**Localization of Airway and Lung Ventilation Effects of Intravenous Allergen and Methacholine Challenge Studied by Synchrotron Radiation**

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Although inhaled methacholine is routinely used to assess bronchial hyper-reactivity, little is known about the differences in the distribution of its effect in the bronchial tree as compared to an allergen challenge.

We performed K-edge subtraction imaging (KES) in healthy and ovalbumine-sensitized rabbits at the baseline conditions, during intravenous infusion of methacholine (MCh,10 mug/kg/min), and following intravenous injection of the allergen, ovalbumine (OVA, 2.0 mg). Central airway luminal area and the ventilated alveolar area in the lung periphery were quantified from the KES-CT images (Bayat, S. et al. J Appl Physiol. 2006; 100(6):1964-73).

MCh infusion induced a reduction in central airways luminal area in both healthy and sensitized animals, with a smaller effect in ventilated alveolar area. Recovery of both parameters was complete following discontinuation of MCh. In the contrary, OVA challenge in the sensitized animals induced marked reduction both in central airways luminal area and in the ventilated alveolar area to a similar extent but not in healthy animals.

These results suggest that non-specific airway challenge with intravenous MCh has a predominant bronchoconstriction effect on the central airways, whereas a specific allergen challenge with intravenous OVA induces constriction of the same magnitude both in the central and peripheral airways, but only in sensitized animals.

KEYWORDS: K-edge subtraction, xenon, in vivo imaging, computed tomography, rabbits, experimental asthma