

# ASSOCIATION OF SALIVARY INSULIN WITH FAMILY HISTORY OF TYPE 2 DIABETES MELLITUS AND PERIODONTAL STATUS IN A NORMOGLYCEMIC MALAYSIAN POPULATION



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## Introduction

Hyperinsulinemia governs the predicting factor of T2DM in subjects with a family history of diabetes<sup>1</sup>

Plasma insulin was found to be a potentially promising surrogate marker for insulin resistance

Current evidence indicates the potential use of salivary biomarkers for the diagnosis of metabolic disorders such as T2DM<sup>2</sup>

Periodontal disease is an early sign of diabetes mellitus and may therefore serve as a valuable risk indicator<sup>3</sup>

## Objectives

**To investigate the association of salivary insulin with a family history of T2DM and periodontal status in a normoglycemic Malaysian population**

## Materials and Methods

### 1. Sample selection :

A total of 54 Malaysian subjects 18-65 years old were recruited from IMU Oral Health Clinic

### 2. Inclusion Criteria :

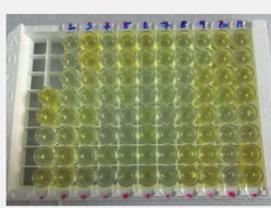
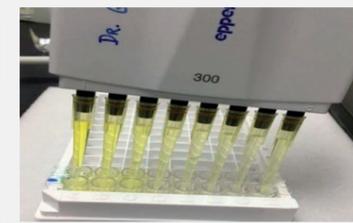
Random blood glucose <5.6mmol/L, HbA1c <5.6%, BMI <27.5kgm<sup>2</sup>, and devoid of any systemic illness

3. Ask subjects about FHx of T2DM and obtain 4ml of whole saliva, stored at -80 degrees Celsius

4. Periodontal status recorded using the Community Periodontal Index of Treatment Needs (CPITN)

5. Concentration of salivary insulin (sINS) was analysed with enzyme-linked immunosorbent assay (ELISA) kits

Score	Criteria
0	Clinically healthy marginal periodontal tissue
1	Gingival bleeding on probing
2	Supra/subgingival calculus
3	Periodontal pockets with depth (4.5mm-5.5mm)
4	Periodontal pockets deeper than 6mm



1. Separation of supernatant aliquot from heavy particles
2. The transfer of enzyme Complex and substrate conjugate for reaction to take place in the wells using micropipettes.
3. Absorbance value measured with UV spectrophotometer.(λ=450nm)

## Results and Discussion

	Subjects with FHx of T2DM	Subjects without FHx of T2DM	P-value
N = ( )	32	22	
Age	36.4 ± 2.4	35.0 ± 2.5	0.76
BMI	23.22 ± 2.76	23.17 ± 2.54	0.35
Gender	Male – 8 (25%) Female – 24 (75%)	Male – 7 (32%) Female – 15 (68%)	0.59
Race	Malay – 7 Chinese – 17 Indian – 7	Malay – 3 Chinese – 12 Indian – 7	0.47
CPITN			
0	4	3	0.42
1	15	6	
2	10	10	
3	3	0	
4	0	3	

- Subjects with FHx of T2DM and without FHx of T2DM are of similar age and BMI group.
- Periodontal status is not significantly correlated with FHx of T2DM.

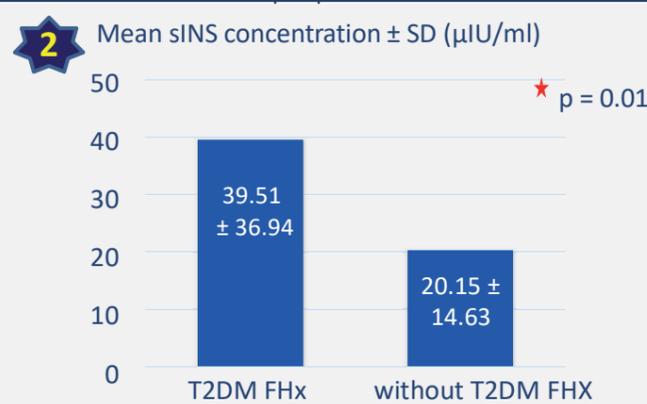
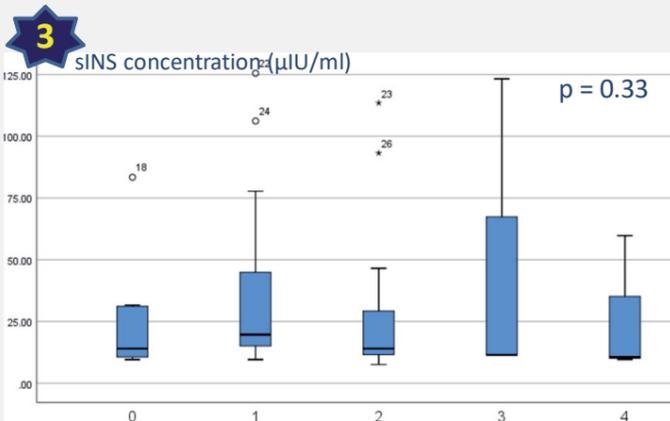


Fig 1: Comparison of concentration of salivary insulin (µU/ml) in group with and without FHx of T2DM.



- The mean sINS concentration was significantly higher in subjects with FHx of T2DM compared to those without FHx
- Therefore similar trends of changes in insulin observed in plasma are also observed in saliva

- Periodontal status is not significantly correlated with sINS concentration.
- sINS level is independent of periodontal status

Fig 2 : Comparison of concentration of salivary insulin (µU/ml) with CPITN scores.

## Conclusion

**Salivary insulin was associated with a family history of T2DM but not periodontal disease. Thus, salivary insulin can be a potential non-invasive marker for T2DM risk that is independent of periodontal status.**

## References

- 1.Rahim M, Rahim M, Qureshi MA, Sharafat S, Shaikh Z, Rahim MA. Serum insulin and insulin resistance in the offsprings of type 2 diabetes mellitus. J Diabetes Metab. 2014;5:425.
2. Srinivasan M, Blackburn C, Mohamed M, Sivagami AV, Blum J. Literature-Based Discovery of Salivary Biomarkers for Type 2 Diabetes Mellitus.
- 3.Teuw WJ, Kosho MX, Poland DC, Gerdes VE, Loos BG. Periodontitis as a possible early sign of diabetes mellitus. BMJ Open Diabetes Research and Care. 2017 Jan 1;5(1):e000326.