

Blood eosinophils and lung function decline in young adults.

Robert J. Hancox¹, Ian D Pavord², Malcolm R. Sears³.

1. Department of Preventive and Social Medicine, Dunedin School of Medicine, University of Otago, Dunedin, New Zealand. 2. Nuffield Department of Medicine, University of Oxford, Oxford, UK. 3. Firestone Institute for Respiratory Health, Michael de Groote School of Medicine, McMaster University and St Joseph's Healthcare, Hamilton, Ontario, Canada.

Abstract (1796 characters (max permitted inc. title=1810))

Title: Blood eosinophils and lung function decline in young adults.

Background: Eosinophilic airway inflammation and airway remodelling are characteristic features of asthma, but the association between them is unknown.

Aim: To test the hypothesis that blood eosinophil counts would be associated with the development of airflow obstruction in a population-based cohort of young adults (n=1037).

Methods: Blood eosinophils and spirometry were measured at ages 21, 26, 32, and 38 years. Associations between spirometry and eosinophil counts were analysed using linear mixed models with fixed effects for age and random effects for participants to accommodate repeated measures, with adjustment for sex, cumulative tobacco smoking, childhood and adult asthma, and spirometric measures at age 18. We further analysed associations between mean eosinophil counts and changes in spirometry from ages 21 to 38 years.

Results: Higher eosinophils were associated with lower FEV₁/FVC ratios and lower percent-predicted FEV₁ values for both pre- and post-bronchodilator spirometry (p values < 0.05). Although absolute eosinophil counts were higher in participants with

asthma, the associations between eosinophil counts and spirometry were similar among participants with and without asthma or symptoms of wheeze. Higher mean eosinophil counts between ages 21 and 38 were associated with enhanced declines in FEV₁/FVC ratios and FEV₁ values.

Conclusions: Blood eosinophil counts are associated with airflow obstruction independently of asthma and smoking. Higher eosinophil counts are associated with enhanced declines in lung function and increasing airflow obstruction from age 21 to 38 suggesting that eosinophilia is a risk factor for the development of progressive airflow obstruction even in those without respiratory disease or symptoms.