Air pollution and asthma severity in adults

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BACKGROUND/OBJECTIVES: There is evidence that exposure to air pollution affects asthma, but the effect of air pollution on asthma severity has not been addressed. The aim was to assess the relation between asthma severity during the past 12 months and home outdoor concentrations of air pollution. METHODS: Asthma severity over the past 12 months was assessed in two complementary ways among 328 adult asthmatics from the French Epidemiological study on the Genetics and Environment of Asthma (EGEA) examined between 1991 and 1995. The four-class severity score integrated clinical events and type of treatment. The five-level asthma score is based only on the occurrence of symptoms. Nitrogen dioxide (NO(2)), sulphur dioxide (SO(2)) and ozone (O(3)) concentrations were assigned to each residence using two different methods. The first was based on the closest monitor data from 1991 to 1995. The second consisted of spatial models that used geostatistical interpolations and then assigned air pollutants to the geo-coded residences (1998). RESULTS: Higher asthma severity score was significantly related to the 8-hour average of ozone during April-September (O(3)-8 h) and the number of days (O(3)-days) with 8-hour ozone averages above 110 microg.m(-3) (for a 36-day increase, equivalent to the interquartile range, in O(3)-days, odds ratio 2.22 (95% confidence interval 1.61 to 3.07) for one class difference in score). Adjustment for age, sex, smoking habits, occupational exposure, and educational level did not alter results. Asthma severity was unrelated to NO(2). Both exposure assessment methods and severity scores resulted in very similar findings. SO(2) correlated with severity but reached statistical significance only for the model-based assignment of exposure. CONCLUSIONS: The observed associations between asthma severity and air pollution, in particular O(3), support the hypothesis that air pollution at levels far below current standards increases asthma severity

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