

CROSS-SECTIONAL ASSOCIATION BETWEEN ROAD TRAFFIC NOISE AND HYPERTENSION IN A POPULATION-BASED SAMPLE IN GIRONA, SPAIN (REGICOR-AIR PROJECT)

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ABSTRACT

Background and aims: Long-term exposure to traffic-related noise may increase blood pressure levels and induce hypertension, especially at night-time; however the evidence is still heterogeneous. Besides, long-term exposure to traffic-related air pollution has been also associated with cardiovascular health and it may confound the effects of road traffic noise on common cardiovascular endpoints. We evaluated the association between traffic-related noise and hypertension, adjusting for traffic-related air pollution in the city of Girona, north-eastern Spain within the REGICOR-AIR project.

Methods: We evaluated 3480 baseline participants (35-83 years old) corresponding to the population-based HERMES cohort (years 2003-2005) with blood pressure measurements and with socio-demographic, dietary and physical activity information. Outdoor residential road traffic noise levels for night ($L_{Aeq,night(9pm-7am)}$) and 24 hours ($L_{Aeq,24h}$), and outdoor residential nitrogen dioxide (NO_2) levels were derived with a validated city-specific noise model (Environmental Noise Directive 2002/49/EC) and a land-use regression model, respectively. Logistic regression models were performed for hypertension (defined as systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg or hypertension treatment) and traffic-related noise, adjusting for relevant confounders.

Results: A non-significant association was found between long-term exposure to road traffic noise and hypertension for an increase in 10dB(A) in $L_{Aeq,night}$ (OR=1.02; 95%CI 0.86-1.20) and in $L_{Aeq,24h}$ (OR=1.04; 95%CI 0.88-1.22). This association remained unchanged after adjusting for NO_2 . No significant associations were observed in the stratified analyses by gender or age groups.

Conclusions: The overall non-significant positive effect estimates are in line with some previous epidemiological studies. However, we could not confirm some of the reported significant effects observed in previous studies by gender or age groups. Further analyses will include the evaluation of coping behaviour against noise and sensitivity analyses on the noise exposure assessment. Furthermore, we will also study the association between blood pressure and road traffic noise.