Prediction of gestational diabetes mellitus in low risk pregnancies by increased maternal serum PLGF and IL-6 concentrations at 11 to 14 weeks of gestation.

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Objective: The aim of this study was to examine serum concentrations of placental growth factor (PLGF) and Interleukin–6 (IL–6) at 11 to 14 gestational weeks in pregnancies that subsequently developed gestational diabetes mellitus (GDM).

Materials and Methods: A case control study including 40 cases of GDM without previous history of GDM and 94 normal controls (C). First trimester PLGF, IL6, biophysical and biochemical markers and maternal–pregnancy characteristics (MP), were analyzed.

Results: log10 transformed PLGF (log10 PLGF) was not related to maternal factors (MF). log10 PLGF was increased (unpaired t – test, p = 0.0085), in the GDM group (mean=1.764047) compared to the C group (mean=1.684283). log PLGF was associated with fasting glucose levels (p=0.04) at the time of oral glucose tolerance test (OGTT). log10 PLGF had a strong relation with birth weight adjusted for gestational age (p=0.002, R²= 0.0989) in the C but not in the GDM group (p=0.692).

Results: IL – 6 was only related to maternal weight (W) amongst the MP characteristics (R² =0.0679, p=0.01). IL -6 was significantly increased (p=0.001) in the GDM group (median=2) compared to the C group (median=1.5) and this association existed after adjustment for W. IL-6 was inversely related to birthweight adjusted for gestational age at delivery (r=-0.3382, p<0.001) and glucose levels at OGTT.

Results: W and maternal age (A) were the only significant predictors of GDM amongst the MF [Detection rate (DR) =59.4%, for 25% False Positive Rate (FPR), Area Under the Curve (AUC)=0.7291, Model R² = 0.1096, p<0.001]. log10 PLGF alone was a significant predictor of GDM [DR =48.6%, for 25% FPR, AUC= 0.6300, Model R² = 0.0374, p<0.001]. Combination of W, A and log10 PLGF resulted in an improved prediction [DR =71.4%, for 25% FPR, AUC=0.7778, Model R² = 0.1698, p<0.001]. IL-6 alone was a significant predictor of GDM (DR =51.3%, for 25% FPR, AUC= 0.6731, Model R² = 0.0616, p<0.001). Combination of W, A and IL-6 yield an improved prediction [DR =67.5%, for 25% FPR, AUC=0.7586, Model R² = 0.1521, p<0.001].

CONCLUSION
1. Women with GDM have increased levels of PLGF and IL–6, at 11 to 14 weeks.
2. PLGF is positively related to birthweight whereas IL – 6 has a negative association with birthweight.
3. A linear association amongst the examined biochemical indices and glucose levels at OGTT was evident.
4. The addition of PLGF and IL -6 improves the performance of screening for GDM provided by maternal factors alone.