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Long-term exposure to air pollution and incidence of rhinitis in adults: the Constances cohort

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ABSTRACT

BACKGROUND AND AIM - The link between air pollution and incidence of rhinitis, especially in adults, is poorly understood. We aimed to study the associations between long-term exposure to nitrogen dioxide (NO2), particulate matter ≤2.5 µm (PM2.5) and black carbon (BC) and incident rhinitis, among adults from Constances, a large French population-based cohort. METHODS - At inclusion (in 2012/2013) and at follow-up (in 2014), questionnaires included questions on the presence of rhinitis symptoms over lifetime. We defined incident rhinitis as: 1) "General incidence": when the participant reported never rhinitis at inclusion but reported rhinitis at follow-up; 2) "Strict incidence": when in addition the age of onset of rhinitis was higher than the age at inclusion. Annual concentrations of NO2, PM2.5 and BC were estimated at the participants' residential address by European land-use regression models. Associations between each air pollutant and incident rhinitis were assessed using logistic models adjusted for age, sex, smoking, education level and French deprivation index. RESULTS - Among the 19,829 participants with available data at inclusion and follow-up, 6,644 reported never rhinitis, 2,516 were categorized as “general incident” rhinitis, and 103 as “strict incident” rhinitis. Adjusted(a) ORs (95% Confidence Interval) for “general incidence” were 1.07 (0.99, 1.17) per 5 µg/m3 PM2.5, 1.13 (1.03, 1.24) per 10-5m-1 BC, and 1.07 (1.00, 1.15) per 15 µg/m3 NO2. aORs for “strict incidence” were 1.30 (0.91, 1.86) for PM2.5, 1.40 (0.93, 2.10) for BC, and 1.27 (0.95, 1.70) for NO2. CONCLUSIONS - Air pollution may increase the risk of incident rhinitis in adults in the general population. Interestingly, although the associations were not statistically significant for “strict incidence”, probably due to sample size, ORs were higher than for “general incidence”, suggesting the importance of the outcome definition.

KEYWORDS: Air pollution; Incidence; Long-term exposure; Respiratory outcomes; Environmental epidemiology

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