Noise during pregnancy increases risk of hearing dysfunction in children

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A recently published study from the Institute of Environmental Medicine (IMM) at Karolinska Institutet shows that exposure to noise during pregnancy can damage the child's hearing, with an 80 percent increase in risk in occupational environments with particularly high decibel levels. The results strongly indicate that pregnant women should not be exposed to loud noise.

Whereas it was previously assumed that fetuses were well insulated from external noise, several studies have shown that noise, especially low-frequency noise, is physically conducted to the fetus. A link between noise exposure during pregnancy and hearing impairment is also corroborated by animal experiments. All in all, the available evidence shows that women should not be exposed to high levels of noise during pregnancy.

"The Swedish Work Environment Authority recommendation is that pregnant women should avoid noise levels of over 80 dBA, but unfortunately this recommendation is not always followed," says Jenny Selander, researcher at the IMM. "Our study shows how imperative it is for employers to observe this recommendation. Even if pregnant women themselves use ear protectors in noisy environments, the babies they're carrying remain unprotected."

The study, which is being published in the journal *Environmental Health Perspectives*, comprised over 1.4 million children born in Sweden between 1986 and 2008, and sourced its data on the mothers, such as occupation, smoking habits and presence at work during pregnancy, from the National Board of Health and Welfare's medical birth register and national central registers kept by Statistics Sweden and Försäkringskassan (the Swedish Social Insurance Agency). Occupation data were used to code exposure to noise at work during pregnancy into three classes: low (

Medium noise exposure

Some 290,000 mothers had worked in occupations with medium noise exposure while pregnant, and another 6,000 in occupations with high noise exposure. Hearing dysfunctions serious enough to warrant specialist examination was present in approximately 1 percent of the children. For the women who had worked in high-level noise

environments (over 85 dBA), the risk of hearing dysfunction in their children was 80 percent higher than for the women who had worked in low-exposure environments.

This increase was statistically significant and adjusted for differences in smoking habits, age, bodyweight, level of education, nationality, and the birth year, sex and birth order of the children. Amongst part-time workers in high-exposure environments, the researchers found a 25 percent increase in risk that was not statistically significant. In the medium-exposure group, there was no statistically significant increase in the number of hearing-dysfunction diagnoses, but the possibility of a higher risk there as well cannot be ruled out. The results will be incorporated into the advice given to pregnant women and in the information we distribute to midwives at maternity clinics.

More information: Jenny Selander et al. Maternal Occupational Exposure to Noise during Pregnancy and Hearing Dysfunction in Children: A Nationwide Prospective Cohort Study in Sweden, *Environmental Health Perspectives* (2015). DOI: 10.1289/ehp.1509874

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