# *Systematic review: Weight loss interventions for chronic asthma*

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**Background:** Asthma and obesity are both public health problems with increasing prevalence globally. Several epidemiological studies have shown an association between asthma and obesity, however there is no good quality evidence on the effect of weight loss on asthma control.

**Objectives:** To assess the effect of various interventions for weight loss on measures of asthma control and weight loss amongst overweight or obese patients with chronic asthma.

**Search methods:** We searched the Cochrane Airways Group's Specialized Register of Trials (CAGR) (derived from systematic searches of bibliographic databases, including the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library*), MEDLINE, EMBASE, CINAHL, AMED and PsycINFO, and handsearching of respiratory journals and meeting abstracts). We also searched ongoing trials web sites and dissertation databases up to March 2012. We contacted experts in the field and searched reference lists for additional studies.

**Selection criteria:** We included randomized controlled trials (RCTs) of weight loss interventions for overweight or obese participants with asthma compared to either no intervention for weight loss or an alternative weight loss intervention.

**Data collection and analysis:** Two authors independently assessed study eligibility and risk of bias, and extracted data using a data extraction form. We did not undertake any meta-analysis as there were no suitable data to combine.

**Main results:** We included four completed studies conducted amongst adults (n = 197). Two were published as abstracts, and two as full articles. Interventions included supervised physical activity, low calorie diet and anti-obesity drugs (singly or in combination), and were compared to usual care (two studies), low calorie diet (one study), while one study had three intervention arms (physical activity versus low calorie diet versus a combination of the two). Two studies were conducted in high-income countries, while two were conducted in upper, middle-income countries. All studies had an unclear risk of selection and a high risk of detection bias. One of the studies found a statistically significant reduction in symptoms scores in treatment compared to control groups: the difference between groups in total St. George's Respiratory Questionnaire (SGRQ) score was −10 units (95% CI -18 to−1; P = 0.02). One study showed reduction in doses of rescue medication in treatment compared with control groups in the short term. Weight loss was associated with some improvement in forced expiratory volume in 1 second (FEV1) and forced vital capacity (FVC) in one study, which was statistically significant, but clinically unimportant; there was no improvement in peak expiratory flow rate (PEFR). No data were reported on health care utilization and adverse effects. One study reported statistically significant weight loss in the treatment group compared to controls with no intervention, which was still significant at one-year follow-up.

**Authors' conclusions**

**Implications for practice:** This review found one randomized trial that showed that weight loss may be beneficial for improving asthma control in overweight and obese patients, in conjunction with weight loss in intervention groups in the short term. Applying the GRADE system to the results of this review, however, shows that the quality of evidence is low, because although all four studies are RCTs there were serious methodological limitations in the studies (unclear risk of selection bias and high risk of detection bias) and imprecision (small sample size). There is inadequate evidence to comment on the effect of weight loss interventions on quality of life and health care utilization. In addition, there was inadequate reporting of data on adverse effects to permit proper balancing of harms and benefits of the interventions. On account of this low quality of evidence, the benefit of weight loss as an intervention for asthma control remains uncertain, and as such, clinicians should be prepared to help patients to make a decision that is consistent with their own values.

**Implications for research:** The finding that most of the included studies were of low methodological quality highlights the need for further well designed RCTs, with emphasis on adequate methods of allocation sequence generation as well as allocation concealment and longer follow-up periods. These studies need to report more fully on relevant outcomes (both statistically significant and otherwise) such as: asthma symptoms/control, use of rescue medication, change in lung function parameters (actual mean/median values), hospital utilization, quality of life, and adverse effects. There is also a need for longer intervention as well as follow-up durations to evaluate the effect of sustained measures to achieve weight loss, and to determine if these effects are still significantly present after a considerable period of time. There is also a need for these well-designed studies in children and adolescents, as well as in low-income countries such as Africa, where the pre-packaged, low energy diets, as well as structured physical activity-based interventions utilized in these included studies, may not be feasible or applicable.

**Public Citation:**

Adeniyi FB, Young T. Weight loss interventions for chronic asthma. Cochrane Database of Systematic Reviews 2012, Issue 7. Art. No.: CD009339. DOI: 10.1002/14651858.CD009339.pub2