

Publication

Arterial blood pressure and long-term exposure to traffic-related air pollution : an analysis in the European study of cohorts for air pollution effects (ESCAPE)

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BACKGROUND: Long-term exposure to air pollution has been hypothesized to elevate arterial blood pressure (BP). The existing evidence is scarce and country specific. OBJECTIVES: We investigated the cross-sectional association of long-term traffic-related air pollution with BP and prevalent hyper-tension in European populations. METHODS: We analyzed 15 population-based cohorts, participating in the European Study of Cohorts for Air Pollution Effects (ESCAPE). We modeled residential exposure to particulate matter and nitrogen oxides with land use regression using a uniform protocol. We assessed traffic exposure with traffic indicator variables. We analyzed systolic and diastolic BP in participants medicated and nonmedicated with BP-lowering medication (BPLM) separately, adjusting for personal and area-level risk factors and environmental noise. Prevalent hyper-tension was defined as ≥ 140 mmHg systolic BP, or ≥ 90 mmHg diastolic BP, or intake of BPLM. We combined cohort-specific results using random-effects meta-analysis. RESULTS: In the main meta-analysis of 113,926 participants, traffic load on major roads within 100 m of the residence was associated with increased systolic and diastolic BP in nonmedicated participants [0.35 mmHg (95% CI: 0.02, 0.68) and 0.22 mmHg (95% CI: 0.04, 0.40) per 4,000,000 vehicles x m/day, respectively]. The estimated odds ratio (OR) for prevalent hyper-tension was 1.05 (95% CI: 0.99, 1.11) per 4,000,000 vehicles x m/day. Modeled air pollutants and BP were not clearly associated. CONCLUSIONS: In this first comprehensive meta-analysis of European population-based cohorts, we observed a weak positive association of high residential traffic exposure with BP in nonmedicated participants, and an elevated OR for prevalent hyper-tension. The relationship

of modeled air pollutants with BP was inconsistent.

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