Maternal vitamin D level, glycaemic control and pregnancy outcomes: results from a multi-ethnic population of women with gestational diabetes mellitus in South-Western Sydney


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Abstract

Aim: Vitamin D deficiency has been linked to impaired glucose metabolism. We investigated the relationship between serum 25-hydroxyvitamin D (25[OH]D) and glycaemic control in gestational diabetes mellitus (GDM).

Methods: Retrospective analysis of prospectively collected data (Feb-2011 to Apr-2013) on women diagnosed with GDM by ADIPS criteria: fasting blood glucose level (BGL) ≥5.5 mmol/L and/or 2-hour BGL ≥8.0 mmol/L on 75 g oral glucose tolerance test (oGTT) at 24-28 weeks, with glycated haemoglobin (HbA1c) and 25[OH]D collected shortly thereafter.

Results: A total of 628 women from diverse ethnic backgrounds: (31.4% South-East Asian, 23.4% European, 23.2% Middle Eastern, 15.3% Indian/Pakistani, 6.7% Other), with GDM diagnosed at a mean±SD 24.6±6.1 (range 4-38) weeks gestation. Vitamin D deficiency prevalence (below 2013 ANZBMS guideline target of 50 nmol/L) was high: 48.2% (303 women); degree of deficiency 61%, 34% and 5% for mild (30-49nmol/L), moderate (12.5-29nmol/L) and severe (<12.5nmol/L) respectively. 25[OH]D was negatively associated with fasting BGL (Spearman r = -0.22, p<0.001) and HbA1c (r = -0.20, p<0.001). Women with vitamin D deficiency had statistically significantly higher gravidity, parity, pre-pregnancy BMI, number of GDM risk factors, were more likely to require insulin therapy (39.9% versus 26.8%), and had more LGA babies compared to vitamin D sufficient women. There were no differences in the women’s age, gestation at GDM diagnosis, 2-hour BGL on oGTT, pregnancy weight-gain, gestational age at delivery, caesarean delivery, or oGTT/HbA1c at 6-8 week post-partum follow-up, between vitamin D deficient and sufficient sub-groups.

Conclusion: Our study identified a high prevalence of vitamin D deficiency in a multi-ethnic population of GDM women, and that the vitamin D level was inversely associated with fasting glucose and HbA1c. Apart from greater insulin requirement and more LGA babies, there were no other differences in birth outcomes or follow-up glucose tolerance in the sub-groups of vitamin D deficient or sufficient women. Further exploration of these findings is warranted.

Reference
1. Serum 25-hydroxyvitamin D and glycated haemoglobin levels in women with gestational diabetes mellitus. SL Lau, JE Gunton, NP Athayde, K Byth and NW Cheung. MJA 4 April 2011; 194(7); 334-337.