

OUTDOOR NO₂ EXPOSURE IS ASSOCIATED WITH PERSISTENT COUGH DURING THE FIRST YEAR OF LIFE

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Background and Aims: Because children's lungs and immune system are not completely developed they are more susceptible to respiratory disease as well as more vulnerable to ambient pollution. We assessed the relation between prenatal and postnatal NO₂ levels and the development of Lower Respiratory Tract Infections (LRTI), wheezing and persistent cough during the first year of life.

Methods: Study population were 352 children from a birth cohort in Valencia, Spain. Prenatal exposure to NO₂ was measured at 93 sampling sites spread over the study area during four different sampling periods of 7 days each. It was modelled for each residential address through land use regression using the empirical measurements and geographic information systems data. Postnatal exposures were measured indoor and outdoor the residence with passive samplers during 14 days once in each home. Outcomes studied were any episode of LRTI during the child's first year of life diagnosed by a doctor (bronchitis, bronchiolitis or pneumonia), wheezing (defined as whistling sounds coming from the chest), and persistent cough (more than three consecutive weeks). Outcomes and potential confounders were obtained from structured questionnaires. Multiple logistic regression was used to explore associations.

Results: Cumulative incidence (CI) was 30.40% for LRTI (23.01% bronchiolitis, 11.93% bronchitis and 1.42% pneumonia), 26.14% for wheezing and 6.25% for persistent cough. Adjusted odds ratio (95% confidence interval) per 10 µg/m³ increment in postnatal outdoor NO₂ concentration was for persistent cough 1.40 (1.02-1.92). We also found evidence of an association with bronchiolitis, bronchitis and persistent cough in different prenatal periods, although it was not statistically significant.

Conclusions: Our results support that exposure to outdoor NO₂ during first year increase the risk of persistent cough.

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