



## Pulmonary Physiology

TOPIC: Pulmonary Physiology

TYPE: Original Investigations

### CHARACTERIZATION OF THE AIRWAY WALL COMPLIANCE AFTER TREATMENT WITH BRONCHODILATOR IN COPD PATIENTS

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**PURPOSE:** The study aimed to measure the variation of intrathoracic airway wall compliance (AWC) after acute administration of beta-2 agonist with rapid onset of action in COPD patients.

**METHODS:** In a group of 10 patients suffering from COPD, intrathoracic Airway Wall Compliance (AWC) was measured at middle (50% of Forced Vital Capacity (FVC)) and low (75% of FVC) lung volumes using the interrupter method during a forced expiratory maneuver in basal conditions and after acute inhalation of Salbutamol (400 mcg by MDI). Ten healthy subjects were examined as control group.

**RESULTS:** Lower values of baseline intrathoracic AWC at both lung volumes were found in COPD patients ( $1.72 \pm 0.20$  ml/cmH<sub>2</sub>O and  $1.08 \pm 0.20$  ml/cmH<sub>2</sub>O, respectively) as compared to controls ( $2.28 \pm 0.27$  ml/cmH<sub>2</sub>O and  $1.44 \pm 0.22$  ml/cmH<sub>2</sub>O, respectively) ( $p < 0.001$ ). In COPD patients, airway wall compliance increased significantly at both lung volumes after salbutamol, amounting to  $1.81 \pm 0.38$  ml/cmH<sub>2</sub>O and  $1.31 \pm 0.39$  ml/cmH<sub>2</sub>O, respectively ( $p < 0.01$ ), but the relative change was not different from that observed in controls.

**CONCLUSIONS:** In COPD patients, AWC is reduced compared to controls, likely because of their remodeling process, but after bronchodilator, the intrathoracic airways become more compliant.

**CLINICAL IMPLICATIONS:** The consequent airways increase of their collapsibility under high positive pleural pressure can negatively influence the airway caliber improvement after bronchodilator, as assessed by the FEV1 changes during the forced expiratory maneuver, underestimating the effective bronchodilation.

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