

INTRODUCTION

- Saliva has many diagnostic uses and is useful in screening for various diseases and epidemiologic studies.
- Saliva mainly consists of water, essential electrolytes, glucose, amylase, glycoproteins, and antimicrobial enzymes.
- The majority of molecules present in blood or urine can also be detected in salivary secretions but in a very small amount than those found in blood.
- Saliva can be useful in the estimation of glycemic control in patients with diabetes.
- Basement membrane permeability of the parotid gland is reported to be higher in diabetes mellitus, and it results in increased percolation of components such as glucose, amylase and protein from blood occur due to increased permeability of the basement membrane of the parotid gland. Due to this glucose level in saliva increases.

METHODS & MATERIAL

- The study is conducted after necessary ethical approvals. In the study group, 50 diabetic patients and 50 healthy subjects were selected randomly.
- Patients with well-established cases of all types of diabetes mellitus were included in the research as per standard guidelines.
- For healthy control, non-diabetic patients with normal blood glucose levels were selected. Patients with pregnancy or any other systemic diseases were excluded.
- Diabetic patients were divided into different groups based on HBA1c levels.

GROUPS	HBA1c (%)
Normal (Healthy Patients)	< 5.6%
Good Control (Diabetic Patients)	5.6% - 5.9%
Pre-diabetes (Diabetic Patients)	6.0% - 6.4%
Poor Control (Diabetic Patients)	6.5% - 7%
Very Poor control (Diabetic Patients)	≥ 7%

- Serum and salivary glucose were assessed by the use of an enzymatic colorimetric test kit, by the GOD-POD method (Glucose Kit, Erba Mannheim, Trinder's Method).
- HBA1c is analyzed using the Immunoturbidimetric method.
- Both diabetic and healthy study participants submitted average plasma glucose and salivary glucose samples, which were then statistically analyzed using SPSS software.

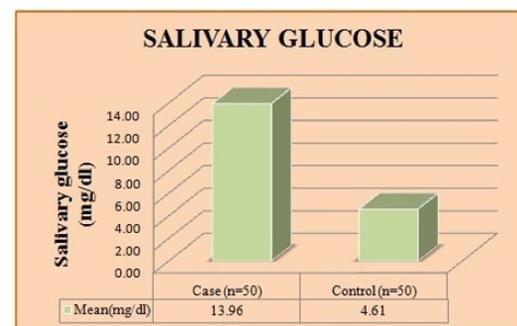
RESULT

- The mean HBA1c in the diabetic patient group is 8.07 ± 1.98 is higher than mean HBA1c in healthy patient group is 4.48 ± 0.74 .
- Similarly, the mean salivary glucose was higher in the diabetic patient group (13.96 ± 7.09 mg/dl) than in healthy patients (4.61 ± 2.58 mg/dl).
- As the value of HBA1c increase mean salivary glucose level increase in Diabetic patients.
- From the study, we have tried to predict the values of average plasma glucose, HBA1c, for a given salivary glucose by using following the regression equations in diabetic patients

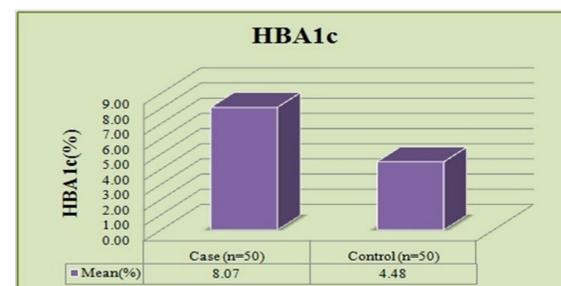
$$\text{HBA1c} = 0.256 \times \text{Salivary glucose} + 4.499 \quad (R^2 = 0.843)$$
- Pearson's correlations coefficient and Independent 2-tailed test showed that there were very high positive correlations of HBA1c with Salivary glucose in a diabetic patient.
- P value is <0.0001 which indicates a very high positive correlation between HbA1c and salivary glucose levels.

RESULT

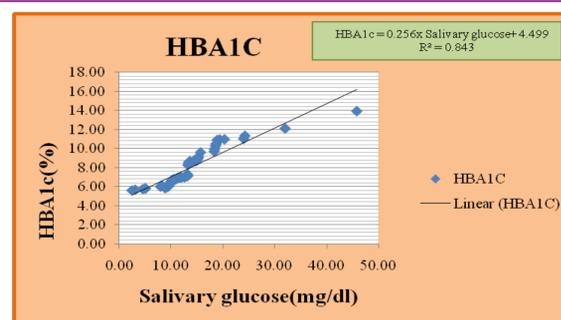
	Group	N	Mean	Std. Deviation	Std. Error Mean	Mean Difference	P Value	Result
HBA1C (%)	Diabetic pts	50	8.07	1.98	0.28	3.59	<0.0001	S
	Healthy pts	50	4.48	0.74	0.10			
	Healthy pts	50	88.84	22.86	3.23			
SALIVARY GLUCOSE (mg/dl)	Diabetic pts	50	13.96	7.09	1.00	9.35	<0.0001	S
	Healthy pts	50	4.61	2.58	0.37			



Graph 1: Correlation of mean salivary glucose level in Diabetic patients and Healthy Controls



Graph 2: Correlation of mean HBA1c level in Diabetic patients and Healthy controls



Graph 3: Correlation between Salivary glucose and HBA1c in Diabetic patients

GROUP	HBA1C (%)	MEAN HBA1C	MEAN SALIVARY GLUCOSE(mg/dl)	CORRELATION	P VALUE	N
Normal range (Healthy patients)	< 5.6 %	4.48	4.61	0.855	<0.0001	50
Good Control (Diabetic Patients)	5.6 - 6.0 %	5.79	5.53	0.910	0.004	7
Pre diabetes (Diabetic Patients)	6.0 - 6.5 %	6.18	9.05	0.910	0.032	5
Poor Control (Diabetic Patient)	6.5 - 7%	6.89	11.41	0.922	<0.0001	9
Very Poor Control (Diabetic Patients)	≥ 7 %	9.32	17.63	0.879	<0.0001	29

CONCLUSION

- We found increased Salivary glucose levels in patients having diabetes mellitus. Salivary glucose level can be used as a monitoring tool to assess the glycemic status of diabetes mellitus patients as it is non-invasive, and diagnostic compared to other fluids.
- Further studies with larger populations in different geographic areas are needed to establish salivary glucose estimation as an excellent diagnostic as well as a monitoring tool for diabetes mellitus.