Title: Air pollution and asthma control in the Epidemiological study on Genetics and Environment of Asthma (EGEA)

Abstract No. 0506

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Abstract

Introduction: Asthma control reflects the disease activity in the past months and has been underlined in the updated asthma guidelines. Its association with air pollution is not well known. The objective is to assess the association between modeled PM$_{10}$, NO$_2$, and O$_3$ concentrations and asthma control in the EGEA2 study (2003-2007).

Methods: Modeled outdoor PM$_{10}$, NO$_2$, and O$_3$ estimates were linked to each residential address using the 4-km grid air pollutant surface developed by the French Institute of Environment for the 2004 year. Asthma control was defined in three classes based on questions from the current GINA guidelines (symptoms frequency and Beta-2 agonist intake in the last 3 months, lung function (FEV1), and exacerbations in the past year) in 501 subjects with current asthma. Multinomial logistic regressions were conducted adjusted on sex, age, body mass index, education, smoking and use of inhaled corticosteroids. Odds Ratios (OR) are reported per Inter Quartile Range (IQR).

Results: Medians concentrations ($\mu$g.m$^{-3}$) were 32 (IQR 25-38) for NO$_2$ (n=465), 46 (41-52) for O$_3$ (n=481) and 21 (18-21) for PM$_{10}$ (n=481). 44%, 29% and 27% had controlled, partly-controlled and uncontrolled asthma respectively. The association of PM$_{10}$ with partly-controlled asthma was not significant (OR 1.14 (95%CI 0.91-1.43)) but reached significance for uncontrolled asthma (OR 1.58 (1.23-2.03)). For O$_3$, the pattern was less consistent with a stronger association for partly-controlled than...
uncontrolled asthma (OR 1.29 (0.96-1.76) and 1.19 (0.86-1.66) respectively). When including both pollutants in the same model, the pattern persisted, as well as in never-smokers and those not exposed to environmental tobacco smoke. No associations were found for NO₂.

Conclusions: the results suggest that PM₁₀ and O₃ are associated with partly-controlled and uncontrolled asthma, however the interpretation of the results require some caution and more analysis are needed to better understand their implication.

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