European Respiratory Society
Annual Congress 2012

Abstract Number: 3186

Publication Number: P870

Abstract Group: 4.1. Clinical physiology and Exercise

Keyword 1: Asthma - diagnosis **Keyword 2:** Lung function testing **Keyword 3:** Lung mechanics

Title: Effects of airway smooth muscle activation and unloading on short-term variability of inspiratory impedance in healthy and asthmatic subjects

Alessandro 13806 Gobbi alessandro.gobbi@polimi.it [1], C. 13807 Gulotta c.gulotta@sanluigi.piemonte.it MD [2], Prof. Raffaele 13808 Dellacà raffaele.dellaca@polimi.it [1], Pasquale 13809 Pompilio pasquale.pompilio@polimi.it [1], Dr. A. 13810 Antonelli antonelli.a@ospedale.cuneo.it MD [3], Dr. R. 13811 Torchio r.torchio@inrete.it MD [4], Dr. P. 13812 Parola paoloparola@yahoo.it MD [5], Dr. L. 13813 Dutto lucadutto@yahoo.it MD [6], Dr. C. 13814 Crimi ccrimi@sism.org MD [7], Prof. V. 13815 Brusasco vito.brusasco@unige.it MD [8] and Prof. R. 13816 Pellegrino pellegrino.r@ospedale.cuneo.it MD [3]. [1] Bioingegneria, Politecnico di Milano University, Milano, Italy ; [2] MAR 1, AOU S. Luigi, Orbassano, TO, Italy ; [3] Fisiopatologia Respiratoria, Ospedale S.Croce e Carle, Cuneo, Italy ; [4] Lab FPR e Centro Sonno, AOU S. Luigi, Orbassano, TO, Italy ; [5] Anestesia Rianimazione, Ospedale S.Croce e Carle, Cuneo, Italy ; [6] Medicina d'Urgenza, Ospedale S.Croce e Carle, Cuneo, Italy ; [7] Pneumologia, Università, Catania, Italy and [8] Fisiopatologia Respiratoria, Università, Genova, Italy .

Body: Background: Short-term temporal variability of respiratory impedance is increased in asthma. Aim: To examine whether airway smooth muscle unloading alters the pattern of bronchoconstrictor response as assessed by changes in inspiratory reactance (Xrs) and resistance (Rrs). Methods: 14 mild asthmatics and 9 healthy male subjects were studied at control conditions, during methacholine (MCh)-induced bronchoconstriction, after chest wall strapping and during MCh-induced bronchoconstriction with chest wall strapped. Rrs and Xrs were measured at 5 Hz by forced oscillation technique. Rrs and Xrs variability over 5-min periods were estimated from the interquartile range of frequency distribution (RrsIQR and XrsIQR, respectively). Results: The percent increments of XrsIQR with MCh, strapping and strapping plus MCh were larger than those of RrsIQR, though statistical significance was achieved only with the combination of strapping plus MCh ($p<0.01$, ANOVA).

Conclusions: Activation of unloaded airway smooth muscle causes greater instability in the airways contributing to the increase in Xrs than in those contributing to Rrs in both healthy and asthmatic subjects, suggesting occurrence of clustered bronchoconstriction.