PRENATAL EXPOSURE TO OUTDOOR AIR POLLUTION IN RELATION TO RESPIRATORY HEALTH, ECZEMA AND OTITIS EARLY IN LIFE

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Background and Aims: Prenatal exposure to air pollution may effect respiratory health and increase the susceptibility towards infections during early childhood. We assessed the relationship between maternal exposure to traffic-related air pollution and respiratory health, eczema and otitis in infants from four areas within the Spanish INMA (Environment and Childhood) study.

Methods: Temporally-adjusted land-use regression models were developed to predict pregnancy exposures to outdoor NO_2 and benzene for 2,173 women. Information on chest infections (bronchitis, bronchiolitis and pneumonia), wheezing, eczema and otitis was obtained by questionnaire at 1-1.5 years old. Associations between air pollutants exposure and health outcomes were assessed with log-binomial regression models, controlled for potential confounders. Because of heterogeneity, the association between air pollution and otitis was assessed by area. Sensitivity analyses were performed for non-movers and for women who spent more time at home during pregnancy.

Results: Mean (sd) exposure during pregnancy was 28.85 (11.25) $\mu g/m^3$ for NO_2 and 1.56 (0.93) $\mu g/m^3$ for benzene. Adjusted relative risks (RR) associated with an increase of $10\mu g/m^3$ in NO_2 exposure were 1.06 (95% CI=1.00-1.14) for chest infections, 1.01 (95% CI= 0.92-1.11) for eczema, and 1.05 (95% CI=0.99-1.13) for wheezing. NO_2 exposure was significantly associated with otitis in three out of the four areas, with RRs ranging between 1.23 and 1.31. An increase of 1 $\mu g/m^3$ in benzene exposure was associated with a RR of 1.07 (95% CI=0.99-1.16) for chest infections, 1.03 (95% CI= 0.93-1.14) for eczema, and 1.05 (95% CI=0.98-1.12) for wheezing. All the RRs were higher among the subset of infants whose mothers spent more time at home during pregnancy.

Conclusions: There is some indication that prenatal exposure to traffic-related air pollution may contribute to the development of respiratory effects and otitis in early life. To what extent these associations are influenced by postnatal exposures need to be elucidated.