Prediction of Fasting Plasma Glucose with Non-Invasive Salivary Glucose Level and its Correlation on Diabetic Patients Attending Diabetic Centre at Teaching Hospital, Jaffna

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Diagnosis of Diabetes Mellitus (DM) using saliva can be used as an alternative to predict the plasma glucose since saliva collection is non-invasive and associated with fewer compliance problems. This study predicts plasma glucose using salivary glucose and assesses its correlation. Eighty three diabetic patients who attended Diabetic Centre, Teaching Hospital, Jaffna were included in this study. Fasting venous blood and un-stimulated saliva were collected into fluoride-oxalate and sterile plastic container respectively. Salivary glucose level was measured by improvised glucose oxidase-peroxidase method. Correlation and prediction equation were assessed by Pearson's correlation coefficient test. Mean (±SD) plasma and salivary glucose levels were 139.05 mg/dL (±49.62) and 1.02 mg/dL (±0.59) respectively. Plasma and salivary glucose were within the range of 57.04 to 251.43 mg/dL and 0.24 to 2.32 mg/dL respectively. Salivary glucose level was significantly increased with the rise of plasma glucose (Pearson's correlation coefficient = 0.694, $p < 0.0001$; $R^2 = 0.43$). The degree of correlation was higher in females ($r = 0.844$, $p < 0.001$; $R^2 = 0.71$) than that of males ($r = 0.417$, $p = 0.014$; $R^2 = 0.17$). Pearson's correlation coefficients of the sub groups "<126 mg/dL", "126 to 200 mg/dL" and ">200 mg/dL" were 0.33 ($p = 0.033$), 0.49 ($p = 0.009$) and 0.71 ($p = 0.007$) respectively. The prediction equation for plasma glucose using salivary glucose is: Plasma glucose= (100* Salivary glucose+ 1.38)/ 0.73 ($R^2 = 0.430$). Fasting salivary glucose level can be used as a non-invasive diagnostic and monitoring parameter to assess the glycaemic status in DM patients and there is a possibility of predicting plasma glucose from salivary glucose. Further, studies including larger populations from different geographical areas are required to establish saliva instead of blood for diagnosis and monitoring of DM.

Keywords: Salivary glucose, Diabetes mellitus, Correlation, Prediction