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The study of oral findings and salivary biomarkers levels in uncontrolled type 1 diabetic patients

Thesis

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Abstract

Background: Type I diabetes mellitus (type-I DM) is a complex polygenic autoimmune syndrome resulting in the targeted destroy of β -cell in pancreas that result in deficiency or absence of insulin production. Several studies have been reported the salivary biochemical and biomarkers alterations in diabetic patients.

Aims of study: The aims of the study were to evaluate the salivary Interleukin-6 (IL-6), Interleukin-1 Receptor Antagonist (IL-1RA), Secretory Leukocyte Peptidase Inhibitor (SLPI) and matrix metalloproteinase (MMP-2, MMP-8 and MMP-9) in uncontrolled type-I DM, in addition to evaluate of the oral health status (gingival index, pocket depth, attachment loss and DNFT index) with salivary biomarkers and to investigate the association of salivary biomarker to the HbA1c%.

Materials and Methods: The total sample composed of 90 adult aged 18-35 years. Divided into 60 uncontrolled diabetes (HbA1c >7%) and 30 non-diabetic control group. The BMI, HbA1c and duration of disease were recorded through the visit. Unstimulated whole salivary samples were collected from each patient under standardized condition. The salivary flow rate and pH, DMFT index, gingival index, pocket depth and attachment loss were examined by one examiner through visit and the salivary IL-6, IL-1RA, SLPI, MMP-2, MMP-8 and MMP-9 levels were measured by using multiple immunoassay analysis.

Results: The oral health status (gingival index, pocket depth and attachment loss) was significantly higher of type-I DM group than control group, also the Decay Missing Filling Teeth index was highly significant higher among type-I DM group and there was a significant difference between study groups, except the attachment

loss with no significant difference between two groups. The salivary IL-1RA was negatively correlated with gingival index among uncontrolled diabetic group.

The salivary flow rate of uncontrolled type-I DM was highly significantly lower than control group, while the salivary pH among uncontrolled diabetic group was non-significant difference when compared with the control group.

The salivary Matrix Metalloproteinase (MMP-2,-8,-9) and Interleukin-6 (IL-6) were elevated in the individual with type I diabetes mellitus when compared with the healthy controls, but the statistical difference was non-significant between the study groups except for the IL-6 of type-I diabetes mellitus group was significantly higher than the control group.

Concerning salivary MMP-2 of uncontrolled diabetic group was positively correlated with MMP-9; in contrast the correlation between MMP-2 and MMP-8 is negatively correlated.

The salivary IL-1RA was highly significant lower of uncontrolled diabetic group than control group. The salivary SLPI of uncontrolled diabetic group was lower than control group with no statistically significant difference between the two groups. The SLPI was positively highly significant correlated with salivary IL-1RA and positively correlated with salivary MMP-2 and MMP-9; however the statistical significant correlation was found between salivary SLPI and MMP-8 in negative correlation in diabetic group.

The HbA1c showed positively significant correlated with salivary MMP-8 and SLPI parameters; the attachment loss was positively significant correlated with HbA1c% of uncontrolled diabetic group.

Conclusions: The diabetes with poor metabolic control has a significant influence on salivary biomarkers, matrix metalloproteinase and salivary flow rate. The saliva is considered a non-invasive method to detect the inflammatory biomarkers which may be considered an indicator of oral health and glycemic control in type-I diabetes mellitus.