

# Association between exhaled breath condensate nitrate plus nitrite levels with ambient coarse particle exposure in subjects with airways disease

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**Abstract:** Objectives Studies of individual inflammatory responses to exposure to air pollution are few but are important in defining the most sensitive markers in better understanding pathophysiological pathways in the lung. The goal of this study was to assess whether exposure to airborne particles is associated with oxidative stress in an epidemiological setting.

**Methods** The authors assessed exposure to particulate matter air pollution in four European cities in relation to levels of nitrite plus nitrate (NO<sub>x</sub>) in exhaled breath condensate (EBC) measurements in 133 subjects with asthma or chronic obstructive pulmonary disease using an EBC capture method developed for field use. In each subject, three measurements were collected. Exposure measurements included particles smaller than 10 µm (PM<sub>10</sub>), smaller than 2.5 µm (PM<sub>2.5</sub>) and particle number counts at a central site, outdoors near the subject's home and indoors.

**Results** There were positive and significant relationships between EBC NO<sub>x</sub> and coarse particles at the central sampling sites (increase of 20.4% (95% CI 6.1% to 36.6%) per 10 µg/m<sup>3</sup> increase of coarse particles of the previous day) but not between EBC NO<sub>x</sub> and other particle measures. Associations tended to be stronger in subjects not taking steroid medication.

**Conclusions** An association was found between exposure to ambient coarse particles at central sites and EBC NO<sub>x</sub>, a marker of oxidative stress. The lack of association between PM measures more indicative of personal exposures (particularly indoor exposure) means interpretation should be cautious. However, EBC NO<sub>x</sub> may prove to be a marker of PM-induced oxidative stress in epidemiological studies.

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