

## COPD and environmental risk factors other than smoking

### 5. Eosinophilia

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#### 1. Papers identified

Using the procedures describe in “COPD and risk factors other than smoking. 1. Identifying Relevant Papers,” nine papers were identified as relevant.<sup>1-9</sup>

#### 2. The papers

Birring et al (2003)<sup>1</sup> describe a condition called “eosinophilic bronchitis” (EB). This is “characterised by chronic cough in individuals with no symptoms or objective evidence of variable airflow obstruction, normal airway hyperresponsiveness ... and a sputum eosinophilia.” They note that “several studies have observed that in patients with COPD with no history of asthma and no bronchodilator reversibility there is sputum evidence of an airway eosinophilia.”

Brightling et al (1999)<sup>3</sup> described the case history of a 48-year-old male who had never smoked, presented with an isolated chronic cough, and had normal spirometric values, peak flow variability and airway responsiveness, but an induced sputum eosinophil count of 33% (normal <1%). Over a two year period the cough was treated, but the eosinophilia persisted, and he developed airflow obstruction.

Brightling and Pavord (2000)<sup>2</sup> is a review of EB, an important cause of chronic cough. As in the previous papers, they suggest EB may develop into fixed airway obstruction.

Park et al (2004)<sup>8</sup> followed up, for up to four years, 24 patients with EB who were given corticosteroids until the cough subsided. Five of the 24 had recurrent EB, with progressive reduction in FEV<sub>1</sub> >20% seen in three of

them, one developing asthma. The authors concluded that “these results suggest that repeated episode of EB is associated with the development of chronic airflow obstructing, including asthma.”

Hancox et al (2001)<sup>5</sup> followed up 12 EB patients for up to 10 years and found that one subject acquired asthma symptoms.

Hosper et al (1999)<sup>6</sup> describe mortality follow-up to 1995 of 7,556 participants of respiratory surveys in 1964-1972 in three Dutch towns. During this period there were 121 deaths where COPD was the underlying cause and a further 137 where it was secondary. The authors related that there was an association between eosinophilia and COPD mortality but this was restricted to those who had reported asthma attacks. Compared to those who reported asthma attacks at baseline but without eosinophilia, the relative risk was 4.80 (95% CI 1.9-11.9) for COPD as a primary cause and 3.90 (2.05-7.40) for COPD as primary or secondary. Eosinophilia is frequently present in asthmatic patients and the authors speculated that the association might be due to misclassification of cause of death, with some asthma deaths mislabelled as COPD.

Three reports related to eosinophilia derive from a long-term general population prospective study conducted in Tucson, Arizona. The first of these, by Burrows et al (1980),<sup>4</sup> carried out a detailed investigation of 290 subjects. Eosinophilia was associated with definite impairment of ventilatory function, regardless of smoking and skin test reactivity. The presence of eosinophilia identified a predominantly female group of elderly nonsmokers with markedly impaired ventilatory function. Burrows et al considered that these subjects appeared to fall into the clinical category of “asthmatic bronchitis.”

Two further papers appeared in 1995. These were based on 13 year follow up of the Tucson population. Lebowitz et al<sup>7</sup> reported that “The incidence rate of newly diagnosed CB was significantly higher in those with

eosinophilia (13.7%) than without eosinophilia (6.7%)” and noted that new cases with eosinophilia had similar initial FEV<sub>1</sub> but much larger declines in function than new cases without eosinophilia. Postma and Lebowitz<sup>9</sup> noted that “the prevalence of eosinophilia was high in those with newly diagnosed chronic bronchitis without asthma. However, this was not the case in those with persistent chronic bronchitis without asthma.”

### 3. Overall impressions

The data are limited and the Dutch and Tucson studies provide the most relevant information. However it remains far from clear that in non-asthmatic healthy individuals the presence of eosinophilia predicts COPD.

### 4. References

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