

# Abstract

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## Low plasma vitamin B(12) in pregnancy is associated with gestational 'diabetes' and later diabetes.

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**AIMS/HYPOTHESIS:** This study was designed to test the hypothesis that low plasma vitamin B(12) concentrations combined with high folate concentrations in pregnancy are associated with a higher incidence of **gestational diabetes (GDM)** and later diabetes.

**METHODS:** Women (N = 785) attending the antenatal clinics of one hospital in Mysore, India, had their anthropometry, insulin resistance (homeostasis model assessment-2) and glucose tolerance assessed at 30 weeks' gestation (100 g oral glucose tolerance test; Carpenter-Coustan criteria) and at 5 years after delivery (75 g OGTT; WHO, 1999). Gestational vitamin B(12) and folate concentrations were measured in stored plasma samples.

**RESULTS:** Low vitamin B(12) concentrations (<150 pmol/l, B(12) deficiency) were observed in 43% of women and low folate concentrations (<7 nmol/l) in 4%. B(12)-deficient women had higher body mass index ( $p < 0.001$ ), sum of skinfold thickness ( $p < 0.001$ ), insulin resistance ( $p = 0.02$ ) and a higher incidence of GDM (8.7% vs 4.6%; OR 2.1,  $p = 0.02$ ;  $p = 0.1$  after adjusting for BMI) than non-deficient women. Among B(12)-deficient women, the incidence of GDM increased with folate concentration (5.4%, 10.5%, 10.9% from lowest to highest tertile,  $p = 0.04$ ;  $p$  for interaction = 0.2). Vitamin B(12) deficiency during pregnancy was positively associated with skinfold thickness, insulin resistance ( $p < 0.05$ ) and diabetes prevalence at 5 year follow-up ( $p = 0.009$ ;  $p = 0.008$  after adjusting for BMI). The association with diabetes became non-significant after excluding women with previous GDM ( $p = 0.06$ ).

**CONCLUSIONS/INTERPRETATION:** **Maternal vitamin B(12) deficiency is associated with increased adiposity and, in turn, with insulin resistance and GDM.** Vitamin B(12) deficiency may be an important factor underlying the high risk of 'diabetes' in south Asian Indians.

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