

Association between maternal hemoglobin concentration and placental weight to birthweight ratio: the Japan Environment and Children's Study (JECS)

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Abstract

Objective: To evaluate the associations between maternal hemoglobin concentration during pregnancy and placental weight, birthweight, and placental weight to birthweight ratio (PW/BW ratio). Design: A cohort study. Setting: Data from the Japan Environment and Children's Study (JECS). Population: 83 354 singletons born at 28 to 41 weeks of gestational age and their mothers. Methods: The associations between maternal hemoglobin concentration and placental weight, birthweight, and PW/BW ratio were assessed by applying regression analyses with restricted cubic splines. Main outcome measures: Placental weight, birthweight, and PW/BW ratio. Results: Adjusted placental weight and birthweight decreased as hemoglobin concentration increased. The decrease in placental weight was more marked when the hemoglobin concentration was below 12 g/dl; however, the decrease in birthweight was steeper when the hemoglobin concentration was above 12 g/dl. Analysis showed that the PW/BW ratio followed decreasing trend as the hemoglobin concentration increased to 12 g/dl, at which point the ratio changed into increasing trend. Conclusions: We found that placental weight was higher in women with low hemoglobin level during pregnancy than women with normal or elevated hemoglobin level while birthweight of women with elevated hemoglobin level is lower than that of women with normal hemoglobin level. As a result, a U-shaped relationship was found between maternal hemoglobin concentration and PW/BW ratio. Funding: The Japan Environment and Children's Study was funded by the Ministry of the Environment, Japan. Key words: anemia during pregnancy, hemoglobin, Japan Environment and Children's Study, JECS, placental weight

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