Periodontitis and placental growth factor in oral fluids are early pregnancy predictors of gestational diabetes mellitus

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Background: Gestational diabetes mellitus (GDM) affects around 7% to 10% of all pregnancies. Early detection of predisposition to GDM is the first step in developing efficacious preventive treatment. The objective of the present study was to establish the utility of placental proteins presents in oral fluids (gingival crevicular fluid [GCF] and saliva), and periodontal disease status as early pregnancy predictors of GDM. Methods: A nested case control within a prospective cohort was conducted. Pregnant systemically healthy women, aged between 18 and 40 years at 11 to 14 weeks gestation were included. Samples of oral fluids were collected and a complete maternal/obstetric and periodontal history was obtained. The concentration of placental growth factor (PlGF) and soluble Fms-like tyrosine kinase 1 (sFlt-1) were measured by enzyme-linked immunosorbent assay in a nested case control sample of the prospective cohort. Multiple logistic regression models assessed the association. The evaluation of the diagnostic accuracy of the biomarkers was performed through receiver operating characteristic (ROC) curves by calculating the area under the curve (AUC). Results: There were recruited 212 pregnant women at 11 to 14 weeks of pregnancy, of these, 14 women (i.e., 6.6%) developed GDM, and displayed significant greater bleeding on probing

(BOP) [P = 0.0003]; periodontal probing depth (PD) [P = 0.0028]; clinical attachment level (AL) [P = 0.0008] and periodontal inflamed surface area (PISA) [P = 0.0001]. Similarly, initial glycemia and GCF-PlGF concentrations were significantly greater in women with GDM [P = 0.0012, and P = 0.0019, respectively]. When data were subjected to ROC curve analysis, the combination of initial glycemia and GCF-PlGF concentration delivered an area under the ROC curve of 0.897. Multiple logistic regression analyses demonstrate an association between glycemia (OR 1.21, 95% confidence interval [CI] 1.06 to 1.38; P = 0.005) and GCF-PlGF concentrations in women who developed GDM (OR 1.68, CI 1.05 to 2.68 P = 0.03). Conclusions: Within the limitations of the present study, the results support that first trimester maternal glycemia combined with GCF-PlGF concentrations could be a surrogate biomarker for the future development of GDM in pre-symptomatic women.

Diabetes

Gestational

Gingival crevicular fluid

Periodontitis

Placental growth factor

Saliva

Vascular endothelial growth factor receptor-1

biological marker

placenta protein

placental growth factor

vasculotropin receptor 1

adolescent

adult

female

human

periodontitis

preeclampsia

pregnancy

pregnancy diabetes mellitus

prospective study

young adult

Adolescent

Adult

Biomarkers

Diabetes, Gestational

Female

Humans

Periodontitis

Placenta Growth Factor

Pre-Eclampsia

Pregnancy

Pregnancy Proteins

Prospective Studies

Vascular Endothelial Growth Factor Receptor-1

Young Adult