



Blood folic acid, vitamin B12, and homocysteine levels in pregnant women with fetal growth restriction

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ABSTRACT. Deficiencies in nutrients such as folic acid and vitamin B12 may play a role in fetal growth restriction (FGR). However, whether folic acid, vitamin B12, or homocysteine is associated with FGR in Chinese populations remains unclear. This study investigated the relationship between these nutrient deficiencies and FGR in pregnant Chinese women. We selected 116 mother and infant pairs, and categorized the neonates into the FGR, appropriate for gestational age, and large for gestational age groups. Birth weight, body length, head circumference, body mass index (BMI), and Rohrer's body index of the newborns were measured. Serum folic acid, vitamin B12, and homocysteine levels were measured in mothers during the first three days of their hospital stay. Results showed that the FGR group exhibited reduced folic acid and vitamin B12 levels and elevated homocysteine levels than those in the other two groups. Folic acid and vitamin B12

levels were positively correlated with birth weight, head circumference, and BMI, whereas homocysteine level was negatively correlated with these variables. The FGR ratio in the folic acid and vitamin B12 deficiency group was higher than that in the sufficiency group ($\chi^2 = 4.717$ and 4.437 , $P = 0.029$ and 0.035 , respectively). In addition, elevated homocysteine was associated with FGR ($\chi^2 = 5.366$, $P = 0.021$). In conclusion, we found that folic acid and vitamin B12 deficiency was associated with elevated homocysteine levels, which may increase susceptibility to FGR.

Key words: Folic acid; Vitamin B12; Fetal growth restriction; Homocysteine