

**High early pregnancy serum 25-hydroxy vitamin D level, within a sub-optimal range, is associated with gestational diabetes mellitus: a prospective cohort study**

**ABSTRACT**

Background/objectives: Low early pregnancy serum 25-hydroxy vitamin D (25[OH]D) levels can increase gestational diabetes mellitus (GDM) risk, although inconsistent findings related to that association have been reported. This study examined the association of serum vitamin D with GDM and the possible influencers on this association. Subjects/methods: This study included 259 pregnant women within the Seremban Cohort Study (SECOST). Blood samples at < 14 weeks of gestation were drawn to determine serum 25(OH)D levels. GDM diagnosis was made at 24 to 32 weeks of gestation using a standard procedure. Association between serum vitamin D and GDM was tested using binary logistic regression. Results: Nearly all women (90%) had mild (68.3%) or severe (32.2%) vitamin D deficiency (VDD). Non-GDM women with mild VDD had a significantly higher mean vitamin D intake than GDM women with mild VDD ( $t = 2.04$ ,  $p < 0.05$ ). Women with higher early pregnancy serum vitamin D levels had a greater risk of GDM. However, this significant association was only identified among those with a family history of type 2 diabetes mellitus (T2DM) and in women with a body mass index indicating overweight or obese status. Conclusions: The high prevalence of VDD in this sample of pregnant women underscores the need for effective preventive public health strategies. Further investigation of this unexpected association between serum vitamin D level and GDM risk in predominantly VDD pregnant women and the potential effects of adiposity and family history of T2DM on that association is warranted.

**Keyword:** Vitamin D; Body mass index; Gestational diabetes mellitus; Vitamin D deficiency