

Reproductive toxicity of metals: Critical time of prenatal exposure

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Introduction: Pregnancy is a unique period of women life with an increased sensitivity to toxicants, such as heavy metals. Recently, exposure to potentially toxic metals decreased sharply in both general population and workers but, chronic exposure to low-levels remained a public health problems.

Methods: We have conducted longitudinal studies to estimate effects of prenatal metal exposure on various pregnancy outcomes. Maternal whole blood (taken in the first, second, and third trimester of pregnancy) and umbilical cord blood samples were collected for blood metals measurement using ICP-MS devices. We collected participants' characteristics information and past reproductive and medical history using a structured questionnaire. Data about various pregnancy outcomes gathered during pregnancy and at the delivery.

Result: We found blood metals at the early stage of pregnancy had more significant effects on pregnancy outcomes, such as low birth weight, preterm labor, preterm rupture of the membranes, and pregnancy induced-hypertension than the subsequent trimesters, or in the umbilical cord blood. In addition, the study revealed a high rate passing metals from placenta, which could increase metals level up to twice in fetal site than the maternal blood.

Discussion: The early gestation metal exposure can be induce several adverse pregnancy outcomes. Therefore, the exposure protection or screening programs for the high-level exposure female workers, should be considered before pregnancy or as early as possible, because later intervention may not prevent adverse effects.

Keywords: Metal toxicity, Pregnancy