MATERNAL CADMIUM EXPOSURE IN PREGNANCY AFFECTS SIZE AT BIRTH

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Background and aim: The toxic metal cadmium (Cd), commonly occurring in various foods, is embryotoxic and teratogenic in a variety of animal species, indicating that the prenatal period is a critical window of Cd exposure; however, data in humans is limited. The aim of the present study was to assess the effects of maternal Cd exposure in pregnancy on size at birth.
Methods: This prospective cohort study was nested into a population-based supplementation trial in pregnancy, conducted in rural Bangladesh. We selected all women that were recruited in early pregnancy (Gestational Week (GW) 8) from February 2002-January 2003, and who had singleton births with measurements of birth size (weight, length, head- and chest circumference; n=1616). Urinary Cd (GW 8), a marker of long-term exposure, was measured with ICPMS and adjusted by specific gravity. All women were non-smokers.
Results: Multivariable–adjusted linear regression analyses, controlled for potential confounders including sex, showed that maternal urinary Cd (median: 0.63 µg/L) was negatively associated with birth weight and head circumference. Stratifying by sex showed that the negative association of maternal urinary Cd on size at birth was only apparent amongst girls; birth weight (B=0.45; p=0.020), head- (B=-0.26; p=0.0031), and chest circumference (B=-0.24; p=0.025). We found no significant associations amongst boys. In girls, an increment of 1 µg/L Cd in maternal urine was associated with a decrease in head- and chest circumference by 0.26 and 0.24 cm, respectively and in birth weight by 45g. Multivariable-adjusted quantile regression analyses using the 25th, 50th, and 75th percentiles of size at birth indicated that Cd similarly affected girls of smaller and larger size.
Conclusions: We found a remarkable sex-specific association between maternal Cd exposure and birth size, which was only apparent in girls. Clearly, this has public health relevance and further emphasizes the importance to reduce Cd pollution.