CHEST HIGH RESOLUTION COMPUTED TOMOGRAPHY (HRCT) AND LUNG FUNCTION INDICATE HETEROGENEITY OF ASTHMA EXACERBATIONS

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To date, no HRCT studies have assessed airway and lung parenchymal changes in acute asthma and previous studies using induced bronchoconstriction used methacholine rather than allergen without correcting for lung volume changes. **Aim:** Evaluate changes in lung function and HRCT in patients during an acute exacerbation of asthma compared to a convalescent phase. **Method:** A pilot prospective observational study of patients (non smokers or < 5 pack years) hospitalised with acute exacerbation of asthma, on clinical grounds was conducted within 72 hours of admission and again 6 weeks post discharge. Static and dynamic lung volumes and spirometrically gated HRCT images were acquired in the acute and convalescent phase. HRCT images were obtained at the same 3 sets of absolute lung volumes. Anatomical landmarks were used to ensure comparable images during acute and convalescent asthma. **Results:** Subjects (4 male, 4 female), mean age 29.5 years (SD 9.20), mean BMI 24.48 kg/m^2 (SD 2.5). Spirometry and lung volume changes were observed including reduced airflow obstruction and gas trapping but no significant changes in TLC or seated-supine VC was seen. To date chest HRCT images analysed in 4 of the 8 subjects demonstrated a group of changes including: variable changes in airway wall thickness and airway luminal diameter as well as some gas trapping, atelectasis and "ground glass" opacification of the lung parenchyma, suggesting alveolar disease. **Conclusion:** All patients demonstrated significant improvement with lung function on resolution of their acute exacerbation, with considerable inter-patient variability. HRCT in 4 patients suggest that significant anatomic variations characterise asthma exacerbations. The presence of alveolar involvement on HRCT was an unexpected finding. TLC was not significantly changed suggesting lack of hyperinflation during exacerbation in this group. **Key Words**: HRCT, Spirometry, Asthma