate variants, the true challenge lies in applying the appropriate filtering strategies to effectively prioritise the variants into a workable list of potentially disease-causing candidates without 'throwing the baby out with the bathwater'. Future work will involve functional studies to determine the effect of the variants in an appropriate cellular disease model.

POSTERS/PLAKKATE

ABSTRACT NUMBER / ABSTRAKNOMMER: 10

EFFECT OF HARMFUL ALCOHOL USE ON BRAIN MORPHOMETRY AMONG PEOPLE LIVING WITH HIV IN WESTERN CAPE PROVINCE, SOUTH AFRICA – A BASELINE DESCRIPTION

Georgina Spies (Stellenbosch University) , Graeme Hoddinott (Stellenbosch University) , Soraya Seedat (Stellenbosch University)

Introduction There is significant evidence that HIV is brain degenerative and long-term infection can impair cognitive functioning and cause abnormalities in brain morphology. In South Africa, alcohol remains the dominant substance of abuse and long-term use has been linked to poor neurocognitive and neuroimaging outcomes. The individual liability of alcohol and HIV on brain structure and function have been well demonstrated, however there is relatively little evidence of the potentially aggravating effects of this dual burden on brain structural and functional outcomes. Studies have indicated that various brain regions are affected by both HIV infection and chronic alcohol abuse, with a predilection for white matter damage. Alcoholism, therefore, contributes significantly to the scope of structural brain deficits present in people living with HIV. Objective The present study is on-going and sought to identify the effects of hazardous alcohol use on brain morphometry in the context of HIV infection. Method Participants (N = 39) underwent structural magnetic resonance imaging (sMRI) using a 3-Tesla whole-body scanner. Self-reported alcohol use was recorded using the Alcohol Use Identification Test (AUDIT). The sample consisted of 36 women and 3 men. Results A total of 17 (44%) participants reported no alcohol use and 22 (56%) reported drinking alcohol on the AUDIT. Results revealed a significant difference between groups for bilateral insula, bilateral posterior cingulate, bilateral hippocampi, bilateral amygdala, bilateral thalamus, left precuneus, left putamen and right calcarine. Mean volume of the aforementioned regions was significantly smaller in alcohol users compared to individuals who reported no alcohol use. In addition, there was a significant difference between groups in CSF volume, with higher mean CSF volume in the alcohol group. Conclusion Alcohol use in the context of HIV infection contributes to brain structure disruption. These preliminary data provide evidence for an interaction between HIV infection and alcohol use.

ABSTRACT NUMBER / ABSTRAKNOMMER: 11

CHILDHOOD TRAUMA AND DIFFERENTIAL EPIGENETIC MECHANISMS IN ADULTS WITH PSYCHIATRIC DISORDERS

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Childhood exposure to trauma is a known risk factor for the development of psychiatric disorders in adulthood. Biological mechanisms have been proven to contribute to the development of psychiatric disorders following early trauma exposure and epigenetic modification is a plausible mechanism mediating environmental and biological interactions. The objective of this study was to systematically review the current literature on epigenetic modifications related to childhood trauma in adults with psychiatric disorders. We reviewed all published literature up to May 2017 in four databases (PubMed, Web of Science, EBSCOhost and SCOPUS) using the following keywords and related terms: DNA methylation, epigenetics, childhood abuse, childhood neglect, early life stress, and childhood trauma. Terms related to psychiatric disorders were not included in the search to avoid narrowing the results and confining it to specified disorders. Non-human studies, studies investigating participants younger than 18 years and studies investigating childhood trauma in utero or during birth were excluded. Twenty-eight depression, suicide, posttraumatic stress disorder, borderline personality disorder, bulimia nervosa, bipolar disorder, alcohol dependence, schizophrenia and childhood trauma were included. The majority of studies found significant differences in methylation profiles between participants with and without childhood trauma. The most commonly investigated candidate genes were: serotonin transporter gene/ Solute Carrier Family 6 (SLC6A4); glucocorticoid receptor gene/ Nuclear Receptor Subfamily 3, group C, Member 1 (NR3C1); Oxytocin Transporter gene (OXTR); and Brain-Derived Neurotropic Factor (BDNF). Higher methylation in the promoter regions of genes were generally associated with higher exposure to childhood trauma in the majority of studies. All studies were cross-sectional by design and longitudinal studies is needed in future to infer causality. Discrepancies related to: the instruments used to diagnose psychiatric disorders and measure childhood trauma; the method of analysis used to determine differential epigenetic mechanisms; and tissue type used may have limited the generalisability of the results.

ABSTRACT NUMBER / ABSTRAKNOMMER: 12

EFFECTS OF CANNABIS USE ON BODY MASS, FASTING GLUCOSE AND LIPIDS DURING THE FIRST 12 MONTHS OF TREATMENT IN SCHIZOPHRENIA SPECTRUM DISORDERS

Freda Scheffler (Stellenbosch University)

Background: General population studies suggest that cannabis use is associated with reduced risk of obesity and other cardiometabolic risk factors. Methods: We investigated the relationships between cannabis use and body mass index (BMI) and metabolic parameters in 109 antipsychotic naïve or minimally treated patients with schizophrenia, schizophreniform or schizo-affective disorder who were treated according to a standard algorithm with depot antipsychotic over 12 months. Participants with a positive urine toxicology test for cannabis at any time during the study (n=40), were compared with those who tested negative (n=69), in terms of changes in BMI, fasting blood glucose and lipids, and rates of metabolic syndrome risk factors. Results: There was a significant group*time effect (p=0.002) with the cannabis negative group showing a greater increase in BMI, after adjusting for age, sex, methamphetamine use and modal dose. There were no group*time effects for fasting blood glucose or lipids. Post hoc tests indicated significant increases in fasting blood glucose and triglycerides and, decrease in high-density lipoprotein cholesterol for the cannabis negative group. Rates of metabolic syndrome did not differ significantly, although more cannabis negative patients had elevated waist-circumference at endpoint (p=0.003). Conclusions: While our findings could

reflect an indirect effect such as dietary neglect and smoking, it is possible that cannabis use directly suppresses appetite, thereby reducing food intake.

ABSTRACT NUMBER / ABSTRAKNOMMER: 13

THE ROLE OF HIV-1 VPR IN PREDICTING NEUROCOGNITIVE DECLINE AND THE INFLUENCE OF CHILDHOOD TRAUMA AND APOE GENOTYPE: A LONGITUDINAL STUDY OF SOUTH AFRICAN WOMEN

Dr Georgina Spies (The University of Stellenbosch) , Lara Clauss (The University of Strasbourg, The University of Stellenbosch) , Prof Dr Sian Hemmings (The University of Stellenbosch) , Prof Dr Soraya Seedat (The University of Stellenbosch) , Prof Dr Susan Engelbrecht (The University of Stellenbosch)

South African women are particularly vulnerable to experiencing both childhood trauma (CT) and infection with human immunodeficiency virus (HIV). Long-term infection with HIV may lead to HIV-associated neurocognitive disorders (HAND). Recently, HIV-1 viral protein R (Vpr) has been implicated both as an important determinant of neurocognitive outcome and as a potential therapeutic target. Apolipoprotein E (ApoE) genotype is a well-known indicator of genetic risk for neurocognitive decline. This study aims to delineate the role of HIV-1 Vpr single nucleotide polymorphisms (SNPs) in neurocognitive function and the influence of CT and ApoE on neurocognitive status and Vpr. South African women (n = 73) were assessed at baseline and follow-up for neurocognitive function and childhood trauma using neuropsychological tests and the Childhood Trauma Questionnaire. Peripheral blood samples were collected at each session. These were Sanger sequenced to determine Vpr sequences and HIV subtype. After controlling for age and education, amino acid changes in Vpr were correlated with neurocognitive function and neurocognitive decline over time. CT and ApoE genotype were investigated as covariates. Surprisingly, neurocognitive function improved significantly from baseline to follow-up. We found a trend for better attention/working memory over time with neuroprotective Vpr amino acids, compared to worse function with neurovirulent Vpr. While neither CT nor ApoE genotype showed significant influences on Vpr amino acid-dependent neurocognitive function, we discovered that years seropositive significantly correlated with SNPs in Vpr. The trend in attention/working memory matches prior findings, though our small sample size, the sex of our participants and their viral clade may have limited our ability to determine significant correlations. In future, it would be would be especially interesting to conduct longitudinal analyses of SNPs in Vpr and functional investigations using neuroimaging, alluding to potential underlying mechanisms. It is hoped that this first investigation will spur further research in the area.

ABSTRACT NUMBER / ABSTRAKNOMMER: 14

INVESTIGATING CORRELATIONS BETWEEN BIOLOGICAL AGE AND CHILDHOOD TRAUMA: A STUDY IN SOUTH AFRICAN ADOLESCENTS

Erin Manolas (Stellenbosch University) , Jacqueline Womersley (Stellenbosch University) , Lindi Martin (Stellenbosch University) , Sian Hemmings (Stellenbosch University) , Soraya Seedat (Stellenbosch University)

Introduction: Anxiety disorders are characterised by abnormal and inappropriate anxiety in the absence of anxiety-provoking stimuli. Previous research has identified risk factors for the development of anxiety disorders, including childhood trauma (CT) and anxiety proneness (AP), which refers to both the tendency to react in an anxious manner as well as fear of anxiety-related symptoms. Given that anxiety disorders are both common and associated with significant impairment, it would be useful to identify a biological correlate of AP. Telomeres are short repetitive nucleotide sequences that cap the end of chromosomes to maintain genomic stability. Both CT and anxiety have

been associated with telomere attrition, a marker of biological aging. Therefore, we intend to investigate whether telomere shortening may be a biological correlate underlying the relationship between CT and AP. Methods: Study participants (n = 63) were recruited as part of a larger study on anxiety in Cape Town adolescent high school students. Participants underwent interview-based neuropsychiatric assessments administered by a trained psychologist, and were selected for the current study based on self-reported levels of AP and CT. Telomere length and the reference gene, human β-globin, will be measured via polymerase chain reaction using DNA obtained from peripheral blood samples. The relationships between AP, CT and telomere length will be analysed using linear models. Results and conclusion: Experimental determination of telomere length will commence shortly. We anticipate that our results will provide information on the influence of telomere length attrition, a biomarker of aging, on AP in the context of CT.

ABSTRACT NUMBER / ABSTRAKNOMMER: 15

POSSTRAUMATIC STRESS DISORDER, SOCIAL ANXIETY DISORDER AND CHILDHOOD TRAUMA DIFFERENCES IN SUBFIELDS

Fatima Ahmed-Leitao (Stellenbosch University) , Melanie Marx (Stellenbosch University) , Soraya Seedat (Stellenbosch University)

Introduction: Little research has been carried out looking at volumetric changes in the hippocampus for Social Anxiety Disorder. The research that has been carried out has revealed contradictory results. We looked at hippocampal subfields for underlying volumetric differences in the hippocampus in PTSD, SAD with and without trauma, and compared this to healthy controls. Our hypothesis was that PTSD would demonstrate significant hippocampal subfield changes compared to all groups and furthermore that SAD with trauma would demonstrate significant subfield alterations compared to SAD without trauma. Method: Participants (N=90) were selected from the same cohort of an existing study by fellow researchers at Stellenbosch University, and underwent structural magnetic resonance imaging (sMRI). The sample consisted of 17 participants with PTSD, 22 with SAD and early developmental trauma, 26 SAD without early developmental trauma and 25 healthy controls. We used Freesurfer v.6 to assess hippocampal subfield volumes and SPSS v.24 to conduct analysis to calculate the possible significant volumetric differences in hippocampal subfields. Results: Results revealed a statistically significant volumetric reduction for the PTSD group in the right parasubiculum compared to the SAD without trauma group, and left HATA compared to controls as well as SAD with trauma group. We did not find any significant reductions between the SAD with and SAD without trauma groups. Conclusion: As hypothesised, we found significant results to further demonstrate atrophy associated with the hippocampus in PTSD. From this, we are able to use this research to better understand the hippocampus in PTSD. Despite trauma not being shown to have any significant atrophy in hippocampal subfields, this may be due to our small sample size, it may however be that the effect of trauma is not as much a defining variable as we may have once thought, therefore, further analysis should be carried out.

ABSTRACT NUMBER / ABSTRAKNOMMER: 16

THE INFLUENCE OF CHILDHOOD TRAUMA, MAJOR DEPRESSIVE DISORDER AND TELOMERE LENGTH ON HIV-ASSOCIATED NEUROCOGNITIVE DISORDERS

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Background: HIV-associated neurocognitive disorders (HAND) continue to prevail despite improved access to antiretroviral therapies. Research has suggested that this is in part due to the complex interactions between stress-related exposures and depression, which may aggravate the development of neurocognitive impairment. Telomere length attrition is a marker of biological aging that has been independently associated with childhood trauma (CT), depression and HAND. We therefore sought to investigate whether telomere shortening may act as a biomarker for HAND when examined in the context of CT and depression. Methods: HIV-positive (n=105) and negative women (n=95) underwent a battery of neuropsychological tests to measure cognitive function, CT and depression. Quantitative polymerase chain reaction using primers specific to telomeric repeats and the reference gene human β-globin was performed on DNA extracted from peripheral blood mononuclear cells. Baseline differences in relative telomere length and neuropsychological parameters were assessed by t-test while the relationships between telomere length, cognitive function, CT and depression were probed using multiple linear regression models. Data were analysed using the R statistical language with p-values of less than 0.05 deemed significant. Results: HIV-positive individuals self-reported higher levels of CT ($t(182.48) = -6.437$, $p<0.001$) and depression ($t(196.65) = -3.410$, $p<0.001$) and were found to have shorter relative telomere lengths ($t(193.11) = 5.398$, $p<0.001$). The interaction of CT and depression explained significantly more of the variance in global cognitive scores across participants ($p=0.035$). Furthermore, this interaction indicated that depressive symptoms were associated with worse cognitive performance in HIV positive individuals with a history of CT. Including the interaction between CT, depression and telomere length produced a trend towards explaining more of the variance in global cognitive score ($p=0.076$). Conclusions: Our data suggest that HIV is associated with decreased telomere length and that the interaction between this biomarker and psychological ill health may influence cognitive status.

ABSTRACT NUMBER / ABSTRAKNOMMER: 17

ALCOHOL AND/OR COCAINE USE DISORDER AND THE EFFECTS OF COMORBIDITY ON TREATMENT OUTCOMES IN PATIENT POPULATIONS

Erine Bröcker (Stellenbosch University) , Martin Kidd (Stellenbosch University) , Soraya Seedat (Stellenbosch University) , Susanne Young (Stellenbosch University)

Introduction: Research shows that individuals diagnosed with Substance Use Disorders (SUD) and a comorbid disorder have poorer treatment outcomes. Comorbidity in SUD has shown to lead to earlier treatment attrition, greater craving and relapse. Studies have also shown that individuals with high self-efficacy are more likely to apply coping skills and are less likely to relapse. The role of comorbidity within SUD samples and its relationship to treatment outcomes remains poorly understood. This study aimed to explore the effects of comorbidity in individuals with SUD on treatment outcomes. Methods: Participants were inpatients of a private drug/alcohol rehabilitation clinic situated in Somerset West, South Africa. The study sample consisted of 72 abstinent patients, aged 18-55, diagnosed with alcohol and/or cocaine dependence. The groups were subdivided according to comorbidity (yes/no). Self-reported self-efficacy scores pre and post treatment were examined using the Alcohol and Cocaine Self Efficacy Scales. Results: No group differences were found with regard to clinical and demographic measures, and neither with regard to comorbidity rates. Overall, self-rated efficacy to abstain from Alcohol use improved significantly over time ($F(1.61) = 5.17$, $p=.03$). Post hoc analyses revealed that both the Alcohol and the Alcohol AND Cocaine groups without comorbidity significantly improved with regard to self-efficacy whereas the individuals with comorbidity did not improve. The group with comorbidity reported no change in self-efficacy over time. Overall, self-rated efficacy to abstain from Cocaine use improved significantly over time ($F(1.59) = 13.48$, $p<.01$). Post hoc analyses revealed that only the Alcohol AND Cocaine combination group without comorbidity improved significantly on self-efficacy at discharge whereas the patients with comorbidity did not improve. Conclusion: Patients diagnosed with Alcohol Use Disorder and/or

Cocaine Use Disorder significantly improved with regards to clinical outcomes after inpatient treatment. Limitations of the study and recommendations for future research are discussed.

ABSTRACT NUMBER / ABSTRAKNOMMER: 18

PROSPECTIVE INTER-EPISODIC MOOD MONITORING IN PATIENTS WITH BIPOLAR DISORDER: FEASIBILITY STUDY

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Objectives: Our primary objective was to assess the feasibility of inter-episodal telephonic mood monitoring in bipolar disorder in a middle income country. Secondary objectives included gathering data on longitudinal mood trajectories and assessing patient acceptance of monitoring. Methodology: Inpatients with a primary mood or anxiety disorder were recruited pre-discharge. Assessment at intake included demographic information, the Life Events Checklist (LEC), and the Childhood Trauma Questionnaire (CTQ). Participants telephonically complete the Altman Self-Rating Mania Scale (ASRM) and Quick Inventory of Depressive Symptomology (QIDS-SR 16), weekly, for 26 weeks. Units of alcohol consumed and life events were recorded. Semi-structured interviews were conducted mid-way through the mood monitoring protocol. Results: Of the 61 eligible participants (77% female; mean age = 35.3 years), 28 completed 26 weeks of telephonic mood monitoring. Thirty-three participants (54.1%) withdrew prematurely or were lost to follow-up. Males were more likely to terminate study participation prematurely. The mean CTQ score in the sample was indicative of moderate to severe abuse and neglect. The mean number of DSM defining traumatic events was 8.6. Despite the significant decline in depression scores over 26 weeks, participants endorsed persistent mild to moderate depressive symptoms. Throughout the study, ASRM scores did not indicate significant mania. Suicidality (as measured by QIDS item 12) was highest at week 3 and week 12 post-discharge for those who completed 26 weeks of monitoring. Statistically, participants who were married/in a relationship had higher depression scores. Conclusion: Inter-episodal telephonic mood monitoring can provide useful information to track progress, encourage medication adherence, and manage early warning signs of relapse. Reliable communication is a challenge in this setting. Further research is required to determine the benefit of weekly mood monitoring on mood fluctuations.

ABSTRACT NUMBER / ABSTRAKNOMMER: 19

META-ANALYSIS: RISK OF INSOMNIA AND SOMNOLENCE WITH SECOND GENERATION ANTIDEPRESSANTS

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Objective: Our goal was to quantify the risk of insomnia and somnolence associated with commonly used antidepressant agents and examine the impact of medication class, pharmacodynamics and dose on risk of sleep related side-effects. ⇔Data Sources and Study Selection: We conducted a PubMed search to identify double-blind, randomized, placebo-controlled trials examining the efficacy of second generation antidepressant medications for adults with depressive, anxiety disorders or OCD.⇔Data Extraction: We used a random-effects meta-analysis to examine the pooled risk ratio of insomnia and somnolence reported as a side-effect with second generation antidepressants compared to placebo. We used stratified subgroup analysis and meta-regression to examine the effects of medication type, class, dosage, indication, and receptor affinity profile on the measured risk of insomnia and somnolence. ⇔Results: We identified 129 trials involving 24,458 adults. SNRIs (Relative Risk (RR) = 2.29, 95% CI: 1.97 – 2.67, $z = 10.75$, $p < 0.001$) were more likely to cause insomnia than SSRIs (RR = 1.77, 95% CI: 1.60 – 1.97, $z = 10.85$, $p < 0.001$). Risk of insomnia was inversely associated with medication affinity to the Serotonin Transporter (SERT) and M3 receptor.

SNRIs (Relative Risk (RR) = 2.42, 95% CI: 2.08 – 2.80, z = 11.7, p < 0.001) were associated with a similar risk of somnolence as SSRIs (RR = 2.26, 95% CI: 2.04 – 2.51, z = 16.8, p < 0.001). Risk of somnolence was associated with medication affinity for the 5-HT1A receptor. Increased dosing of SSRI was associated with significantly increased risk of insomnia (but not somnolence) whereas increased doses of SNRI were associated with significantly increased risk of both insomnia and somnolence.

ABSTRACT NUMBER / ABSTRAKNOMMER: 20

EMOTION PROCESSING IN A NON-CLINICAL SAMPLE OF OLDER ADOLESCENTS WIH HIGH AND LOW LEVELS OF BOTH ANXIETY PRONENESS AND CHILDHOOD MALTREATMENT: AN EXPLORATORY NEUROIMAGING STUDY

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Introduction: fMRI studies suggest that youth with maltreatment histories and with elevated levels of anxiety proneness (AP) demonstrate deficits in emotion processing. We investigated the unique and combined effects of childhood maltreatment (CM) and AP on emotion processing in a non-clinical sample of adolescents. Methods: Seventy-eight right-handed adolescents completed an fMRI emotion processing task in which they rated neutral, negative and positive images. Adolescents were categorized into four groups based on high and low levels of CM and AP. Task performance and functional activation in bilateral amygdala, hippocampus and insula, in response to viewing correctly matched emotionally salient images (i.e. positive and negative relative to neutral images) were assessed and compared across groups. Results: A trend for greater activation in the right amygdala in response to negative (p=0.07) and positive (p=0.09) images was evident for those with high AP levels compared with those with low AP levels. However, no significant main effects or interaction effects were evident in terms of activation in the amygdala, hippocampus or insula in response to negative and positive images. Also, no significant main effects or interaction effects on task performance were evident and no significant differences in task performance (i.e. matching accuracy and reaction times) were evident across the four groups. Neither CM nor AP scores were significantly correlated with task performance or functional activation outcomes. Conclusion: Healthy adolescents with high and low levels of CM and AP perform comparably in terms of processing emotional content, such as negative and positive images, relative to neutral images. The trend for greater activation in response to emotionally salient images in the right amygdala, evident in those adolescents with heightened levels of AP, irrespective of CM level, suggests that right amygdala hyperactivity may be a neural correlate of AP and a potential biomarker of risk for anxiety disorders.

ABSTRACT NUMBER / ABSTRAKNOMMER: 21

GENE-BY-ENVIRONMENT INTERACTION OF BDNF Val66MET POLYMORPHISM AND CHILDHOOD MALTREATMENT ON ANXIETY PRONENESS IN A MIXED RACE ADOLESCENT SAMPLE

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Introduction: Anxiety disorders in youth are attributable to multiple causal mechanisms, comprising biological vulnerabilities, including genetics and temperament; and unfavourable environmental influences, such as childhood maltreatment (CM). A gene-environment (G x E) interaction study was conducted to determine the interactive effect of the BDNF Val66Met polymorphism and CM to

increase susceptibility to anxiety proneness (AP) in a sample of mixed race adolescents. Methods: Participants (n=308, mean age: 15.8 years) who were all secondary school students and who completed measures for AP and CM were genotyped for the BDNF Val66Met polymorphism. Multiple linear regression models were used to assess G x E influences on AP. Age and gender were included in the models as covariates as age was significantly associated with AP total score ($p<0.05$), and females had significantly higher AP scores than males ($p<0.05$). Results: A main effect of CM on AP was evident ($p<0.01$), however, no main effect of BDNF genotype on AP was observed ($p>0.05$). There was a trend toward significance for a G x E effect on AP, with Met66 allele carriers who endorsed high levels of CM, tending to have higher AP scores than Val66 homozygotes ($p=0.06$). Conclusion: Our results suggest that BDNF Val66Met may have a moderating role in the relationship between early adversity and increased risk of anxiety-related phenotypes, and by implication, anxiety disorders. Given the exploratory nature of this study, findings require replication in larger samples and adjustment for population stratification so as to confirm the role of BDNF Val66Met and CM on AP in mixed race adolescents.

Theme 6 / Tema 6

Perioperative Sciences / Perioperatiewe Wetenskappe

Oral Presentations/ Referate

ABSTRACT NUMBER / ABSTRAKNOMMER: 1

BURDEN OF SPINAL TUBERCULOSIS IN THE WESTERN CAPE: IS IT ON THE DECLINE?

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Background: Tuberculosis (TB) of the spine is estimated to account for only 1% of all TB cases. However, the absolute burden of spinal TB may be considerable in regions with an exceptionally high TB burden, such as the Western Cape Province. Anecdotal reports suggest that spinal TB is indeed a common pathology in tertiary orthopaedic units, however the true burden has not been investigated. The current study aimed to assess the burden of spinal TB cases at tertiary hospitals in the Western Cape between 2012 and 2015. Methods: This retrospective review used clinical records to identify new cases of spinal TB seen at Tygerberg Hospital, Groote Schuur Hospital and Red Cross War Memorial Children's Hospital between January 2012 and December 2015. Cases were classified as bacteriologically confirmed or clinically diagnosed based on diagnostic evidence and were reported in total and per year, with accompanying clinical and demographic information. Results: A total of 393 cases of spinal TB were identified within the 4-year period, including 319 (81%) adults and 74 (19%) children <15 years. Cases were classified as 72% bacteriologically confirmed and 28% clinically diagnosed spinal TB. Adult cases decreased year-on-year with 105 cases in 2012 and 56 cases in 2015. However, child cases remained approximately stable with 16 cases in both 2012 and 2015. Among adults, 46% had ≥3 vertebrae involved with 27% receiving corrective surgery. Among children, 54% had ≥3 vertebrae involved and 49% received corrective surgery. Conclusion: Western Cape tertiary hospitals have experienced a high absolute burden of spinal TB cases in recent years. Adult cases appear to be declining, however no similar trend was observed amongst child cases. Findings suggest a high proportion of severe presentation, particularly among children. Spinal TB remains a public health concern with increased vigilance required for earlier diagnosis of child cases.

Ethics approval number: N15/07/062

ABSTRACT NUMBER / ABSTRAKNOMMER: 2

CEREBROSPINAL FLUID PROTEIN ANALYSIS IN TUBERCULOUS MENINGITIS

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Background: The goal of the study is to ascertain whether there is a difference in cerebrospinal fluid (CSF) protein levels between cranial and lumbar CSF and to quantify what levels of protein will obstruct ventriculoperitoneal shunts in Tuberculous meningitis (TBM). A 30 year prospective analysis was performed.The protein levels in the CSF were analyzed to determine if there was a correlation between these levels and shunt obstruction. A secondary aim was to ascertain whether there was a difference in CSF obtained from lumbar puncture versus ventricular CSF. This would allow us to determine in advance which CSF diversion procedure could be utilized and whether elevated lumbar CSF protein would be a predictor of ventricular CSF protein and hence a predictor of shunt failure. In total, 214 children and 376 adults underwent VP shunting for TBM. 27.5% and 25.5% of children and adults sustained blocked shunts respectively. Mean protein levels in CSF gathered from the non-obstructed group was 1.76 g/l whereas levels of 2.94 g/l were present in the blocked shunt group.

Mean CSF protein in ventricular samples gathered perioperatively in obstructed shunt patients was 2.471 g/l. Mean CSF protein obtained from lumbar puncture was 2.474 g/l. Patients with elevated CSF protein are at a high risk of VP shunt blockage. In these patients, temporizing measures such as serial lumbar punctures, external ventricular drainage may be employed until CSF protein levels decrease. These procedures may even lead to shunt avoidance. Lumbar CSF protein levels are an accurate predictor of ventricular CSF protein.

Ethics approval number: S16/06/102

ABSTRACT NUMBER / ABSTRAKNOMMER: 3

THE ROLE OF QUANTIFERON®-TB GOLD AND TUBERCULIN SKIN TEST AS DIAGNOSTIC TESTS FOR INTRAOCULAR TUBERCULOSIS IN HIV-POSITIVE AND HIV-NEGATIVE PATIENTS IN SOUTH AFRICA

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Purpose: To compare QuantiFERON®-TB Gold (QFT) and tuberculin skin testing (TST) as diagnostic tests for intraocular tuberculosis (IOTB) in HIV positive and negative patients. Methods: A prospective study evaluating two different tests to help diagnose intraocular tuberculosis Results: Thirty-five of 106 patients (33.0%) were diagnosed with IOTB including 11 (31.4%) with HIV infection and a median CD4+ cell count of 249 x 106/L. HIV- cases were more likely than HIV+ cases to have a positive QFT result (p=0.04). The median CD4+ count of HIV+ cases with negative QFT results (93 x 106/L) was lower than that of HIV+ cases with positive QFT results (415 x 106/L) (p=0.005) Patients were 6.95 times more likely to have IOTB if TST alone was positive (p<0.001) versus 2.19 times more likely if QFT alone was positive (p=0.04). TST showed superior specificity (60.3% vs 33.3%) (p=0.001) but similar sensitivity (90.3% vs 85.7%), positive (54.9% vs 40.5%) and negative predictive values (92.1% vs 81.5%) compared to QFT. If both the QFT and TST were positive patients were 3.92 times more likely to have IOTB (RR=3.29; 95% CI 2.04-7.52) (p<0.001) than if both were negative. If both the QFT and TST were positive the specificity (73.2%) and diagnostic accurary (74.0%) were better than if TST alone was positive but these differences were not statistically significant. Conclusions: In South Africa with its high HIV burden and limited public health resources QFT should not replace TST as it provides little additional diagnostic information at a much higher cost.
Ethics approval number: N13/10/146

ABSTRACT NUMBER / ABSTRAKNOMMER: 4

XYLOCAINE 10% PUMP SPRAY AS TOPICAL ANAESTHETIC FOR VENEPUNCTURE PAIN

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Background: Cutaneous analgesia for venepuncture pain can be achieved using various topically applied local anaesthetic formulations. Xylocaine® 10% Pump Spray containing lignocaine hydrochloride and 95% ethanol, is exclusively recommended for mucosal anaesthesia. However, this formulation is readily able to penetrate skin. Methods: We investigated whether topical pre-treatment with Xylocaine® 10% Pump Spray could facilitate analgesia for venepuncture. A double blind, randomized controlled trial was performed on one hundred patients. The control and intervention groups had 0,5ml saline and 0,5ml Xylocaine® applied to preselected venepuncture sites. A 20-minute application time was used. Pain associated with an 18-gauge cannula venepuncture was rated on an 11-point Numerical Rating Scale. A two-point or 30% reduction in pain would be deemed

clinically significant. Results: Pain scores were lower (p = 0.001) in the Xylocaine (median 2; 95% CI 2-3) than the saline (median 4; 95% CI 3-5) group. Moderate to-severe pain occurred in fewer Xylocaine® (18%) than saline (42%) treated patients (relative risk 0.43, CI 0.22 to 0.48; NNT = 5). Conclusion: Topical Xylocaine® 10% Pump Spray pre-treatment provided a time-effective method of reducing venepuncture associated pain.

Ethics approval number: M15/07/023

ABSTRACT NUMBER / ABSTRAKNOMMER: 5

ABDOMINOPERINEAL RESECTION IN THE PRONE POSITION: EARLY OUTCOMES AT A TERTIARY INSTITUTION IN THE WESTERN CAPE, SOUTH AFRICA

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Introduction: Abdominoperineal resection (APR) in the prone position is a new technique in the developing world, where colorectal cancer incidence is rising fast and the patient population is different from those in the developed world. Literature is lacking on the outcomes of this technique under these conditions. Aim: Analysis of early outcomes after prone abdominoperineal resection for rectal cancer at a tertiary institution in the Western Cape, South Africa. Methods: All patients who underwent APR in the prone position for rectal adenocarcinoma from February 2011 to February 2017 were reviewed. Main endpoints were stage at presentation, neoadjuvant treatment, circumferential resection margin involvement, perineal wound complications, length of intensive care unit (ICU) stay and duration of post-operative hospital stay. Results: 54 Patients were included in the study. Average age of patients was 57yrs (range 29-79yrs). Neoadjuvant (NA) chemoradiation was given in 54% while 14% of patients only received NA chemotherapy and 10% short course neoadjuvant radiotherapy. The average stage at presentation for rectal cancer was stage 3B. The circumferential resection margin (CRM) was involved in 14.8% (8/54) of patients. Perineal wound infection was identified in 25% (14/54) of patients and perineal wound dehiscence in 14%. Average length of ICU stay was 4.9 days and patients were discharged on average 10.7 days post operatively. Conclusion: Patients in the developing world present with more advanced stage rectal cancer. Complete resection rates for rectal cancer after APR in the prone position compare well to those achieved in developed countries. A high perineal wound complication rate was seen in this series. The high percentage of patients with locally advanced disease necessitating neoadjuvant radiotherapy possibly contributed to this finding.

Ethics approval number: S15/03/066

ABSTRACT NUMBER / ABSTRAKNOMMER: 6

A RETROSPECTIVE STUDY ON THE EFFICIENCY OF THE ORTHOPAEDIC EMERGENCY THEATRE

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Introduction: The division of Orthopaedics at Tygerberg Hospital is the busiest orthopaedic trauma unit within Southern Africa with an average of 45 patients awaiting emergency surgery on any given day. As it is important to treat these patients effectively, the aim of this study is to quantify the burden of orthopaedic related trauma procedures and highlight areas of inefficiency Methods: A retrospective review of the orthopaedic emergency theatre activities was performed over a 6-month period (October 2015 to March 2016). Basic descriptive data such as operation date, operative procedure performed, time under anaesthesia, length of operation (cutting time), presence of a delay between cases and reason for said delay, was collected. Results: A total of 1173 patients were

operated in the emergency theatre. The mean duration of anaesthetic time was 114±78 minutes, mean cutting time of 72±65 minutes, with an average delay of 74±94 minutes between cases. The mean time difference between initiation of anaesthesia and commencing surgery was 23 minutes. The reasons for delay between cases were predominantly due to nursing (n=109) as well as equipment related factors (n= 62) Conclusion: Theatre efficiency during said period was extremely poor with serious delays between cases. In a resource restrained setting with very restricted theatre availability, accelerated turnaround time is essential. Although the main cause for delay between cases was discovered to be nursing related factors, the equipment shortage was also highlighted as a major barrier to emergency theatre efficiency. Subsequently numerous theatre efficiency incentives were initiated, thus future research is indicated to assess the effect of these initiatives.

Ethics approval number: U17/02/011

ABSTRACT NUMBER / ABSTRAKNOMMER: 7

A FIVE YEAR RETROSPECTIVE AUDIT OF MITRAL VALVE REPAIR SURGERY AT TYGERBERG HOSPITAL

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Background: Mitral valve repair(MVRep) is well established as the preferred treatment modality for patients with degenerative mitral valve disease(MVP) requiring intervention. Valve repair offers a distinct event-free survival advantage compared with replacement. Little data on management/outcome of MVP requiring surgery in South Africa(SA). The aim is to describe/compare the indications, pathology and outcomes in MVRep. Methods: All patients referred to cardiothoracic surgery for MVRep at TBH, Cape Town from 01/12/2010to30/06/2015 was retrospectively included. Demographics, cardiovascular risk factors, preoperative(NYHA)functional class, pre/postoperative transthoracic/transoesophageal echocardiographs, immediate in hospital and six-months post-surgical mortality were analysed. Results: A total of 147patients were considered for MVRep by the local heart team,114 patients were accepted for MVRep.106 of 114 underwent surgery,6 defaulted, 2 refused surgery. Of those accepted; 57.9% males, 42.1% females, mean age 47.7years. 44.7%had hypertension, 43.9% smokers and 21.1% known IHD. 56.1% had a preoperative NYHA functional class III, 29.8%class II,7%class IV, and 7%class I.60.2% had a six-month postoperative NYHA functional class I, 32.3%class II, 5.4%class III, 2.2%class IV. 58.8%had MVP, 31.6% with flail segment due to chord rupture, 25.4% with myxomatous degeneration, 18.4% with infective endocarditis, 15.8% with rheumatic heart disease, 9.6% with ischemic mitral regurgitation, 3.5% with fibroelastic deficiency, and 24.6% had no clear etiology. P2 was the most common segment involved in 36% of patients followed by A2. The immediate-postoperative survival is 95.3% versus 93.4% at 6months. The mortality rate at 30days and 6months' postoperative was 4.7% and 6.6% respectively. a significant association between bileaflet involvement and MVRep-failure(p=0.006) when using transoesphgeal echocardiogram. Annuloplasty-ring was the most common intervention (87.7%) followed by chordal-insertion (45.5%). Conclusion: Tygerberg Hospital have comparable survival rates, operative mortality, surgical methodology for MVRep with international institutions, minor variation in intraoperative conversion to mitral valve replacement, a significant association between bileaflet involvement and MVRep-failure that might require further assessment.

Ethics approval number: s16/07/113

ABSTRACT NUMBER / ABSTRAKNOMMER: 8

ANCESTRAL VARIATIONS IN THE LOCATION AND SIZE OF THE MENTAL FORAMEN IN SOUTH AFRICANS

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Introduction: The mental foramen (MF) is integral to perioperative planning of dentomaxillofacial surgeries involving the body and symphysis of the mandible. However, ancestral variations in the location of the MF have not been documented using dry mandibles in the South African population. This study aimed to quantify ancestral differences in the location and size of the MF in a South African cohort comprising African descents (AD), mixed descents (MD) and European descents (ED). Methods: Measurements were conducted bilaterally on dry mandibles (N = 325) using parameters such as the distances from the MF to the alveolar crest (AC - MF), the symphysis (SM - MF), the inferior border (MF - IM), the posterior border (MF - PM), and the vertical (MF - V) and horizontal (MF - H) diameters of the MF. The mean parameter values were compared between AD and MD, MD and ED as well as ED and AD. Results: Results show that AD have significantly higher mean values than MD for both the AC – MF and MF – IM measurements on right sides of mandibles. The MF – PR measurement was significantly higher in MD when compared to ED on both left and right sides, while the mean values of parameters SM – MF, MF – PR and AC - MF on both left and right sides of the mandible were significantly lower in AD when compared to ED. Mean values for parameters MF – V and MF – H show no significant difference between ancestral groups ($p > 0.05$). There were significant differences in the location of the MF in between South Africa subpopulation groups. More so, the difference was apparent between AD and ED. Conclusion: These findings could assist a population-specific perioperative planning, in the prevention of iatrogenic injuries during dental surgeries in under-equipped facilities in South Africa.

Ethics approval number: S13/05/100

ABSTRACT NUMBER / ABSTRAKNOMMER: 9

A SURVEY OF PROPOFOL PRACTICES WITH REGARDS TO APPROPRIATE ASEPTIC HANDLING: IMPACT OF THE 2014 SASA GUIDELINES FOR INFECTION CONTROL IN ANAESTHESIA IN SOUTH AFRICA

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Background: Propofol is a lipid emulsion that has the potential to support bacterial growth. Various outbreaks of postoperative infection have been attributed to external contamination of propofol during routine handling by anaesthetic practitioners. The 2014 SASA Guidelines for Infection Control in Anaesthesia in South Africa specifically address precautions to be taken when administering propofol. Methods: We distributed an electronic survey to SASA members to determine the prevalence of high risk propofol administration practices in comparison with awareness and application of the current SASA infection control guidelines. Application of a risk scoring system allowed us to categorize respondents who administer propofol by infusion into low, moderate, high and very high risk groups. Results: The majority (65%) of respondents were classified as moderate risk, 29% as low risk and 6% as high and very high risk combined. Most (61.3%) were aware of the guidelines of which 47.3% had studied them. The Studied-Guidelines group had a greater proportion of respondents who were categorized as low risk (58.4% vs. 45.2%, $p = 0.0026$) and a lower proportion who were categorized as moderate risk (38.4% vs. 50.8%, $p = 0.0045$). Although statistically significant, differences in risk scoring were small and likely not clinically important. Conclusion: The impact of the guidelines is unlikely to have been clinically significant. This obviates the need for more extensive publicity highlighting the publication of these guidelines and their practical importance.

Ethics approval number: S15/09/198

ABSTRACT NUMBER / ABSTRAKNOMMER: 10

BONY ANATOMY OF THE THIRD METACARPAL AND RELATIONSHIP WITH THE CAPITATE: A COMPUTED TOMOGRAPHY STUDY

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Background: The aim of this study was to describe the anatomy of the third metacarpal and the capitate and their relationship to each other in the context of modern wrist arthroplasty. The data generated has deepened our understanding of the normal anatomy and the variability in normal population. Methods: This was a retrospective, descriptive study of wrist and hand CT scans of 100 patients that were imaged for various clinical indications, mostly radius fractures. The images were aligned to produce the equivalents of 'true' antero-posterior and lateral views produced with plain film radiography. Measurements of the third metacarpal were taken manually by a single investigator. Morphologic type of the metacarpal was also noted. Results: The mean length measurement of the third metacarpal was 63.6mm (SD 4.4mm). The mean distance from the base of the metacarpal to the isthmus of the canal was 26.5mm (SD 2.5mm). We found a strong correlation between the total length of the metacarpal and the distance of the isthmus from the base, showing that the isthmus of the medullary canal is a consistent feature. Cortical thickness, proximally, in the sagittal plane, had a mean measurement of 5.5mm (SD 0.9mm). Minimum value was 3.4mm, maximum value was 8mm. We found an inverse correlation between the patient's ages and the thickness of the cortical bone in the proximal third. The mean angle measurement formed by the third metacarpal and the capitate, in the sagittal plane, was +7.259 degrees. Maximum value: +20.18 degrees(apex dorsal), minimum value: -6.2 degrees (apex volar). Conclusion: The angles formed between showed a wider variability than expected but appears to be normally distributed. Consideration should be given to the carpal alignment in a specific patient and implant design and surgical technique should be tailored, as there is wider variability than was previously known.

Ethics approval number: S16/01/006

ABSTRACT NUMBER / ABSTRAKNOMMER: 11

SINGLE-OPERATOR CHOLANGIOPANCREATOSCOPY: A GRADING OF ITS CLINICAL VALUE AT A SINGLE HIGH VOLUME CENTER

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Background: Single-operator per-oral cholangiopancreatoscopy (SOPCP) enables direct biliopancreatic ductal visualization, targeted tissue sampling, and therapeutic intervention. Since its introduction in 2005, this advanced technology has been used extensively at Karolinska University Hospital. Procedural success and adverse events when using SOPCP have been established, but the degree to which it alters clinical management remains to be investigated. The main aim of this study was to describe the clinical value of SOPCP in the diagnosis and treatment of biliopancreatic disease in a single high volume center. We furthermore described adverse events related to the procedure. Methods: All SOPCP procedures performed between March 2007 and December 2014 were retrospectively reviewed for diagnostic yield and therapeutic value. This was accomplished using a novel 4 grade scale. For diagnostic procedures, the impact on clinical decision-making was determined, and for therapeutic procedures, the impact on clinical course. Intra- and postprocedural adverse events were graded according to the American Society for Gastrointestinal Endoscopy severity grading system. Results: During the study period, 365 SOPCP procedures were performed. We found SOPCP of pivotal importance (grade 4) in 19 % of cases, and of great clinical relevance (grade 3) in 44 % of cases. SOPCP did not affect clinical decision-making or alter clinical course (grade 1 and 2) in 37 % of cases. We found an overall adverse event rate of 16.2 %. Conclusion: For

patients with complex biliopancreatic disease SOPCP adds clinical value in 64% of cases. This large single institution experience establishes its use in routine clinical practice, with awareness of the 16.2% adverse event rate. Our results encourage further critical exploration of specific patient populations that might benefit most from SOPCP use.

Ethics approval number: dn 2014/55-31/4

ABSTRACT NUMBER / ABSTRAKNOMMER: 12

THE DEMOGRAPHICS AND OUTCOMES OF BURN PATIENTS ADMITTED TO WORCESTER HOSPITAL

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RC DUVENAGE (Department of General Surgery, Worcester Provincial Hospital, Worcester & Ukwanda Rural Clinical School, Stellenbosch University)

Introduction: Worcester Hospital is a regional healthcare facility in the Western Cape, South Africa, without a dedicated burns unit. Currently there is limited data available of burns patient management outside of academic institutions in South Africa. Study aim: To describe the incidence, demographics and determine the outcomes of burns patients admitted to Worcester Hospital. Methods: A retrospective descriptive study of burns patients admitted to Worcester Hospital between 1 September 2016 and 25 June 2017 (Stellenbosch University HREC #N16/10/138). Results: Burns consisted of 42 patients (1,8%) of a total of 2291 surgical admissions for this time period. The mean age was 38 years (range 0 – 93years) and predominantly male (57%). The mechanism of injury was mostly thermal (93%), 29 open flame and 10 hot fluids, with a mean TBSA of 19,5% (range 1 – 86%). 7 patients (16,7%) required critical care unit admission. The burns median length of stay was 4,5 days (range 1 – 30 days) versus the overall admissions of 2 days. 25 patients (60%) required spilt skin grafts and the mean TBSA area grafted was 5% (range 1 – 14%). The median time from admission to first surgical procedure was 24 hours (range 2 – 156 hours). The in-hospital mortality rate was 23,8% with 9,5% transferred to a tertiary level burns unit. Conclusion: Burn injuries treated at Worcester Hospital are often severe and require significant resources. This study supplies critical information regarding the burden of burn related injuries managed at a regional level.

Ethics approval number: N16/10/138

ABSTRACT NUMBER / ABSTRAKNOMMER: 13

APPRAISAL OF MAMMAPRINT IN A DEVELOPING COUNTRY: A FIRST PERSPECTIVE

Y BAITCHU* (Division of Surgery, Stellenbosch University)

Background: Outcome series of decisions based on genetic profile tests (MammaPrint/70GP) with medium-term follow-up are rare. We here present patients with follow-up of 70GP from a developing country. Methods: From 2006 to 2016, patients with histopathologically confirmed breast cancer (cT0-3 and cN0-1) at a breast centre in South Africa were selected for 70GP and the decision to proceed with adjuvant systemic treatment was made on a case by case basis. Results: In total there were 154 patients, 140 luminal type, 13 HER2 type and one triple negative; 57.8 % were 70GP Low risk and 42.2 % were High risk. There were no mortalities in either group. Adjuvant chemotherapy was not given to 98.8% of the low risk group and was given to 95.3% for the High risk group. After a mean follow-up of 54.1 months, there were 3 systemic recurrences (all skeletal metastases) and they were all in the high risk 70GP group that were given chemotherapy. Two patients each had two tumours in the same breast with divergent 70GP and were treated in accordance with the High risk result. This remains an area poorly understood in the literature. Six patients showed discordant 70GP and FISH

results for HER2 where three patients did not receive Trastuzumab in light of the 70GP result and none of these patients showed evidence of recurrence. Conclusion: It may be reasonable to replace IHC for ER, PR and HER2 with 70GP profiling especially in light of borderline expression.

Ethics approval number: N09/06/166

ABSTRACT NUMBER / ABSTRAKNOMMER: 14

SKIN DISINFECTION PRACTICE BEFORE LOCAL ANAESTHETIC TO SKIN PRIOR TO CENTRAL NEURAXIAL BLOCKADE: A SURVEY OF SOUTH AFRICAN PRACTICE

D COETZEE* (Department of Anaesthesiology and Critical Care & Department of Health)

Introduction: Infectious complications following central neuraxial block, although being of low incidence, may have devastating consequences to the patient. The purpose of this study was to survey the proportional use of two different methods used to disinfect the skin before the administration of a local anaesthetic agent to the skin overlying the area where the central neuraxial block will be performed. Methods: Ethics approval was obtained prior to commencing the study. An electronic, web-based questionnaire in the form of a survey was distributed to various anaesthetic departments in various government teaching hospitals in South Africa. Descriptive statistics were used on the raw data using the Fisher exact test to measure associations between the different categorical variables. Results: A significant response rate of 60.3% was achieved. Regarding subarachnoid blocks, little more than half of the participants (52.0%) utilize the isopropanol method whereas less than half of the participants utilize the isopropanol method when performing an epidural block. Discussion: The relevance of this study in clinical practice is that it establishes what the current routine practice of skin disinfection prior to anaesthetizing the skin to facilitate CNB in the different institutions, particularly the teaching institutions, is. By doing so, the study also introduces and establishes the available methods the "reasonable anaesthesiologists" utilizes for skin disinfection and anaesthesia before the performance of a CNB.

Ethics approval number: S15/08/183

POSTER PRESENTATIONS / PLAKKAATAANBIEDINGS

ABSTRACT NUMBER / ABSTRAKNOMMER: 15

A CADAVERIC SIMULATION OF THE POPLITEAL BLOCK

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V TCHOKONTE-NANA (Division of Anatomy and Histology, Stellenbosch University)

Background: popliteal block (PB) is the block of the sciatic nerve (SN) in the popliteal fossa, suitable for foot, ankle and lower-leg surgery. Despite its advantages, this technique is scarcely used; one of the reasons is the variations in the level of the sciatic nerve bifurcation. The success of the PB depends on the proximity of the tip of the needle with the main trunk of the SN. This study aims to establish an anatomical correlation between the PB approaches and the SN bifurcation. Methods: For this, three approaches to the PB were simulated on 22 lower limbs using dyes made of silicone in combination with different pigments corresponding to each approach. Following the simulations, the posterior thighs were dissected to observe the level of the SN bifurcation as well as the proximity of the dye with the point of bifurcation. The distance between the dye and the SN was measured and recorded. The block was considered successful when the dye was located prior and proximal to the bifurcation of the nerve. Results: The results showed that in all specimens, the SN division occurred in the popliteal fossa and at an average distance of 47.95 ± 22.50 mm above the popliteal crease.

There was no statistical difference between the PB approaches (p >0.05). The dye in all the approaches was found before the bifurcation of the nerve in all specimens. Conclusion: In conclusion, the occurrence of SN division in the popliteal fossa predisposes to about 95 to 100% success rate of the PB, if the needle is inserted at approximately 7 cm above the popliteal crease.

Ethics approval number: S16/03/052

ABSTRACT NUMBER / ABSTRAKNOMMER: 16

QUANTITATIVE AND QUALITATIVE PLATELET DEFECTS ASSOCIATED WITH HIV INFECTION: A SOUTH AFRICAN PERSPECTIVE

C STEADMAN* (Department of Anaesthesiology and Critical Care, Stellenbosch University)

Introduction: South Africa has a high prevalence of Human immunodeficiency virus (HIV) infection (12.2%) and many (20-25%) of these patients will require surgery at some stage in their lives. The pre-operative preparation with regards to special investigations (particularly platelet count) prior to performing regional anaesthesia in this population of patients are not standardized throughout South Africa. The primary outcome of this study was to investigate the quantitative and qualitative effects HIV infection has on platelets in South Africa. Secondary aims were to: 1. Determine if there was any correlation between CD4 count and platelet count and function. 2. Determine the influence highly active antiretroviral therapy (HAART) might have on Platelet count and function. Methods: This is a single-centered, retrospective and prospective observational study. definitions of thrombocytopenia in this study include a platelet count of < 150x109.L-1 , while and a platelet count of <75x109.L-1 is considered as severe thrombocytopenia and a contra-indication to performing neuraxial anaesthesia. A pilot study was undertaken to determine the effect of HIV on platelet function, as the exact prevalence of platelet dysfunction in HIV is unknown. Ten patients were enrolled in the pilot study. Results: Platelet counts: 1. For the entire sample, the mean platelet count was 270±100 x109/L 2. Platelet count was less than 150x109/L in 91 (6.5%) of study participants. 3. Platelet count was less than 75x109.L in 10 (0.7%) of participants. Platelet function: All the specimens submitted for analysis were found to be within normal limits. Conclusion: Our results therefore indicate that it is not necessary nor cost effective to perform platelet counts on all HIV positive patients requiring neuraxial anaesthesia. We also suggest that it is firstly impractical and secondly not cost effective to perform routine platelet aggregometry prior to performing neuraxial anaesthesia on HIV positive patients

Ethics approval number: S15/01/013

ABSTRACT NUMBER / ABSTRAKNOMMER: 17

BLOOD PRESSURE MEASUREMENT IN THE OBESE PATIENT: A COMPARISON BETWEEN THE NON-INVASIVE PROXIMAL FOREARM AND RADIAL ARTERIAL BLOOD PRESSURE MEASUREMENT

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Background: South Africa has a high prevalence of obese adults. When these (obese) individuals present to a health care facility, blood pressure measurement will play an important role during routine medical evaluation. Accurate non-invasive blood pressure monitoring is a challenge in obese individuals secondary to inaccurate readings associated with inappropriate cuff size, structural differences of the upper arm as well as short upper arm length. Our aim was to identify an accurate, affordable, minimally invasive and low risk blood pressure monitoring modality in obese patients. Methods: This study included 30 patients with a body mass index of greater or equal to 30 kg/m2 presenting for surgery or staying in a High Care Unit at Tygerberg Hospital. In all of these patients an intra-arterial line formed part of their routine care. We compared the (mean, systolic and diastolic) blood pressures readings from the proximal forearm, with the gold standard, being intra-arterial blood pressure readings. Results: There was poor agreement between the mean intra-arterial blood

pressure measurement and the NIBP measured at the forearm. The mean NIBP measured at the forearm over estimated the intra-arterial blood pressure reading by 2% (±8.1 %. P 0.031) The computed upper and lower levels of agreement between the 2 methods ranged from -22.5 to 18.4%. Systolic NIBP measurements at the forearm overestimated the IABP measurements by 0.9% (P 0.295). Upper and lower levels of agreement between the 2 methods ranged from -19.3 to 17.5%. Larger discrepancies between 2 methods were observed for diastolic blood pressure measurements with a mean difference of -5.8% (P <0.0001). Conclusion: We therefore cannot recommend that the forearm NIBP reading be used as an accurate, non-invasive and cost effective way to measure accurate blood pressure in obese patients.

Ethics approval number: S15/05/099

Theme 7 / Tema 7

Maternal and Child Health/

Moeder- en Kind Gesondheid

Oral Presentations/ Referate

ABSTRACT NUMBER / ABSTRAKNOMMER: 1

LONGTERM FOLLOW-UP OF ANTI-MÜLLERIAN HORMONE LEVELS IN PATIENTS WHO HAD SURGERY FOR ENDOMETRIOMA

Gerhard Hanekom (Stellenbosch University - Obstetrics and Gynaecology), TI Siebert (Stellenbosch University - Obstetrics and Gynaecology)

Background:Endometriomas are the ovarian phenotype of endometriosis, found in 44% of women with endometriosis. Cystectomy is the preferred management of endometriomas, decreasing pain and recurrence. Cystectomy is now being questioned because it could remove ovarian tissue in the absence of a well-defined cyst capsule. Anti-Müllerian hormone (AMH) produced by granulosa cells of antral follicles in the ovary is used to quantify the effect of surgery on ovarian reserve. Methods:This is the longterm follow-up of a previously recruited prospective cohort undergoing laparoscopic cystectomy for endometriomas. Primary outcome: decline of ovarian reserve measured by AMH more than 12 months after surgery. Secondary outcome: pregnancy rate and recurrence. All patients had sonographic confirmation of uni- or bilateral endometrioma. Clinical and demographic data were collected, surgery was done laparoscopically. All patients underwent uni- or bilateral cystectomy. Patients were included if 3 AMH values and details of pregnancy and recurrence at last follow-up were available.Results:A total of 26 patients were included in the final analysis: mean age of 33 years. 84% underwent the initial surgery because of pain while 43% presented with infertility. In 65% of patients the endometriomas were unilateral and bilateral in 35%. The mean length of follow-up was 23 months, there were 8 pregnancies in 19 patients still trying to conceive (42%). The mean pre-operative AMH value was 2,59 ng/ml, at 6 months: 1,36 and at last follow-up 1,13 ng/ml.Conclusion:Ovarian cystectomy for endometriomas appears to have a detrimental effect on the ovarian reserve as measured by AMH. This decline seems to be the biggest during the 6 months following surgery. It also appears that there is no recovery of AMH values even at longterm follow-up leading us to conclude that the damage done to the ovarian reserve in these cases is permanent.

ABSTRACT NUMBER / ABSTRAKNOMMER: 2

Echocardiographic Assessment of Left Ventricular Function in Pre-Eclampsia Complicated by Pulmonary Oedema – Findings from the LV IMPACT Study

Anton Doubell (Stellenbosch University and Tygerberg Hospital - Division of Cardiology, Department of Medicine), Bradley Griffiths (Stellenbosch University and Tygerberg Hospital - Division of Cardiology, Department of Medicine), Eduard Langenegger (Stellenbosch University and Tygerberg Hospital - Division of Maternal Health), Philip Herbst (Stellenbosch University and Tygerberg Hospital - Division of Cardiology, Department of Medicine)

INTRODUCTION: Acute pulmonary oedema as a complication of pre-eclampsia carries significant risk to mother and foetus. Currently the cause is unknown. Published data on echocardiographic (echo) findings in this setting suggest left ventricular (LV) systolic and diastolic dysfunction may play a role.HYPOTHESIS:We hypothesise that pulmonary oedema complicating pre-eclampsia is associated with the presence of LV dysfunction.METHODS:Patients presenting to Tygerberg Hospital with pre-eclampsia and pulmonary oedema between February 2016 and February 2017 were prospectively enrolled. Identified pre-existing cardiac disease or an alternative cause for pulmonary oedema were exclusion criteria. An echo was performed as soon as possible after diagnosis, with a follow up echo 2 months later. Two control groups are currently being enrolled: pre-eclampsia without pulmonary oedema, and no pre-eclampsia.RESULTS:21 patients met eligibility criteria during the enrolment period, with a mean age of 28. The mean time from pre-eclampsia diagnosis to pulmonary oedema diagnosis was 40 hours. The mean time from pulmonary oedema diagnosis to echo was 28 hours. LV

ejection fraction (LVEF) estimation by Teicholz method was possible in all patients, with an LVEF <50% found in 8/21 (38%). LVEF estimation by Biplane method was possible in 14/21 (67%), with an LVEF <50% found in 3/14 (21%). Evidence of diastolic dysfunction was found in 10/21 (48%). At follow up, 4/11 (36%) showed improvement in LV systolic function, and 4/11 (36%) showed deterioration. Improvement in diastolic function was seen in 7/11 (64%).CONCLUSIONS:LV function in patients with pre-eclampsia and pulmonary oedema varies widely, from normal to significantly and persistently abnormal. This likely represents the heterogeneous nature of the condition. Data from the control cohorts will help to further define this group.

ABSTRACT NUMBER / ABSTRAKNOMMER: 3

LABOUR EPIDURAL ANALGESIA IN A STATE HOSPITAL IN SOUTH-AFRICA: NOT A "NUMBERS GAME"

Stephan van Zyl (University of Stellenbosch, Department of Health, Western Cape, Tygerberg Hospital - ANESTHESIOLOGY AND CRITICAL CARE)

Background: A 2012-audit on labour epidural analgesia rates in Tygerberg Hospital revealed that only 2.2% of labouring parturients received epidural analgesia. This unacceptably low number necessitated a dedicated epidural service which was subsequently initiated in June 2014 by the Department of Anesthesiology to improve the quality of care in labouring patients.Methods: A retrospective follow-up audit was conducted from June 2014 to December 2015 and included data on epidural rates, indications, complications and patient satisfaction. Comparison was made with the 2012 data to evaluate the impact of change on care provided and to recommend future changes.Results: Labour epidural rates improved to 5.16% for the audit-period, with 2014 and 2015 rates being 7.44% and 3.89% respectively. Daytime epidurals have doubled in 2014/2015 and complication rates decreased from 32.3% in 2012 to 16%. Primary indications for epidurals included preeclampsia, morbid obesity, primigravity and cardiac conditions. Although 99.8% of complications were minor and transient, one fatality was reported during the audit period.Discussion: Epidural analgesia for woman in labour is seen as the gold standard method for pain relief and in first world countries such as the USA rates are as high as 70-80%. Multiple factors play a role in the extremely low numbers we have achieved over recent years but the initial audit and subsequent changes has made it possible to identify areas for improvement in the epidural service at TBH. We observed an important increase in epidural rates with the dedicated epidural service but ideal targets for our high-risk obstetric setting is yet to be determined when challenges such as resource optimization as well as patient and staff education is taken into account. With the fatal incident in mind, the authors concluded that patient safety should never be compromised over numbers!

ABSTRACT NUMBER / ABSTRAKNOMMER: 4

A Retrospective Audit of Post Caesarean Section Sepsis at Tygerberg Hospital

Marsel Coetzer (Stellenbosch University / Tygerberg Hospital - Obstetrics & Gynaecology), Linda R Murray (Stellenbosch University / Tygerberg Hospital - Obstetrics & Gynaecology)

Introduction: Caesarean section (CS) remains the most important individual risk factor for developing pregnancy related sepsis. According to the 2015 Saving Mothers Annual Report, pregnancy related sepsis is the 3rd leading cause of direct maternal deaths in South Africa.Aim: This retrospective study aimed to audit post-CS sepsis at Tygerberg Hospital in order to determine the incidence rate, as well as to describe the risk-factor profile and determine the outcome of women who develop post-CS sepsis. Results: A total of 811 patient records were audited and 38 women with post-CS sepsis were identified. The cumulative incidence rate for post-CS sepsis was therefore 4.69%. Patient characteristics illustrated the high-risk nature of the patient population served by Tygerberg Hospital, with a high incidence of known risk factors for post-CS sepsis such as obesity, hypertension and HIV. Upon analysis of individual demographic, medical, surgical and obstetric risk factors, untreated HIV infection was associated with significant increased risk (RR 5.83, p=0.005, CI 1.72 – 19.77). Thirty-

three of the 38 women with post-CS sepsis were treated as inpatients and 12 required repeat surgery or admission to a high care or intensive care unit.Conculsion: Despite a post-CS sepsis incidence rate that compares well with high-income countries (4.69% vs. 3.5 – 8.11%) post-CS sepsis remains a significant contributor to maternal morbidity in the South African setting. Risk factors for post-CS sepsis are multifactorial and in the setting of a referral hospital, all women should be treated as potentially at risk. Optimization of antiretroviral treatment and chronic medical conditions, vigilant intra-partum care, meticulous surgical technique and recognition of early signs of post-CS sepsis are essential in order to prevent maternal morbidity.Future Research: Further prospective research is needed to identify risk factors specific to the population served by Tygerberg Hospital.

ABSTRACT NUMBER / ABSTRAKNOMMER: 5

Post-placental insertion of CopperT 380A intrauterine copper device—a retrospective study at Tygerberg Hospital, Cape Town, South Africa

Michelle Bryan-Mc Innes; Judy Kluge (tygerberg hospital - obstetrics and gyanecology)

The Copper-T 380A intrauterine contraceptive device (Cu-IUCD) is a safe and effective long-acting reversible form of contraception (LARC). It is used by over 100 million women worldwide so it is of great concern that in South Africa the use of IUCD is <2%.In 2012 progestogen-only injectables and IUCDs were the only LARCs available in South Africa. A new protocol for post-placental insertion of the Cu-IUCD (PPIUCD) was introduced in Tygerberg, Cape Town in 2012 to encourage the uptake of this method. The purpose of this study was to audit the implementation of this protocol and outcomes, which included rate of return and complications.According to the IUCD register, 523 women had the IUCD inserted between June 2013 and February 2014. Only pregnancies that were >24 weeks of gestation or >500 g were included. In all, 481 women's records were analysed as 35 had notes missing and seven were excluded. Of these 481 women, 437 had an IUCD inserted. Antenatally only108 women opted for the Cu-IUCD and most women only made the decision to have the IUCD inserted around the time of delivery (301) There were emergency caesarean sections (312) compared with elective caesarean section (66) and vaginal deliveries (57).There were 39 cases identified with puerperal sepsis (8.6%) of which 20 (4.5%) were readmitted and five were diagnosed with endometritis (1.1%). In four of these five cases, the IUCD was removed but in all five there was complete resolution. All five women had signs of sepsis before the IUCD insertion and should not have received an IUCD according to the protocol.Only 116 (24.6%) returned for follow-up at Tygerberg with three expulsions (2.5%) and five partial expulsions (4.2%), 22 devices (18%) were removed for various reasons and there were no identified perforations.

ABSTRACT NUMBER / ABSTRAKNOMMER: 6

Outcome of monochorionic twins and twins of undetermined chorionicity in a South African setting

Zoe Momberg (Stellenbosch University - Obstetrics & Gynaecology)

Background: Limited research on the outcomes of twin pregnancies of undetermined chorionicity (UC) has been performed. This is a common clinical scenario in the developing world, where access to skilled first trimester ultrasound to determine chorionicity is not widely available. Many centres manage UC pregnancies as monochorionic (MC), thus requiring increased surveillance and earlier delivery. The aim of this study was to evaluate any differences in perinatal outcome between groups in our context.Methods: A retrospective comparison of UC and MC twin pregnancies that received ultrasound surveillance at Tygerberg Academic Hospital during 2011 was performed. Comparisons of various demographic and outcome measures for the two groups were performed using student t-tests and Chi-squared tests. Gestational age at delivery was assessed using a Kaplan Meier survival analysis.Results: 72 UC and 62 MC pregnancies were analysed. The UC pregnancies received their first and formal ultrasounds later in gestation than the MC group. Compared to the UC group, the MC group had lower birth weights (mean 1620g vs 1954g,p<0.001) and delivered 18 days earlier

(p<0.001). Of the pregnancies that continued beyond 36 weeks, the majority were in the UC group (32 vs 11,p=0.02). The majority of the MC antenatal losses occurred pre-or peri-viability with no losses > 1500g. The MC twins had a significantly higher perinatal loss rate than their UC counterparts (p<0.001) but postnatal survival was not different between groups (p=0.22). Conclusion: The significant difference in twin antenatal survival between the two groups suggests that MC and UC pregnancies may not need to be managed with equivalent strategies. Given the absence of antenatal losses in the UC group, we could consider postponing delivery in the UC group from 36-37 weeks until 37-38 weeks, while maintaining the current ultrasound surveillance regime. Further prospective research is warranted to justify changes in policy.

ABSTRACT NUMBER / ABSTRAKNOMMER: 7

INVESTIGATING THE POSSIBLE IMMUNOACTIVE AND IMMUNOMODULATORY PROPERTIES OF VARIOUS SURFACTANTS

Lyne van Rensburg (Stellenbosch University - Division of Clinical Pharmacology, Department of Medicine), Johann van Zyl (Stellenbosch University - Division of Clinical Pharmacology, Department of Medicine), Johan Smith (Stellenbosch University - Department of Pediatrics, Tygerberg Children's Hospital)

Background: The lungs present an immunological challenge for the host as they are most frequently targeted by pathogens. Alveolar macrophages are critical to pulmonary host defense and innate immunity. In addition to improving pulmonary mechanics, its components have also been seen to modulate innate pulmonary immunity. The use of exogenous pulmonary surfactants has also been proposed as possible drug carriers for anti-tubercular drugs. Purpose: To evaluate the potential anti-inflammatory effects of exogenous surfactants on the lipopolysaccharide- (LPS) stimulated and un-stimulated rat alveolar macrophage (AM) cell line NR8383 as well as human BAL derived AM. Methods: Exogenous surfactants (Curosurf®, Liposurf® and Synsurf®) standardised to phospholipid content of 500-1,500 µg/ml were incubated with LPS- (1 µg/ml) stimulated and un-stimulated NR8383 AMs and human BAL derived AM over a 24H exposure period. Proteomics was employed to detect protein expression. Results and Conclusion: Exogenous surfactants inhibit secretion of pro-inflammatory cytokines and influence the production of ROS in NR8383 AMs. The inhibitory effect of surfactants on cytokine secretion was displayed in a dose-dependent manner as well as a threshold effect was seen for all three surfactants. This may result from unique mechanism of decreasing cell signalling or up-regulating anti-inflammatory activity. Thus, indicating that the anti-inflammatory activity of surfactant products used in the treatment of neonatal respiratory distress syndrome (RDS) may depend upon the specific preparation or dose used.

ABSTRACT NUMBER / ABSTRAKNOMMER: 8

PMTCT and clinical profile of hospitalized HIV-infected children in an era of high pMTCT uptake and efficacy

Elri du Plooy (Department of Paediatrics and Child Health, Tygerberg Children's Hospital and Stellenbosch University - Paediatrics and Child Health)

Background: Combination antiretroviral therapy (cART) for HIV-infected women, with infant prophylaxis, has been standard of care to prevent mother-to-child transmission of HIV in the Western Cape since May 2013. Despite high uptake and coverage, transmission still occurs. By describing young infected children, we aimed to highlight transmission risk factors, identify diagnostic and care-pathway failures, and describe associated morbidity and mortality.Methods: Between February 2015 and January 2016, we documented the hospitalization of children younger than 18 months with confirmed HIV. Data on maternal and child HIV-history and child clinical status were collected and descriptive analysis performed.Results: Sixty-three children were screened; 55 enrolled. Median age was 5.7 (IQR 3-12.5) months; 33 (60%) were male. Forty-six children (83%) were HIV-exposed at birth. Thirty-one mothers (67%) were aware of their HIV-diagnosis prior to pregnancy. Twenty

(65%) attended antenatal care, with 7 (23%) interrupting cART initiated prior to pregnancy.Children with unknown HIV-exposure risk were older: 9.3 (5.9–12.8) vs 4.5 (2.2–12.6) months (p=0.167). Fifteen (27%) were diagnosed neonatally. Known exposure-risk children were diagnosed at 1.8 (0.1–3.5) versus 9.4 (6.6 -12.1) months (p=0.001). Unknown risk children had a median WAZ score of -3.4(-4.2 - -2.3) vs -2.4(-4.1 - -1.8), (p=0.228) and 8 (89%) had WHO stage 3/4 disease versus 36 children (78%) with known risk (p=0.195). Median duration from HIV-diagnosis to cART-initiation was 8 (5 – 30) days in known-risk children; 15/46 (27%) were in care, on cART prior to admission; Five (9%) defaulted previous cART. Fourteen children (25%) required intensive care admission; seven (13%) died.Conclusion: We identified poor antenatal clinic attendance and maternal cART-treatment interruption as the driver of new infant HIV-infection. Despite early diagnosis, child-mortality and morbidity were high. Identifying and supporting these women before, during and after pregnancy is the challenge. Enhanced infant post-exposure prevention guidelines are needed.

ABSTRACT NUMBER / ABSTRAKNOMMER: 9

Comparing the demographic and diagnostic profile of new patients attending a neurodevelopmental clinic in 2009 and 2016

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Background: There is limited data available regarding the demographic and diagnostic profile of children with developmental disabilities in South Africa and other low to middle income countries. Research in this area could identify needs and assist allocation of limited healthcare resources. Objectives: We compared the change in demographic and diagnostic profile of new patients attending a neurodevelopmental clinic (NDC) between two 12 month periods: 2008/2009 and 2016. Methods: We conducted a retrospective descriptive cross sectional folder review of new patients seen at the NDC at Tygerberg Hospital paediatric outpatients. We compared information obtained from the clinical records for two twelve month periods: July 2008 to June 2009 and January 2016 to December 2016. Results: 84 children were seen during the 2008/2009 period and 240 children during 2016. The median age of presentation was 62 months (IQR 31-92) in 2008/2009 and 53 months (37-67) in 2016. The 2008/2009 study period saw 59.5% of participants residing in the Tygerberg health district versus 36.7% in 2016. In 2016, subsequent to the addition of Khayelitsha health sub-district as a referral drainage area for Tygerberg Hospital, 20.4% of participants originated from that health sub-district. An increasing proportion of patients were referred by Allied health professionals (30.4% versus 16.4% in 2008). A total of twenty six diagnostic categories were identified, with Autism spectrum disorder (ASD) showing greatest increase over the study periods: 10 children (8.4%) in 2008/2009 compared to 84 (35%) in 2016. Conclusion: There has been a significant increase in neurodevelopmental referrals over the past 8 years, which cannot be completely explained by change in referral areas. The number of children diagnosed with autism spectrum disorder has disproportionately increased. The reasons for this require further investigation.

ABSTRACT NUMBER / ABSTRAKNOMMER: 10

Health supervision received by children with Down syndrome followed up at Worcester Provincial Hospital from 2010 to 2015.

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Background: In 2011, the American Academy of Paediatrics (AAP) revised guidelines for health supervision of children with Down syndrome (DS). In the absence of South African guidelines, we

described the health supervision received by children with DS at a regional (level 2) Western Cape Hospital and compared it to the AAP guidelines. Methods: This was a 5 year retrospective survey of the implementation at the DS clinic at Worcester Provincial Hospital (WPH) of the 2011 AAP recommendations, specifically related to cardiac, thyroid, hearing and haematological disorders. Data was extracted from patients' medical folder and the NHLS Database. The proportion receiving screening components was compared between the children using WPH as their primary care facility and children referred from peripheral hospitals. Results: Sixty-two children received care at WPH DS clinic during the study period. Thirty-six (58%) children lived in Worcester while 26 (42%) were referred from peripheral hospitals. The median age at first clinic visit was 0.5 years (IQR 0.2-1.2) and the median duration of follow up was 1.8 years (IQR 0.3-4.8). Forty nine children (79%) had a screening echocardiogram performed, the median age at first echocardiogram was 0.8 years (IQR 0.2-1.4). Five (13.9%) children from WPH compared to no children from the peripheral hospitals received the echocardiogram within the first month of life (p =0.056). Those requiring cardiac surgery were operated at a median age of 2yrs (IQR 0.9-2.3). Compared to the AAP guidelines, within the first month of life 17 (27.4%) children had a thyroid screen, 20 (32.3%) children had a full blood count and 7 (11.3%) children had a hearing assessment. Conclusion: AAP recommendations for health supervision in DS are challenging to achieve within our local health system. The development and advocacy for a South African DS health supervision guideline might improve the care of children with DS.

ABSTRACT NUMBER / ABSTRAKNOMMER: 11

Healthcare-associated infections in paediatric and neonatal wards: a point prevalence survey at four South African hospitals

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Background: Healthcare-associated infections (HAIs) cause substantial morbidity, mortality and health cost. The prevalence of neonatal/paediatric HAI at South African district and regional hospitals is unknown. Methods: An HAI point prevalence survey (PPS) was conducted in neonatal and paediatric wards at two district and two regional hospitals in the Western Cape, South Africa during December 2016 applying National Healthcare Safety Network definitions. HAI events and antimicrobial therapy active at 8 am on the PPS day [point] and during the preceding seven days [period]) were documented. Provisions for hand hygiene (HH) and HH compliance rates were observed on each ward using the World Health Organization's HH surveillance tool. Results: Pooled point and period HAI prevalence was 10% (95% CI 6-15.8; 15/151) and 12.6% (95% CI 8-18.9; 19/151) respectively. Hospital-acquired pneumonia (5/15; 33%), bloodstream infection (3/15; 20%) and urinary tract infection (3/15; 20%) were predominant HAI types. Risk factors for HAI were: history of recent hospitalization (8/19 [42%] vs 17/132 [13%]; p< 0.001) and underlying co-morbidity (17/19 [89%] vs 72/132 [54%]; p<0.004). HH provisions (handwash basins/alcohol handrub) were available and functional; HH compliance was higher in neonatal than paediatric wards (151/243 [62%] vs 115/250 [46%]; p< 0.001). Overall HH compliance rates were highest among nurses (152/263 [63%]) and mothers (46/107 [43%]) versus doctors (29/103 [28%]). Conclusion: Neonatal and paediatric HAI are frequent adverse events at district and regional hospitals. This at-risk population should be prioritized for HAI surveillance and prevention through improved infection prevention practices and HH compliance.

ABSTRACT NUMBER / ABSTRAKNOMMER: 12

The population effect of HIV exposure in HIV-uninfected children on infant mortality in South Africa

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Introduction: The population of HIV-exposed-uninfected (HEU) infants accounts for >20% of the South African infant population. HEU infants are at greater risk for mortality and morbidity than HIV-unexposed (HU) infants, with these trends persisting despite maternal antiretroviral therapy and uptake of safer breastfeeding. We aimed to quantify the population effect of excess HEU infant mortality in South Africa. Methods: Population attributable fraction (PAF) for infant mortality due to HIV-exposure in HIV-uninfected infants was estimated for the year 2013 using standard formulae and the following assumptions: prevalence of infant HIV exposure 23%; rate of perinatal HIV transmission 3%; relative risk for mortality in HEU compared to HU infants 1.8. To calculate excess infant deaths due to HIV-exposure the PAF was applied to the 2013 South African infant mortality rate after removing the proportion of infant mortality occurring in HIV-infected infants, assumed to be 8%. Additionally, a South African demographic model was used to estimate the proportion of all infant mortality due to excess deaths in HEU infants from 1990-2015.Results: The PAF [lower bound; upper bound] of South African infant mortality due to HIV-exposure in HIV-uninfected infants in 2013 was 15.1% [2.2; 28.2] and excess infant deaths due to HIV-exposure were estimated to be 4.9 [0.6; 11.2] per 1000 HIV-uninfected infants. According to the South African demographic model, the proportion of all South African infant mortality due to excess mortality in HEU infants increased from 0.4% in 1990 to 13.8% in 2015. Conclusion: At a population level the excess mortality in HEU compared to HU infants may account for 15% of all infant mortality in HIV-uninfected children and may be increasing the infant mortality rate by 5 deaths per 1000 infants. At these rates, excess mortality in HEU infants is accounting for a greater proportion of mortality than infant HIV-infection.

ABSTRACT NUMBER / ABSTRAKNOMMER: 13

Tuberculosis infection is inversely associated with atopic symptoms in HIV positive and negative South African children

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Background: The potential relationship between Mycobacterium tuberculosis (M.tb) infection and atopy is thought to result from M.tb eliciting a T-helper 1 immune response, stimulating cytokines to suppress differentiation of T-helper 2 (Th2) cells. The Th2 immune response forms the basis of atopy. Objectives: To measure the association between M.tb infection and reported atopic symptoms in children in a high-burden tuberculosis setting.Methods: 1093 children aged 3 months to 15 years living in urban Cape Town were prospectively investigated through household contact tracing for M.tb infection with tuberculin skin testing (TST). Parental reported symptoms of atopy were evaluated 3 and 6 months later using a questionnaire based on the standardized International Study of Asthma and Allergies in Childhood questionnaire.Results: An inverse association was found overall, between TST positive status (TST+) at enrolment, and reported wheeze at 3 months (OR 0.60, 95% CI 0.40 – 0.88) and at 6 months (OR 0.55, 95% CI 0.35 – 0.85), and eczema at 3 (OR 0.42, 95% CI 0.21 – 0.80) and 6 months (OR 0.51, 95% CI 0.27 – 0.99) in univariable analysis. TST+ at month 3 and reported hay fever at month 3 were also inversely related (OR 0.43, 95% CI 0.20 – 0.93). In multivariable analysis, baseline TST+ was inversely associated with reported wheeze at 6 months, controlling for age, ethnicity, HIV infection and prior tuberculosis (aOR 0.55, 95% CI 0.35 – 0.85). No inverse association was found between baseline TST+ and any reported atopic symptoms in the subgroup of children younger than 2. Conclusions: We demonstrate a robust inverse association

between M.tb infection and reported atopic symptoms in African children older than 2 years in a cohort study.

ABSTRACT NUMBER / ABSTRAKNOMMER: 14

Stool culture has limited diagnostic value in children with suspected pulmonary tuberculosis

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BackgroundBacteriological confirmation of Mycobacterium tuberculosis is achieved in the minority of young children with tuberculosis (TB), as specimen collection is resource-intensive and respiratory secretions are mostly paucibacillary, leading to limited sensitivity of available diagnostic tests. Although molecular tests are becoming increasingly available globally, mycobacterial culture remains the gold standard for diagnosis and determination of drug susceptibility and is more sensitive than molecular methods for paucibacillary TB. ObjectiveWe evaluated stool culture as an alternative to respiratory specimens for the diagnosis of suspected intrathoracic TB.MethodsChildren <13 years of age who presented with suspected intrathoracic TB were enrolled from 2 local hospitals in Cape Town, South Africa. Culture of one stool specimen was compared to Xpert and culture of up to 4 respiratory specimens. Stool specimens were homogenised with phosphate buffered saline. Decontamination/digestion with NALC/NaOH 1.25% was completed for stool and respiratory specimens, followed by concentrated fluorescent smear microscopy, Xpert MTB/RIF and liquid culture. International consensus case definitions were used to classify participants' certainty of TB diagnosis.Results188 children were enrolled (median age 14.4 months; 15.4% HIV-infected). Cultures were contaminated in 78/188 (41.5%) stool specimens. Of the 110 children with evaluable results, stool culture detected 7/38 (18.4%) children with confirmed TB, and 7/90 (7.8%) children initiating TB treatment. The sensitivity and specificity of stool culture vs. culture and Xpert of 4 respiratory specimens were 28.6% (95% CI 11.3-52.2%) and 98.9% (95% CI 93.9-100.0), respectively.ConclusionStool culture cannot be recommended for the diagnosis of intrathoracic TB in children until laboratory protocols are developed to reduce contamination and thereby enable more reliable estimates of its true diagnostic value.

Posters/ Plakkate

ABSTRACT NUMBER / ABSTRAKNOMMER: 15

A 10 year retrospective review of Listeria Monocytogenes infection at Tygerberg Children's Hospital: Is empiric Ampicillin still indicated past the early neonatal period?

Kim Oppel (Stellenbosch University - Department of Pediatrics and Child Health)

Background:Ampicillin is added empirically to the treatment of suspected sepsis or meningitis in infants < 3 months of age to cover Listeria Monocytogenes (LM). In view of the limited LM cases seen in other countries, the limited South African data available and the recent Ampicillin shortage at Tygerberg Hospital (TBH), we aimed to describe the positive cultures of LM at TBH to rationalize our Ampicillin usage.Methods:This was a retrospective descriptive study of all patients with a blood or

cerebral spinal fluid (CSF) culture yielding LM processed at the TBH laboratory, including Eastern Metro, Winelands and Overberg over the 10 year period 01/01/2006–31/12/2016. All positive cultures of children <13 years of age were included in the analysis.Results:There was a total of 26 positive cultures for LM and 23/26(88%) <3 month of age, all of which were < 1month old.13/23(56.5%) infants were born at or referred to TBH for management. 6/13 (46%) presented on the day of delivery. 12/13 (92%) were admitted to the neonatal intensive care unit (NICU) and 8/13 (62%) died. Babies born and managed at our referral hospitals were more likely to have CSF taken ((90% vs 31% (p=0.019)), a higher platelet count (239x10^9/L vs 107x10^9/L (p=0.004)), lower CRP (64mg/ml vs 137mg/ml(p=0.01)) and a lower mortality rate (0% vs 62% (p=0.002) than infants managed at TBH. The calculated incidence of LM at TBH was 0.04/1000 live births, and 2.3/1000 NICU admissions.Conclusion:In concordance with other countries, incidence of neonatal LM infection at TBH is low. However infants present with severe disease and a high mortality rate. Given that no cases of neonatal LM presented >10 days of age, it would be safe to limit empiric Ampicillin prescription to infants <1 month old. This is in keeping with international guidelines from developed countries

ABSTRACT NUMBER / ABSTRAKNOMMER: 16

A Description of the Language Facilitating Strategies used by Early Childhood Educators of three to five-year-old children in the Cape Winelands District

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The preschool years are the crucial period for optimal language development. Early Childhood Educators play a vital role in promoting interaction and language skills in the classroom. This study described the Language Facilitating Strategies used by 13 educators in two (2) different contexts (circle time and table-top activity). A mixed method design was used. The TILRS (Giromaletto, Weitzman and Greenberg, 2000) was used to score the educators. Outcome measures focused on the three sub-areas of the TILRS. More strategies were used during circle time compared to table-top activities. The ECE used a Variety of Labels most frequently, however, rarely implemented the Join In and Play strategy. Overall, LFS are not used regularly enough. Further research studies should focus on incorporating an additional context that would provide more opportunities for Child-Centred strategies. Implications for possible educator training in a South African context are discussed.

ABSTRACT NUMBER / ABSTRAKNOMMER: 17

A Follow-up Study of the Epidemiology of Fetal Alcohol Spectrum Disorders in a Community in South Africa

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Background: This community in the Western Cape was first involved in epidemiology research on fetal alcohol spectrum disorders (FASD) in 1997. The rates of FASD have consistently been among the highest of any general population in the world. This study adds current data on the status of FASD in this community. Methods: Presented will be detailed case control findings from a community-wide, in-school study of all consented first grade-learners enrolled in 2010 and their mothers. Dysmorphology examinations were provided and final diagnoses were made after a case conference using revised U.S. Institute of Medicine criteria. Children entered the final diagnostic assessment of the study via random selection and/or growth deficiency. All participants were assessed on five cognitive and behavioral measures, and their mothers were interviewed about alcohol use, childbearing history, socioeconomic and health status, and demographic traits.Results: The consented children were well-delineated and categorized by the specific IOM diagnostic categories on both physical traits and cognitive / behavioral measures. Mothers of children with FASD were significantly more likely to report drinking before, during, and after the index pregnancy, binge drinking of 3 or more or 5 or more drinks per occasion. While controlling for socioeconomic status, the number of drinks per drinking day and drinks per week correlated most highly with head

circumference and total dysmorphology score. Cognitive and behavioral measures were less correlated with drinking. Mothers of children with FASD were significantly older; smaller in height, weight, Body Mass Index, and head circumference; higher parity; and lower in educational attainment and income.Conclusion: The prevalence of FASD remains high in this community. The rate of FAS in the 2010 cohort was 59 – 79 per 1,000 children and total FASD was 170 – 233 per 1,000 or 17% to 23%.

ABSTRACT NUMBER / ABSTRAKNOMMER: 18

A scoping review of the factors influencing augmentative and alternative communication system implementation in the paediatric population with complex communication needs.

Nicole Scheepers & Andrea Visser (Stellenbosch University - Speech-Language and Hearing Therapy)

Children with developmental disabilities often experience severe communication restrictions due to the physical, cognitive, sensory and specific speech and language delays and impairments associated with the condition. In turn communication restriction may not only lead to social isolation, but negatively impacts the very identity of the individual as communicator (Beukelman & Mirenda, 2013). The complex communication needs (CCN) of children can be met through the use of augmentative and alternative communication (AAC) (Beukelman & Mirenda, 2013). However, the reality in South Africa is that children who need this intervention most all too often cannot secure it. Clinicians may have some assumptions or ideas about the reasons for this, but often lack hard evidence about potential barriers and facilitators to AAC implementation. (Baxter, Enderby, Evans & Judge, 2012). This study, therefore, aimed to review published literature investigating the potential barriers and facilitators to AAC implementation.In order to achieve the aims of the study a scoping review was deemed the most appropriate methodology because it allowed for the identification, selection, synthesis and analysis of the most important published information, while also assisting in the identification of gaps in literature which could direct future research on this topic. Steps set out by Arksey and O'Malley (2005) were followed to perform the review.The final results of the study will be available by July 2017. The results will include documented barriers and facilitators to the implementation of AAC. In the process the researchers hope to contribute to the knowledge base of professionals working in the field of AAC in SA by using the results to guide and inform best practice, and to use the results of the study to identify future research into the specific factors (barriers and facilitators) influencing AAC implementation, thereby supporting evidence-based practice in the field of AAC intervention.

ABSTRACT NUMBER / ABSTRAKNOMMER: 19

Abstinence period: Impact on seminal citric acid and sperm motility

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Variations in the ejaculatory abstinence durations suggested by different guidance bodies have resulted in debate over what the idea abstinence for an optimal semen sample should be. Various studies have sought to determine the typical versus optimal time after which human semen samples should be collected for standardized analysis as well as use in assisted reproductive techniques (ART), whilst the results are often contradictory. Citric acid is primarily produced and secreted by the prostate. Decreased citric acid levels are present in patients with prostatitis and azoospermia, yet no studies have attempted to elucidate how it is affected by abstinence and its impact on sperm function.Semen samples were obtained from 16 normospermic men according to the WHO guidelines after long (≈ 4 days) and short (≈ 4 hours) periods of ejaculatory abstinence. A standard semen analysis was performed and sperm motility was analyzed using Computer Aided Sperm Analysis (CASA). The seminal plasma was isolated by centrifugation and the citric acid concentration was measured using a commercially available Citric Acid Assay Kit. A significant increase in both total and

progressive motility was observed between long and short abstinence as well as a significant decrease in the citric acid concentration. A significant negative correlation was found between pH and citric acid as well as motility and citric acid ($p \leq 0.05$).These findings show that abstinence length affects prostatic secretions such as citric acid, thereby manipulating the seminal environment through altering pH which is known to have an effect on motility. It can be concluded that shorter abstinence periods significantly improve sperm quality. Further studies on the exact mechanisms through which shorter abstinence and the effect on accessory sex gland secretion influences sperm function post-ejaculation should be conducted. This could possibly be a pivotal cost-effective non-invasive method for increasing ART success rates.

ABSTRACT NUMBER / ABSTRAKNOMMER: 20

All the little things she does – the range of care roles of women in the families affected by HIV in 9 HPTN 071 (PopART) study communities in the Western Cape, South Africa

Lario Viljoen (Desmond Tutu TB Centre)

Background: In South Africa, women, particularly older matriarchs, are often primary caregivers for extended families. Many women take on multiple roles including household head, primary income earner and recipients of grants (including childcare, pension, disability or other). In households affected by HIV, additional physical, emotional, and material support is needed. We ask, what are the costs of women's care-roles over time in households affected by HIV?Methods: HPTN 071 (PopART) is a community randomized HIV prevention trial conducted in 9 communities in South Africa. Part of the social science evaluation is a qualitative cohort of 48 families affected by HIV. Data are collected for 18-24 months using ethnographic and participatory research methodologies, including iterative 'kinship-mapping' of family members, their relationships and roles. We present a descriptive analysis of different care roles women play and the costs associated. Results: In households affected by HIV, we identified three types of care-roles of women: firstly, health mediators, offering encouragement and negotiating health-seeking behaviour – e.g. 'Doris', who rewards her adult son monetarily if he is adherent, at her own financial expense; secondly, moral custodians, responsible for the family's health compliance and integrity– e.g., 'Nomsa', who confronted her son to take responsibility for transmitting to his girlfriend, causing emotional distress for 'Nomsa'; lastly, guardians, protecting HIV-affected family from social harm – e.g., 'Dumisa' who speaks out against anyone mistreating her HIV-positive son, risking potential social repudiation. The care-role assumed by women is responsive to context and changing household health conditions across time. As a result, women can occupy one or all of these care-roles.Conclusion: Since the start of the epidemic, women have been central in providing extended care for HIV-affected household members. The data highlight the need for improving support to women as familial caregivers.

ABSTRACT NUMBER / ABSTRAKNOMMER: 21

Biobanking lessons learned from an urine based preeclampsia study

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Cold chain management (CCM) is important for biospecimen integrity and quality within the biobank. Urine is an excellent biospecimen to biobank as it has metabolites that are easy to test. Pre-eclampsia (PE) is a complication during pregnancy that affects both the mother and fetus. Early identification of PE would decrease the likelihood of maternal and perinatal mortality and improve antenatal care, management and treatment, thus identification of potential biomarkers are of importance in the area of PE. Urine has the potential to help predict PE as proteinuria can be detected in the urine and be quantified. The Calcium and Pre-eclampsia (CAP) study: a WHO collaboration that forms part of the Pre-eclampsia and eclampsia monitoring, prevention and treatment (PRE-EMPT) consortium has been

collecting urine biospecimens in Argentina, Zimbabwe and South Africa. These biospecimens were collected and then frozen at -80 degrees since 2013. In 2017, the urine biospecimens were requested to be moved to a central Biobank (NSB) in Cape Town. The aim of the biobank was to relabel, reorganise and re-check against the database that was compiled, as each site had their own guidelines for sample collection and data compilation. A number of issues were observed for the collections of which labelling and overfilled tubes were major concerns. In order to standardize and harmonize procedures, urine biospecimens were relabelled with both 1D and 2D unique barcode, reorganised and rechecked. This resulted in improved ease of access and search of biospecimens via a laboratory information management system (LIMS). In conclusion urine biospecimens have the potential to be a diagnostic tool in the prediction of preeclampsia. Access to good quality biospecimens are of importance in biomarker identification studies. Harmonisation of biobanking procedures for the CAP study resulted in an excellent cohort that would be of benefit to the wider research pre-eclampsia community.

ABSTRACT NUMBER / ABSTRAKNOMMER: 22

Biophysical properties of experimental compositions of a synthetic pulmonary surfactant Synsurf® for aerosolisation.

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Purpose: Synthetic pulmonary surfactant generally consists of phospholipid mixtures, free fatty acids and/or sterols, as well as specific protein constructs that mimic the function of SP-B or SP-C. Ideal formulations of synthetic pulmonary surfactants, intended for aerosolisation, requires formulations to be defined with regards to optimal particles size generation and ultimate conservation of surface tension properties during the process of nebulisation. The objective of the study was, therefore, to evaluate the suitability of different formulations of a new peptide-containing synthetic surfactant Synsurf® during aerosolisation. Methods: Synsurf® was prepared with additions: palmitic acid, cholesterol and tripalmitin followed by extrusion via a polycarbonate membrane. Synsurf®, Curosurf® and Liposurf® were aerosolised with the use of Aeroneb®Pro nebuliser and particles were collected in a pooling container. Particles within nebulised and un-nebulised surfactant preparations were compared by determining particle sizes with the use of a Zeta-Sizer. Surface tension was quantified with the use of a Drop Shape Analyser (DSA25) and density of each sample, an essential parameter, was measured with the use of a pycnometer. Results and Conclusions: Particle generated from all preparations fell below the recommended range for inhaled particles however extruded Synsurf® samples showed the formation of larger particles within the desired range (1µm – 3µm). Physiochemical conditioning of Synsurf® via extrusion could be a crucial step for nebulisation preparations, thus aiding in optimal distribution within the distal areas of the lung. Synsurf® showed no significant changes in surface-tension lowering ability before and after nebulisation. Synsurf® samples with the addition of tripalmitin/palmitic acid and low concentrations of cholesterol demonstrated a rapid decrease in surface tension before and after nebulisation, comparable to results obtained from Liposurf®, thus indicating equivalency between preparations at a phospholipid concentration of [20 mg/mL].

ABSTRACT NUMBER / ABSTRAKNOMMER: 23

DIABETES MELLITUS INDUCTION: EFFECT OF DIFFERENT STZ DOSES ON MALE REPRODUCTIVE PARAMETERS

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Diabetes mellitus (DM) is reported to be involved in male reproductive impairment, and its impact is evident in the increased prevalence of infertility. Various studies have reported that a single

parenteral injection of <40mg/kg Streptozotocin (STZ) is ineffective in ablating pancreatic β-cells and creating a rat model to investigate the effect of DM on the male reproductive system. This study therefore aims to validate these claims.Adult male Wistar rats received a single intraperitoneal injection of STZ (30mg/kg or 60mg/kg) or saline (0.9%, Control). Diabetes was confirmed after 72hours if plasma glucose levels were ≥14mmol/L. Body weight, glucose level, food and fluid intake were measured weekly. Animals were sacrificed after 8 weeks of treatment by an overdose of sodium pentobarbital (160mg/kg body weight). The testis and epididymis were harvested and weighed prior to preparation for histological evaluation. Epididymal sperm morphology was analysed using computer aided sperm analysis (CASA). STZ60 animals presented with significantly lower body weights compared to both control and STZ30 groups. Animals in both STZ30 and STZ60 groups showed decreased normal sperm morphology compared to control. Histological evaluation of the testes showed a decrease in the number of spermatozoa in the seminiferous tubules of animals in STZ30 and STZ60 compared to control. A complete absence of spermatocytogenesis was observed in the seminiferous tubules of STZ60 animals. These findings proof that STZ concentration of 30mg/kg, which is much lower than the reported 40mg/kg, has adverse effects on the male reproductive system and can be used to study the impact of DM on male fertility.

ABSTRACT NUMBER / ABSTRAKNOMMER: 24

Early experiences of the acceptability and palatability of a novel child-friendly levofloxacin formulation in young children

Susan Purchase (Stellenbosch University - Desmond Tutu TB Centre)

"Background: The lack of child-friendly formulations of anti-tuberculosis (TB) medications is a major barrier to clinical care and research for the prevention and treatment of TB in children. We evaluated the acceptability and palatability of a novel scored, dispersible, taste-masked levofloxacin 100 mg formulation in children 0-5 years of age. Methods: Levofloxacin 100 mg tablets (Macleods Pharma, Mumbai, India) were administered to child household contacts 0-5 years of adults with drug-resistant TB, enrolled in a pharmacokinetic lead-in to a MDR-TB prevention trial (TB CHAMP). Levofloxacin (15-20 mg/kg) was given once-daily for 7-14 days. A validated palatability tool was administered to caregivers of children by clinical staff. We also conducted in situ observations, and semi-structured interviews with caregivers. We report on palatability scores and caregiver experiences. Results: Fifteen children, 8/15 (53%) girls, median age 23 (3 -54) months, all HIV-uninfected, were enrolled. 8/15 (53%) caregivers felt that their children liked/really liked the taste of the tablets. 14/15 (93%) caregivers indicated that the preparation of doses was easy/very easy and all said the tablet dissolved easily. 11/15 (73%) caregivers were happy with the total reconstituted drug administration volume. 9/13 (67%) of caregivers whose children were previously taking prophylaxis felt that preparation of the levofloxacin paediatric formulation was easier/much easier compared to their standard-of-care regimen including adult levofloxacin (250mg) tablets, while 11/13 (85%) felt the taste was equivalent/better/much better. During in-depth interviews, participant caregivers reported that paediatric formulation was preferable to adult formulations due to of ease of administration and improved palatability. Prior experiences of TB formulations strongly influenced initial caregiver and child responses to the novel levofloxacin formulation.Conclusions: We report good acceptability and palatability in young children receiving a novel paediatric levofloxacin formulation. More child-friendly formulations may help children adhere better to TB preventive therapy and treatment in future. "

ABSTRACT NUMBER / ABSTRAKNOMMER: 25

Excellent treatment outcomes in children treated for tuberculosis under routine operational conditions in Cape Town

Muhammad Osman (Stellenbosch University - Paediatrics and Child Health)

BACKGROUNDTuberculosis (TB) remains a leading cause of death in children globally. While recognised that HIV infection increases the risk of developing TB, our understanding of the impact of

HIV on risk of mortality for children treated for TB is limited.OBJECTIVEWe aimed to identify predictors of mortality in children treated for drug-susceptible TB.METHODS A retrospective analysis of all children (<15 years) notified and treated between 2005 and 2012 for drug-susceptible TB in Cape Town was conducted. Survival analysis using cox regression was used to estimate hazard ratios for death. Logistic regression was used to estimate the odds of unfavourable outcomes. RESULTS Of 29,519 children recorded with TB over the study period, <1% died during TB treatment and 89.5% were cured or completed treatment. The proportion of children with known HIV status increased from 13% in 2005 to 95% in 2012. Children under 2 years had an increased hazard of death (aHR: 3.13; 95%CI: 1.78-5.52) and greater odds of unfavourable outcome (aOR: 1.44; 95%CI: 1.24-1.66) compared to children 10-15 years. HIV-positive children had increased mortality compared to HIV-negative children (aHR: 6.85; 95%CI: 4.60-10.19) and increased odds of unfavourable outcome (aOR: 2.01; 95%CI: 1.81-2.23). Later year of TB treatment was a protective predictor for both mortality and unfavourable outcome.CONCLUSIONWe demonstrate a dramatic improvement in HIV testing in children with TB over time and excellent overall treatment outcomes. HIV infection and young age were associated with increased risk of death and unfavourable outcome.

ABSTRACT NUMBER / ABSTRAKNOMMER: 26

Identifying key concepts in interventions aimed at improving motor skills in pre-school children – a scoping review

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Background: Motor skill difficulties under South African children influence their academic progress in the foundation learning fase. These difficulties should be addressed at a pre-school level through a holistic intervention, unique to the specific sosio-economic and cultural diversity in South Africa. This scoping review aim to explore the literature to create a well laid out "map" to follow with regards to key concepts involved in motor skill interventions for pre-school children and is the first stage of a comprehensive PhD project. Aim: To identify the key concepts of positive interventions used for different groups of pre-school aged children to improve motor proficiency. Method: Records identified through searches on databases were screened according to inclusion/exclusion criteria, leading to the final 36 articles included in the analysis. Data was charted on excel worksheets under relevant headings and numeric coding was used to categorise information. Key concepts of the studies were organised into common themes and best practice principles.Practice Implications: Occupational therapy interventions were included in most studies. Various approaches and techniques were used with positive effect. This scoping review identified the key concepts and best practice principles used to guide the development of a unique new occupational therapy-led program for children attending state schools in a predominantly rural area in South Africa.Conclusion: Existing literature is important in guiding the development of occupational therapy interventions. Nevertheless, further consultation and research is required to ensure that new interventions are also context-specific.

ABSTRACT NUMBER / ABSTRAKNOMMER: 27

Investigating in vitro effects of aqueous root extract of mondia whitei in human sperm functionality of oligoasthenozoospermic patients

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Medicinal plant knowledge tends to lie in the hands traditional healers. However, this knowledge has been altered with modernization. In addition, land degradation and deforestation have resulted to the reduction of medicinal plants of which Mondia whitei (White Ginger) is not an exception.Traditionally, M. whitei root extracts are highly appraised in treatment of male infertility in folklore medicine. So far, no studies have been performed to investigate the effect of the root extract in oligoastenozoospermic patients. Hence, the aim of this study was to investigate the effect of aqueous root extract of M.

whitei in oligozoospermic (concentration < 15 million/ml) patients in vitro. A total of 60 semen samples were collected: healthy sperm donors (n=28) and infertile patients (n=34). Furthermore, oligoasthenozoospermic semen samples were identified and analysed separately. Sperm were washed using HTF-BSA and incubated for 1 hour at 37˚C with different concentration of M. whitei (0.0185, 0.185, 1.85, 18.5 and 185 µg/ml). A sample without M. whitei served as control. Sperm cell motility, vitality, reactive oxygen species (ROS) production, mitochondrial membrane potential (MMP), capacitation, acrosome reaction and DNA fragmentation were assessed. Results revealed that there was a significant dose-dependent increase in the percentage of total motile spermatozoa, MMP-intact spermatozoa, a positive trend on ROS-positive spermatozoa and a negative trend in the percentage of DNA-fragmented spermatozoa in the patient group. Similarly, there was a significant dose-dependent increase in the percentage of MMP-intact spermatozoa and a positive trend in the percentage of ROS-positive spermatozoa in the normozoospermic group. There was no effect on other sperm functional parameters. In conclusion, M. whitei increases the percentage of total motile sperm, but does not induce the production of intrinsic superoxide that leads to DNA fragmentation hence, the MMP of these cells is maintained.

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Is adrenal suppression in asthmatic children reversible?

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Background: Six hypocortisolaemic asthmatic children on steroids given at physiological doses were identified during a previous study.Objective: To establish whether hypothalamic-pituitary-adrenal axis suppression (HPAS) could be reversed in hypocortisolaemic asthmatic children treated with steroids without sacrificing asthma control.Methods: On diagnosis 6 hypocortisolaemic asthmatic children were started on hydrocortisone (HC). Asthma treatment was modified by introducing steroid sparing medications. Serum cortisol and repeat overnight metyrapone tests (ONMTPTs) were done until HPAS had recovered in all patients. A retrospective folder review was performed and the following extracted: BMI standard deviation score (SDS), asthma score, FEV1, adherence, daily steroid type & dose, treatment modification, serum cortisol, final ONMTPT and time taken until normalization.Results: Median serum cortisol recovered from 50 to 311 nmol/l after 0.4-2.2 (median 0.9) years. The ONMTPT had normalized by 1.7-7.1 (median 3.3) years. Steroid load decreased from 9.2 to 5.0 HC equivalent mg/m2/day (medians), while asthma score improved from 1.42 to 0.85 (medians). Number of prednisone courses decreased from 0-7 (median 5) to 3. FEV1, before and after intervention was 79 and 82 % (medians) respectively. The median BMI SDS decreased from -0.08 to -0.16. Poor adherence to therapy was noted in 4 children, affecting modification and time to recovery of the HPA. Inhaled corticosteroid dose could be reduced in all but one who was not adhering to therapy. Nasal steroids were discontinued in one, reduced in another, but as a group their dosage increased. Steroid sparing medication included salmeterol, fometerol, montelukast and long acting theophyllines.Conclusions: Hypocortisolaemia developed while asthmatic children were treated with physiological doses of steroids. On reducing steroid load by 40% and supplementing therapy with steroid sparing medication, hypocortisolaemia and HPAS were reversed, while asthma control improved. Poor adherence to therapy may have retarded axis recovery, while BMI increase did not affect it.

ABSTRACT NUMBER / ABSTRAKNOMMER: 29

Optimizing paediatric drug-resistant tuberculosis treatment: population pharmacokinetics of moxifloxacin and linezolid in children

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Background: Optimal paediatric doses of the key second-line antituberculosis drugs moxifloxacin (MFX) and linezolid (LZD) are unknown, but are needed to inform current guidelines, planned trials and timely access to new regimens for children with multidrug-resistant (MDR) tuberculosis (TB).Methods: Two observational cohort studies in Cape Town, collected pharmacokinetic (PK) data in HIV-infected and –uninfected children aged 0-18 years routinely treated for MDR-TB with either MFX (10mg/kg once daily) or LZD (10 mg/kg/dose twice daily in children <10y, once daily in children >10y). Plasma samples were drawn pre-dose, and then either 1, 2, 4, 6 and 8 hours or 1, 4 and 10 hours post-dose. Data was analyzed using non-linear mixed-effects modeling.Results: Fifty-two children were included in the MFX analysis, median age 8.4 years (IQ 3.0-12.1); 7 (14%) were HIV-infected. Allometric scaling on clearance (CL) and volume (Vd) improved the model fit; HIV-infection and low HAZ were associated with increased CL. The median MFX AUC of 40.4 µg*h/mL in children >10 y approximated adult target values after a 400 mg dose (38.7 µg*h/mL), but exposures in younger children were much lower, with a median AUC of 18.9 µg*h/mL in children aged <2 years. Seventeen children contributed to the LZD analysis, median age 4.8 years (IQR 2.2-10.0); 1 (6%) was HIV-infected. Allometric scaling on CL and Vd improved model fit. Overall drug exposures approximated targets well, with a median (2.5, 97.5%) AUC of 97.7 µg*h/mL (60.3-294) compared to adults with TB receiving a 600 mg dose (median AUC 96.8 µg*h/mL, range 47.8-143.7); a substantial proportion of children exceeded adult targets.Conclusions: With currently recommended doses, MFZ exposures were low in young children but LZD exposures met or exceeded adult target values. Optimal doses based on these PK models may improve current and future MDR-TB treatment regimens in children.

ABSTRACT NUMBER / ABSTRAKNOMMER: 30

PHARMACOKINETICS AND DRUG-DRUG INTERACTIONS OF LOPINAVIR/RITONAVIR ADMINISTERED WITH FIRST AND SECOND-LINE ANTITUBERCULOSIS DRUGS IN HIV-INFECTED CHILDREN TREATED FOR MULTIDRUG-RESISTANT TUBERCULOSIS

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BackgroundLopinavir/ritonavir forms the backbone of the current first-line antiretroviral regimens in young HIV-infected children. As multidrug-resistant (MDR) tuberculosis (TB) frequently occurs in young children in high-burden TB settings, it is important to identify potential interactions between MDR-TB treatment and lopinavir/ritonavir. Our aim was to describe the pharmacokinetics of and potential drug-drug interactions between lopinavir/ritonavir and existing routine drugs used for the treatment of MDR-TB in HIV-infected children.Methods A combined population pharmacokinetic model was developed to jointly describe the pharmacokinetics of lopinavir and ritonavir in 32 HIV-infected children (16 on MDR-TB treatment with combinations of high-dose isoniazid, pyrazinamide, ethambutol, ethionamide, terizidone, a fluoroquinolone and amikacin, and 16 controls without TB), who were established on a lopinavir/ritonavir-containing antiretroviral regimen. ResultsOne-compartment models with first-order absorption and elimination for both lopinavir and ritonavir, were combined into an integrated model. The dynamic inhibitory effect of ritonavir concentration on lopinavir CL was described using an Imax model. Even after adjusting for the effect of body weight with allometric scaling, large variability in exposure was detected, together with strong correlations between the pharmacokinetic parameters of lopinavir and ritonavir. We could not detect a significant effect of MDR-TB treatment on the bioavailability, clearance, or absorption rate constants of lopinavir or ritonavir. Most children (81% of MDR-TB disease; and 88% non-TB HIV-infected controls) achieved therapeutic lopinavir trough concentrations (>1 mg/L).ConclusionsNo significant effect was found on key pharmacokinetic parameters of lopinavir or ritonavir when co-administered with routine MDR-TB drugs in children. These findings should be considered in the context of large inter-patient

variability and the modest sample size. Additional future research is important in this area; especially as novel MDR-TB drugs are introduced in children.

ABSTRACT NUMBER / ABSTRAKNOMMER: 31

The detection of respiratory viruses in South African children with suspected pulmonary tuberculosis

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Background:Tuberculosis (TB) and acute pneumonia are important causes of morbidity and mortality in children globally. Although the importance of viral and bacterial infections in the aetiology of respiratory illness is well-established, key questions regarding the prevalence of specific pathogens and the association between viruses and TB, remain unanswered.Methods:Analyses were nested in a prospective hospital-based cohort study in children aged 0-14 years, routinely investigated for suspected pulmonary TB (PTB) in Cape Town, South Africa. At enrolment investigations included collecting at least 3 respiratory samples for smear microscopy, GeneXpert TB and liquid culture. Nasopharyngeal aspirates were collected for viral respiratory investigation using a commercially available multiplex PCR (Anyplex™ II, RV16, Seegene) including 16 viruses of clinical and epidemiological relevance. Children started on TB treatment were classified as cases while other children were classified as symptomatic controls.Results:A total of 73 children were enrolled, median age 22 months (IQR 10-48); 41/73 (56.2%) male and 13/73 (18.6%) HIV-infected. 42/73 (57.5%) initiated TB treatment; 19/42 (45.2%) were bacteriologically confirmed. In 70/73 (95.9%) children 1 or more viruses were detected: 39/42 (92.9%) were cases and 31/31 (100%) controls. Human Rhinovirus (HRV), the most prevalent virus, was detected in 53/73 (72.6%) children:35/42 (83.3%) cases and 18/31 (58.1%) controls, this difference was significant (OR 3.61, 95% CI 1.23-10.64, p= 0.02). Adenovirus was the second most prevalent virus, detected in 41/73 (56.2%) children; 24/42 (57.1%) cases and 17/31 (54.8%) controls.Conclusion:Respiratory viruses were frequently detected in children with suspected PTB in South Africa. HRV and adenovirus were the most common viruses, with HRV being detected more frequently in children diagnosed with TB, suggesting that HRV infections may unmask underlying airway disease due to TB. More studies are needed to understand the role of respiratory viruses in children with suspected PTB.

ABSTRACT NUMBER / ABSTRAKNOMMER: 32

The effects of low to moderate and binge drinking on the neurocognitive outcomes, behaviour profiles and IQ in 4 year old children

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BACKGROUND:Prenatal alcohol use is common and is a significant public health concern. Although a decrease in intellectual ability, cognitive effects, behaviour changes and decreased growth have been associated with heavy prenatal alcohol exposure, there has been fewer studies on the effects of lower levels of exposure. There is a particular paucity of data on preschool children and most studies are limited by the retrospective nature of the collection of data on prenatal alcohol exposure.OBJECTIVE: To examine the effects of low to moderate and heavy prenatal alcohol consumption on neurocognitive function, behaviour profiles and IQ in 4 year old children.DESIGN: Cohort follow up study of 500 children from the Safe Passage Study.METHODS: Participants were contacted when their child was 4 years of age. Anthropometrical information was collected, the Kaufman Assessment

Battery for children (KABC-II) was performed as a standardised measure of intellectual ability, the NEPSY-II neuropsychological instrument was performed to assess neurocognitive performance and the caregiver completed the Preschool Child Behaviour checklist (CBCL/1 ½ -5) by Achenbach to rate the child's problem behaviours and competencies. Once the assessments were completed the prenatal alcohol exposure, which was collected during pregnancy, was correlated to the results.RESULTS: Low to moderate prenatal alcohol exposure: There were no statistically significant differences in the NEPSY II, Achenbach and CBCL.Heavy prenatal alcohol exposure: There were trends to higher behavioural problems in the CBL, there were trends to lower IQ scores in heavy exposure with statistically significant differences for the Simultaneous sub-test (Current effect: F(3,455)=3 0297, p=0,03 Krusckal-Wallis p=0,04) and trends to lower scores in the NEPSY sub-tests for language, sensorimotor and visual-spatial abilities.CONCLUSIONS: This study showed no significant effects of low to moderate prenatal alcohol consumption on IQ, neurocognitive performance and behaviour of 4 year old children.

ABSTRACT NUMBER / ABSTRAKNOMMER: 33

THE NEED FOR DEDICATED PAEDIATRIC RHEUMATOLOGY SERVICES: RETROSPECTIVE REVIEW OF A CLINIC SERVICE AT TYGERBERG HOSPITAL, CAPETOWN, WESTERN CAPE.

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Introduction: Paediatric Rheumatology in South Africa competes with limited health care resources allocated to epidemic diseases. Data on prevalence, incidence, disease categories, delay in diagnosis and management are crucial. Available literature is limited in sub-Saharan Africa. Objectives: The primary aim is to document demography, disease profile and medical management of patients attending the Tygerberg Paediatric Rheumatology clinic. The secondary aim will address the need of specialized services and subspecialty training posts. Methods: Retrospective folder review, electronic data search and use of bivariate and multivariate statistical tools used for analysis to outline the disease profiles.Results: 450 patients were reviewed between 1995 and 2017.Referrals were from secondary and tertiary hospitals (68%), general and private practitioners (13%) and 8.2% by primary healthcare centers. 60% of referred patients resided in the greater Cape Town region and 40% in rural-country regions. Most of the patients (74%) were from a family income bracket of less than 7700 USD per year.Gender distribution reflected 56% female and 44% male. Common age of presentation was between 10-14 years (46%) Racial distribution was Mixed Racial 79%, Blacks 16%, Whites 4% and Asians 1%. JIA (38%) was most common rheumatological condition. Reactive Arthritis (23%), autoimmune/ autoinflammatory conditions (11%), vasculitides (2%) and miscellaneous musculoskeletal conditions (39%.) Common presenting symptoms were tender joints (71%), stiffness after rest (46%) and swollen joints (44%). Delay in diagnosis was up to 9 years. Most frequently used DMARD's were methotrexate and hydroxychloroquine. Biological therapy was accessed by selected patients.Conclusion: Patients reviewed were mainly of mixed racial origin from low-income homes. JIA was the most common. Delay in diagnosis and late referrals were frequent. Increased awareness, education and training, early diagnosis of disease and appropriate funding could dramatically improve outcome. Addressing challenges unique to a developing country are essential for advocacy and planning of such services.

ABSTRACT NUMBER / ABSTRAKNOMMER: 34

The pharmacokinetics of high dose Isoniazid for the prevention or treatment of drug-resistant tuberculosis in HIV-infected and -uninfected children

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BackgroundCurrent treatment options for paediatric multidrug-resistant (MDR) tuberculosis (TB) are limited. Higher dose isoniazid (INH) could be used to overcome low-grade INH resistance, however

pharmacokinetic (PK) data to inform paediatric dosing is needed, which we aimed to characterize.Methods This prospective observational pharmacokinetic study was conducted in Cape Town, South Africa, including HIV-infected and -uninfected children routinely receiving high-dose INH for the prevention or treatment of MDR-TB. PK sampling was performed after an exact 20mg/kg dose of INH (maximum 400mg). Non-compartmental analysis was performed and multivariable regression models were generated to determine associations of key covariates with AUC(0-∞) and Cmax and also compare to proposed targets.Results Seventy-seven children were included (median age 3.7 years). Of the children <5 years (n=58), 32 received high-dose INH for MDR-TB disease and 26 for MDR-TB exposure. All children >5years (n=19), had MDR-TB disease. Overall, the median (IQR) AUC0-∞ was 17.9 µg*h/mL (9.9-48.6) and Cmax was 5.14 µg*h/mL (2.69-12.2). In multivariable analysis in children <5 years old, MDR-TB disease (vs MDR-TB exposure) [GMR=0.19 (95 % CI 0.15-0.26), p<0.001] was associated with both 〖AUC〗_(0-∞) and Cmax. [0.20 (0.15-0.26), p< 0.001. In children with MDR-TB disease, the median (IQR) 〖AUC〗_(0-8) of 9.9 µg*h/mL (6.3-14.3) and Cmax of 3.4 µg/mL (2.0-5.1) were well below those in the MDR-TB exposure group [〖AUC〗_(0-8) 67.5 µg*h/mL (43.2-102.7), Cmax 16.0 µg/mL (12.9-20.5) and also well below previously reported values in children receiving standard dose INH. INH exposures in our study were below proposed targets for the majority of isolates with low and intermediate level resistance.ConclusionIsoniazid concentrations in children with MDR-TB disease receiving high-dose INH were much lower than expected, however those in the MDR-TB exposure groups were comparable to previous reports. Further studies are needed to confirm these findings and explore possible causes including previously undescribed drug-drug interactions.

ABSTRACT NUMBER / ABSTRAKNOMMER: 35

Usefulness of the Goodenough Drawing Test as a screening tool to detect developmental delay in South African pre-school children

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Background: There is a need for simple effective screening tools to detect developmental delay in pre-school children to ensure timeous intervention. The Goodenough test for drawing a person (DAP) is easily administered, requires limited language ability and equipment, and is freely available; thus potentially useful in resource-constrained settings. Objectives: We aimed to determine the diagnostic accuracy of DAP to identify developmental delay in 5-year old pre-school children using the Griffiths Mental Developmental Scales-Extended Revised (GMDS-ER) eye-hand coordination subquotient (DQ) as the gold standard.Methods: Cross-sectional analysis of drawings by South African pre-school children from low-income families whose GMDS-ER assessments included a human figure drawing. DAP quotients were estimated independently by a developmental paediatrician and two medical officers to calculate inter-rater agreement. The paediatrician's scores were used to determine the diagnostic accuracy of the DAP quotient (<85) to predict developmental delay with the DQ (<75) on the GMDS-ER assessments.Results: Of the 125 children included 48.8% were boys with a mean age of 60.8 (range 59-66) months. Median DAP score was 94 (IQR: 85-103) with 28 DAP quotient scores below 85. Applying the DAP cut-off of 85, sensitivity of DAP to DQ was 80% and specificity 89%. Area under the ROC curve was 0.87 (95% CI: 0.78-0.96). Sensitivity and specificity of the DAP were optimal when using the established threshold score of less than 85.6. Conclusions: The Goodenough

DAP is an effective screening tool for detecting delayed fine motor and visual perceptual abilities in preschool South African children.

ABSTRACT NUMBER / ABSTRAKNOMMER: 36

"The Dop System of Alcohol Distribution Is Dead, But It's Legacy Lives On…

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Background: In the Western Cape Province (WCP) of South Africa, many people are involved in growing grapes and wine production. For almost two centuries, farmworkers in the WCP received wine as partial payment in a practice known as the "Dop-system". Public health advocates maintained that Dop still existed in the 1990's and early 2000's. Some believe Dop still exists and directly elevates problem drinking and rates of fetal alcohol spectrum disorders (FASD). Methods: Data from seven population-based samples from FASD prevalence studies in the WCP, is presented. It examines evidence and data on whether the Dop-system still exists, current drinking patterns, and whether the Dop-system influenced the high FASD-rates in the WCP. Results: In a 1999 sample, only 5% of women reported ever receiving Dop (14% mothers of children with FASD, 1% mothers of normal controls). In 2002, 5% of mothers reported having received Dop in their lifetime, 9.5% mothers of children with FASD and 3% mothers of normal controls. Of the mothers of children with a FASD, 1% received Dop during the index pregnancy, and <1% received any Dop in their lifetime. Commercial alcohol sales, access to shebeens and other informal alcohol sales, have replaced the Dop system and are now the major source of alcoholic drinks. This poster will present detail of current drinking patterns in towns and rural areas of the WCP and drinking patterns and rates of FASD varied by socioeconomic and resident status, representing the legacy of historical drinking patterns. Conclusion:The Dop system influenced today's drinking, and even though Dop as a practise is dead, the legacy is still present. Heavy weekend drinking is a major source of social engagement and recreation. Current drinking practices has a substantial impact on problems such as FASD rates.