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Maternal amalgam dental fillings and mercury exposure in newborn

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Dental amalgam is a mercury-based filling containing approximately 50% of metallic mercury (Hg⁰). Human placenta does not represent a real barrier to the transport of Hg⁰; hence fetal exposure occurs as the result of maternal exposure to Hg, with possible subsequent neurodevelopmental disabilities in infants. The aim of this analysis was to assess the relationship between maternal dental amalgam fillings and exposure of the developing fetus to Hg. The study subjects were mother-child pairs (N=99). Questionnaires were administered after delivery and chemical analyses of Hg were performed in the samples of maternal and cord blood using atomic absorption spectrometry with amalgamation technique.

The mean values of Hg concentrations were 0.79 $\mu\text{g/L}$ (SD_0.49) and 0.86 $\mu\text{g/L}$ (SD_0.46) and the median values were 0.63 $\mu\text{g/L}$ and 0.80 $\mu\text{g/L}$ for maternal and cord blood, respectively. None of the cord blood Hg concentrations reached the level considered hazardous for neurodevelopmental effects in children exposed to Hg in utero (EPA reference concentration for Hg of 5.8 $\mu\text{g/L}$ in cord blood). A strong positive correlation between maternal and cord blood Hg levels was found ($r = 0.79$; $p < 0.001$). Levels of Hg in the cord blood were significantly associated with the number of maternal amalgam fillings ($r = 0.46$, $p < 0.001$) and with years since the last filling ($r = -0.37$, $p < 0.001$); these associations remained significant after adjustment for maternal age and education. Dental amalgam fillings in girls and women of reproductive age should be used with caution, in order to avoid increased prenatal Hg exposure.