

Perinatal air pollution exposure and development of asthma from birth to age 10 years

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Abstract

Within-city variation in air pollution has been associated with childhood asthma development, but findings have been inconsistent. We examined whether perinatal air pollution exposure affected asthma onset during “pre-school and “school age” periods in a population-based birth cohort.

65254 children born between 1999 and 2002 in the greater Vancouver metropolitan region were followed until age 10 years using linked administrative health databases. Asthma cases were sex- and age-matched to five randomly chosen controls. Associations between exposure to air pollutants estimated with different methods (interpolation (inverse-distance weighted (IDW)), land use regression, proximity) and incident asthma during the pre-school (0–5 years) and school age (6–10 years) periods were estimated with conditional logistic regression.

6948 and 1711 cases were identified during the pre-school and school age periods, respectively. Following adjustment for birthweight, gestational period, household income, parity, breastfeeding at discharge, maternal age and education, asthma risk during the pre-school years was increased by traffic pollution (adjusted odds ratio using IDW method per interquartile increase (95% CI): nitric oxide 1.06 (1.01–1.11), nitrogen dioxide 1.09 (1.04–1.13) and carbon monoxide 1.05 (1.01–1.1)). Enhanced impacts were observed amongst low-term-birthweight cases. Associations were independent of surrounding residential greenness.

Within-city air pollution variation was associated with new asthma onset during the pre-school years.