Zare Sakhvidi MJ, Yang J, Lemogne C, Berr C, Chen J, de Hoogh K, Lequy E, Vienneau D, Goldberg M, Zins M, Jacquemin B

Air pollution exposure and different dimensions of depression: findings from the French CONSTANCES cohort

ABSTRACT

BACKGROUND AND AIM - The evidence for the association between air pollution exposure and depression is growing. We aim to explore this association across different dimensions of depressive symptoms. METHODS - Data from the enrollment phase of the French CONSTANCES cohort were analyzed cross-sectionally. Annual concentrations of PM2.5, black carbon (BC), and Nitrogen dioxide (NO2) from the ELAPSE land-use regression models were assigned at the residential addresses of participants. The z-score of depressive symptoms measured by the Centre of Epidemiologic Studies Depression (CES-D) questionnaire, and its four dimensions (depressive affect, interpersonal relations, low positive affect, somatic complaints) were used as outcomes in multiple linear regression models (reported as β and 95% confidence interval (CI) for an interquartile range (IQR) increase in exposure), for each pollutant separately. Stratified analyses were performed by sex, income, family status, education and community-level deprivation index. RESULTS - Of the 116,170 included participants (mean age: 46.4±13.6 years), 53.2% were women. The median exposure to PM2.5, BC and NO2 was 14.4 µg/m3 (IQR=4.4), 1.4 10-5/m (IQR=0.8), and 19.8 µg/m3 (IQR=15.3), respectively. The prevalence of depressive symptoms in women was higher than in men (27.7% vs. 17.0%). Exposure to BC and NO2 were significantly associated with higher total CES-D and all dimensions scores. PM2.5 was associated with depressive affect only (β= 0.03; 95% CI=0.01: 0.04). For all models and pollutants, the largest estimate was observed for the depressive affect. We found stronger associations for men, lower-income participants, low education groups, and those living alone. CONCLUSIONS - Air pollution exposure was associated with all dimensions of depressive symptoms and not only somatic complaints. Considering the burden related to depression, its prevalence, and the increasing trend of urbanization which is associated with higher exposure to pollutants, our findings are of utmost importance.

KEYWORDS: Depressive symptoms; Particulate matters; Black carbon; Nitrogen dioxide; CONSTANCES Cohort

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