

# Influence of asthma and obesity on respiratory load perception in children

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## Abstract

**Introduction:** Elevated symptom burden has been reported in concomitant asthma and overweight, although objective evidence of greater disease severity is lacking. This may reflect exaggerated symptom perception and has implications for optimal asthma management.

**Aims:** To investigate respiratory load perception in overweight asthmatic (OA) children compared to normal weight asthmatic children (NWA) and healthy controls (HC).

**Methods:** Incremental inspiratory resistive loading was performed in 27 children (9 OA, 9 NWA, 9 HC) with load perception assessed by visual analogue scale (VAS). Respiratory load was quantified via parasternal intercostal electromyography (EMG<sub>para</sub>) expressed as neuroventilatory efficiency (NVE: ratio of tidal volume to EMG<sub>para</sub> (ml/ $\mu$ V)). Linear mixed model analysis was used to examine changes in perception scores and NVE with increasing resistance, and to determine the influence of asthma and overweight.

**Results:** VAS increased significantly with increasing resistance (slope (95% CI) 5.06 (1.83 – 8.29)mm/kPa/L/s,  $p=0.002$ ), which was additionally influenced by degree of reduction in NVE ( $p=0.004$ ). The slopes of these relationships did not differ with group, indicating no effect of asthma or overweight on either perception or objective response to increasing load. Weight had a significant effect on the intercept of the VAS/resistance relationship, with OA having a significantly higher intercept (9.96mm (95% CI 1.15 – 18.77),  $p=0.027$ ), suggesting breathlessness at rest and higher VAS scores throughout.

**Conclusions:** Respiratory load perception is not influenced by weight status. The increased symptom burden in overweight asthmatics may be related to elevated baseline respiratory load.