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Effects of workplace noise exposure during pregnancy. Systematic review with Meta-analysis and Meta-regression

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ABSTRACT

The aim of this review was to summarize published epidemiological studies on the effects of workplace noise exposure during pregnancy.

Methods. An extensive search of the literature was conducted from Medline and Embase. Twenty-seven studies published in French or in English between 1970 and 2008 were selected. Each study was systematically evaluated regarding the following aspects: design, size of the study; external validity; population studied (method of selection, participation rate); pregnancy outcome (definition and measurement); noise exposure (definition, comparison group, measurement method); and confusion control (personal factors and other occupational exposures). For each pregnancy outcome, if the results could be combined, a meta-analysis was performed and when the number of studies was sufficient, a meta-regression was done. We searched for publication bias using the funnel plot tool. Finally, the strength of the evidence was classified as: strong, sufficient, suspicion or data do not allow a conclusion; after evaluation of the following criteria: biologic plausibility, statistical accuracy, validity and coherence.

Results. In the presence of noise exposure in the workplace, sufficient evidence (1.27; 95%CI:1.01-1.59) of increase for the risk of small-for-gestational-age was noted. A suspicion of increased risk exists for: spontaneous abortion (1.06; 95%CI:0.97-1.16), preterm delivery (1.13; 95%CI:0.57-2.24), pre-eclampsia (1.12; 95%CI:0.78-1.59) and gestational hypertension (1.42; 95%CI:0.83-2.44). Finally, the data do not allow a conclusion regarding the risks of stillbirth, congenital anomalies and low birth weight.

Conclusion. Although a modest increase in risk (27 %), the frequencies of noise exposure during pregnancy and small-for-gestational-age births, could result in a non-negligible public health impact.