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Title: Can breathing pattern parameters be differentiated between healthy and severe asthma patients?

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Body: Abnormal breathing patterns during acute episodes of asthma are common. However, little is known about breathing pattern parameters (BPP) in severe asthma (SA) patients during the asymptomatic phase, or how they relate to those in the healthy population. Aim: To determine which BPP differentiate SA patients from healthy controls. Method: Ten SA patients and 10 healthy controls were recruited. BPP were monitored over a 30 minute period by respiratory inductive plethysmography. Recorded BPP were: 1. Tidal volume (Vt); 2. Variability in tidal volume (VVt); 3. Expiration time (Te); 4. Symptoms of hyperventilation (SH); 5. End-tidal carbon dioxide (ETCO₂). VVt was assessed by coefficient of variation (CV). Time series of breath by breath Vt were inspected for abnormal pattern. SH were assessed by Nijmegen questionnaire (NQ). ETCO₂ was monitored by capnography. Differences between healthy controls and SA patients were explored using one-way ANOVA. Results: Mean NQ score was higher in SA patients than in healthy controls (p=0.00). ETCO₂ levels were significantly correlated with NQ score (r =-0.8, p <0.01) in the SA patients but not in healthy volunteers (r= -0.6, p>0.01). Time series analysis revealed sporadic episodes of frequent sighs in both groups. No significant differences between groups for any BPP were identified. Conclusion: The recorded BPP did not differentiate between the SA patients and healthy volunteers in our small study. The higher SH found in the SA group do not appear to be associated with differences in BPP. This study raised doubt that there is a 'pattern' that is common within the SA population and therefore BPP must be considered on an individual basis.