

LONG-TERM EXPOSURE TO TRAFFIC-RELATED AIR POLLUTION, BLOOD PRESSURE AND RISK FOR SELF-REPORTED HYPERTENSION

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Background and aims: Previous studies have indicated that few days' exposure to air pollution might be associated with changes in blood pressure (BP) and the frequency of emergency hospital visits for hypertension. Little is known about the effects of long-term exposure to traffic-related air pollution on BP and risk for development of hypertension. The aims were to study whether long-term exposure to air pollution affected BP and risk for hypertension.

Methods: In 1993-1997, 57 053 participants aged 50-64 year were enrolled in the Danish population-based cohort study, Diet, Cancer and Health. At enrolment, systolic and diastolic BP were measured. Incident hypertension during a mean follow-up of 5.3 years was assessed by questionnaire.

Residential long-term NO_x, a marker of traffic-related air pollution, was estimated for the 1- and 5-year periods prior enrolment and prior a diagnosis of hypertension with AirGIS, a validated dispersion model. We conducted a cross-sectional analysis of associations between air pollution and BP at enrolment with linear regression in participants without anti-hypertensive medication (N=44,436), adjusting for traffic noise, measured short-term NO_x, meteorology and potential lifestyle confounders. Incident hypertension was analyzed with Cox regression, adjusting for traffic noise and potential lifestyle confounders.

Results: We found that a doubling in NO_x exposure during the one and five year periods preceding the enrolment was associated with a -0.55 (95% CI: -0.89; -0.20) and a -0.52 mm Hg (95% CI: -0.85; -0.18) lower systolic BP, respectively. Long-term exposure to NO_x was not associated with risk for development of hypertension; however living close to a major road increased the risk by 13% (95% CI: -3; 32%).

Conclusions: Long-term exposure to traffic-related air pollution was associated with a slightly lower BP, whereas it did not affect the risk for self-reported hypertension. More studies are warranted before any conclusions can be made.