

[Poster Board # 515] Airway Wall Thickness By HRCT Does Not Affect Airway Distensibility In Asthma And COPD, [Publication Page: A3737]

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Rationale. In asthma and COPD, the functional alterations can be defined not only by the degree of bronchial obstruction but also by the magnitude of the airway distensibility (AD) in response to deep inspirations (DIs). The current study was designed to test the hypothesis that airway wall thickness affects the DI-induced AD as assessed by HRCT. To this aim, we tested AD in patients affected by asthma and COPD with comparable degree of bronchial obstruction.

Methods. Twelve asthmatics (M/F: 7/5) and 8 COPD (M/F: 7/1) with comparable degree of bronchial obstruction (FEV1% pred.: 69.0±4.8% vs. 61.3±5.9%, p=0.31; asthma vs. COPD) were submitted to clinical and functional evaluation. Subjects underwent HRCT evaluation, performed by spiral computed tomography. AD was measured by applying the following formula to each individual airway: (Airway diameter at TLC – Airway diameter at FRC)/ Airway diameter at FRC. Airway wall thickness was also calculated by using the VIDA software, and expressed as a fraction of the diameter (AWF).

Results. A total of 701 airways (range 20 to 38 airway per subject; 2.0 to 23.1 mm in diameter) were analyzed. Mean AD was 14±3.5% in asthmatics and 17±4.3% in COPD (p=0.58). No significant differences between the two groups were detected when AD was calculated for the small (p=0.27), the medium (p=0.94) and the large (p=0.40) airways, respectively. We did not find significant differences between groups in mean airway wall thickness (at TLC: 0.52±0.01% in asthmatics and 0.51±0.01% in COPD, p=0.50; at FRC: 0.55±0.01% in asthmatics and 0.55±0.01% in COPD, p=0.94). Also, we did not detect any difference between groups in AWF when airways were examined by size (between groups ANOVA: p=0.21, p=0.8, p=0.07 for small, medium and large airways, respectively). To explore whether AWF influences the degree of AD, we performed simple linear regression analyses, which did not yield any statistically significant association.

Conclusions Contrary to the concept that increased thickness of the airway wall, such as that observed in the more severe stages of chronic obstructive diseases, could induce greater stiffness of airways, thus opposing airway distension, we did not demonstrate any association between airway wall thickness and distensibility of the airways. Other factors, such as those related to the parenchyma (i.e. airway-to-parenchyma interdependence), should be considered.

Am J Respir Crit Care Med 187;2013:A3737

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Session Info: Poster Discussion Session, [B109] TECHNOLOGIC ADVANCES IN IMAGING FOR PHENOTYPING LUNG DISEASE

Day/Date: Monday, May 20, 2013

Session Time: 2:00 PM - 4:30 PM

Poster Viewing: 2:00 PM - 3:00 PM

Discussion: 3:00 PM - 4:30 PM

Room: Room 201 C (200 Level) Pennsylvania Convention Center