Abstract Group: 5.2. Monitoring Airway Disease

Keyword 1: Children Keyword 2: Physiology Keyword 3: Respiratory muscle

Title: Parasternal intercostal electromyography in the assessment of preschool wheeze

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Body: Introduction: Assessment of respiratory disease in preschool children relies mainly on physician judgement due to the lack of objective measures in this age group. Assessment of neural respiratory drive (NRD) using respiratory muscle electromyography (EMG) provides a measure of respiratory load and reflects lung disease severity. EMG of the parasternal intercostal muscles (EMGpara), obligate inspiratory muscles, provides a non-invasive, effort-independent measure of NRD which may offer a method for objectively assessing pulmonary function in preschool children. Aim: To measure EMGpara in both healthy and wheezy preschool children, and assess any change following bronchodilator (BD). Methods: EMGpara was measured in 20 preschool children (median (range) age 3.7 (0.7–5.1) years) with physician diagnosed asthma or infant wheeze (AST), and 21 controls (CON) (median (range) age 3.2 (1.2–5.0) years). EMGpara was recorded during tidal breathing using surface electrodes over the 2nd intercostal space. EMGpara was converted to root-mean-square (RMS), and expressed as mean peak RMS EMGpara per breath over the final minute of a 10 minute recording. In AST, the measurement was repeated following 400µg of salbutamol. Results: EMGpara was significantly higher (p=0.0017) in AST preBD than CON (median (range) EMGpara 8.20 (4.15–14.92)µV vs 6.39 (5.57–16.46)µV) and decreased significantly (p=0.0037) postBD (6.98 (4.99–17.06)µV); postBD EMGpara was not different to CON (p=0.18). Conclusion: NRD as assessed by EMGpara is significantly higher in preschool children with asthma/wheeze compared to healthy children and falls following BD. EMGpara may provide a method for assessing respiratory disease in preschool populations.