Manganese and selenium concentrations in umbilical cord serum and attention deficit hyperactivity disorder in childhood

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Existing evidence on the effects of manganese and selenium during fetal life on neurodevelopmental disorders is inadequate. This study aims to investigate the hypothesized relationship between fetal exposure to manganese and selenium and attention deficit hyperactivity disorder (ADHD) diagnosis in childhood. Children born between 1978 and 2000 with ADHD (n=166) were identified at the Department of Child and Adolescent Psychiatry in Malmö, Sweden. Controls from the same region (n=166) were selected from the Medical Birth Register and were matched for year of birth and maternal country of birth. Manganese and selenium were measured in umbilical cord serum. The median cord serum concentrations of manganese were 4.3 μg/L in the cases and 4.1 μg/L in the controls. The corresponding concentrations of selenium were 47 and 48 μg/L. When the exposures were analyzed as continuous variables no associations between cord manganese or selenium concentration and ADHD were observed. However, children with selenium concentrations above the 90th percentile had 2.5 times higher odds (95% confidence interval 1.3–5.1) of having ADHD compared to those with concentrations between the 10th and 90th percentiles. There was no significant interaction between manganese and selenium exposure (p=0.08). This study showed no association between manganese concentrations in umbilical cord serum and ADHD. The association between ADHD diagnoses in children with relatively high cord selenium was unexpected and should be interpreted with caution.