The Impact of Noise on Pregnancy Outcomes: A Population-based Cohort Study

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ABSTRACT

Background: Noise exposure is a potent stressor previously linked to serious adverse health outcomes including cardiovascular disease. Yet despite evidence that some forms of prenatal maternal stress (such as subjective distress) are associated with adverse pregnancy outcomes, and evidence in animal models that noise influences pregnancy outcome, evidence of an association between noise and birth outcomes in humans is limited and inconsistent. We used a large population-based cohort to study the impact of residential noise exposure during pregnancy on birth outcome measures including small for gestational age, preterm birth, term birth weight, and low birth weight at term.

Methods: Linked administrative health data were used to identify 68,238 singleton births (1999-2002) with complete covariate data (sex, ethnicity, parity, birth month and year, income, education) and maternal residential history in Vancouver, Canada. We estimated exposure to noise with a deterministic model (CadnaA, DataKustik GmbH, Germany). We also examined the influence of air-pollution on noise-pregnancy outcome relations.

Results: All-source annual average noise exposure (L_{DEN}) was negatively associated with term birth weight [-19.1 gram per 6 dB(A), 95%CI -22.9; -15.3]. In joint air pollution-noise models, associations between term birth weight and noise remained largely unchanged. Findings for other outcomes such as small for gestational age and low term birth weight were consistent with the main finding.

Conclusion: Traffic may affect birth weight through exposure to both noise and air pollution. Future studies of traffic-related pollution and pregnancy outcomes should account for noise exposures.