# European Respiratory Society
# Annual Congress 2012

**Abstract Number:** 2013

**Publication Number:** 4720

**Abstract Group:** 5.2. Monitoring Airway Disease

**Keyword 1:** Asthma - mechanism **Keyword 2:** Lung function testing **Keyword 3:** Physiological diagnostic services

**Title:** Alterations in static lung volumes during methacholine challenge (MCH) tests, assessed by whole-body plethysmography using the aerosol provocation system (APS)

Richard 2325 Kraemer richard.kraemer@swissonline.ch MD [1], Gaby 2326 Giger gabi.giger@bluewin.ch [2], Thomas 2327 Sigrist thomas.sigrist@barmelweid.ch MD [2] and Martin 2328 Frey martin.frey@barmelweid.ch MD [2]. [1] Department of Clinical Research, University of Berne, Inselspital, Berne, Switzerland, CH-3010 and [2] Clinical Research Unit, Klinik Barmelweid, Switzerland, CH-5017 .

**Body:** Rationale. Airway hyperreactivity (AHR) is a characteristic feature of asthma, and methacholine challenge tests (MCT) are well established in asthma diagnostics and research, to quantitate AHR. Cut points have arbitrarily been selected, defining a fall of 20% in $FEV_1$ as $PC_{20}$. By this technical approach, however, changes in end-expiratory resting level cannot be detected. MCT using APS technology integrated in the Jaeger whole-body plethysmograph features the possibility to evaluate changes of airway dynamics concomitantly with changes of lung volumes [1]. Objectives. We aimed to assess changes of $FRC_{pleth}$, IC, ERV and hence RV and TLC during MCT, and comparing changes of effective specific airway conductances ($sG_{eff}$, $sG_{0.5}$, $sG_{tot}$) in relation to changes effected to $FEV_1$ and $MEF_{50}$. Methods. We retrospectively analysed data from our hospital database including 140 test persons (asthmatics and controls; 59 males; 81 females; age: 11 to 82 y), in whom MCT have been performed. Methacholine was administered during 3 consecutive cumulative challenge levels (P1:0.2 mg; P2:1.0 mg; P3:2.2 mg) computerized by the APS system. Results. During MCT not only airway mechanics, but also static lung volumes ($FRC_{pleth}$, IC) changed consistently. Conclusions. In the assessment of AHR by MCT $sG_{eff}$ and and $sG_{tot}$ qualified as most sensitive target parameter, taking into account changes of airway dynamics concomitantly with changes of lung volumes. Comparison between volume-time and flow-volume parameters with plethysmographically assessed $sG_{eff}$, $sG_{0.5}$ during MCT is presented in abstract 850930.
[1]. Matthys H, et al.: Respiration: 1975;32(2):121-134.