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Original Article

Gingival Crevicular Blood as an Early Indicator of Elevated Systemic Blood Glucose Levels in Diabetic Patients in Dental Practice- Original Research

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***ABSTRACT*:**
Introduction: Dentist can play a important role in screening of many systemic diseases through Oral health of the patient. Early diagnosis of any systemic diseases can prevent long-term complications. Diabetic is one of the common chronic diseases. Hence, the study had been undertaken to evaluate whether gingival crevicular blood (GCB) can be used to screen for diabetes during routine oral health checkups. **Materials And Methods:** This analytical study included sixty participants, out of which 30 are diabetic and 30 are non-diabetic who visited Dr Som's Dental Clinic, Jammu and were willing to participate. Blood samples were collected by finger stick method and periodontal probing. The glucose levels of both the samples were estimated using glucometer and correlated the levels from both the methods. **Results:** Correlation between capillary finger stick blood glucose and GCB glucose was high (0.98) and was significant at 0.001 level. **Conclusion:** Blood oozing during routine periodontal examination can be used for diabetes mellitus screening in dental office.
Key words: Gingival crevicular blood , Diabetes mellitus, glucometer.

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INTRODUCTION

Diabetes mellitus is pandemic disease affecting population worldwide, common among Indians where 62.4 million population is affected with this disease and every fifth diabetic in the world is an Indian.[1,2]

The early detection of subclinical disease by advanced screening procedures is making considerable progress in the field of preventive medicine to reduce the nonstop progression of certain chronic diseases. Diabetes mellitus is undiagnosed in approximately 1/2 of the patients actually suffering from the disease. The prevalence of DM patients is more than 2 times as high in patients with periodontitis when compared to periodontally healthy patients.[3]

The ability to collect gingival crevicular blood (GCB) for glucose measurement using readily available glucometers that measure glucose in a few seconds seems to be a good method of screening diabetic Patients. So, the aim of our study is to evaluate the authenticity of use of gingival crevicular blood as an early indicator of elevated systemic blood glucose levels in diabetes mellitus patients.[4]

MATERIALS AND METHODS

Sixty participants visiting the som's dental hospital jammu, were examined. The duration of the study was 1 month . Patients aged 35 years and above with untreated moderate-to-severe periodontitis with adequate bleeding on probing, who were previously undiagnosed as diabetic, were included in the study. Participants with bleeding disorder, those taking any medication, those with any systemic disease, and suppuration in the anteriors were excluded from the study. After briefing on the procedure, Participants gave their written consent for participation.

Collection of GCB and CFB

Maxillary anterior region was preferred for the collection of GCB sample for ease of access. The area was isolated with cotton rolls to prevent saliva contamination and dried with compressed air. For participants with inadequate bleeding on probing, probing was repeated, when necessary, until a sufficient quantity of blood was present to gather sample.[5,6]

Pasteur pipette was used for collection of GCB sample which was then transferred to test strip attached to self-monitoring glucometer (Ascensia Entrust Diabetes Care System). Immediately, a capillary finger-stick blood (CFB) sample was drawn from the patient's ring finger.

The pad of the finger was initially wiped with alcohol swab, which was then allowed to dry and then punctured with a sterile lancet. Then, this blood sample was transferred to the test strip. The CFB readings were regarded as "casual" because they were taken without regard to the time since the patients last ate.[7,8]

RESULTS

Sixty patients participated in the study (30 females and 30 males).

For the diabetic group, the blood glucose levels were in the range of 90–256 mg/dl, with a mean of 156.62±27.42 mg/dl. For the non-diabetic group, blood glucose levels were in the range of 76–122 mg/dl, with mean of 86.12±20.10 mg/dl (Table 1).

Table 1- Mean value of diabetic and non-diabetic patients

	GCB (Mean + Std)	Finger blood (Mean + Std)	P value
Diabetic (n=30)	156.62±27.42	209.75± 27.78	0.001
Non diabetic (n=30)	86.12±20.10	98.93±25.90	0.01

The percentage of males was 50% (n = 30) and the percentage of females was 50% (n = 30). The mean age group of the study participants was 45.73 ± 7.25 years, and the ranges of readings obtained were between 74 and 301 mg/dl. The maximum difference between capillary and crevicular blood glucose level was 18 mg/dl. The results showed a strong correlation ($r = 0.98$, $P < 0.01$) between GCBG and CFBG glucose in case of diabetic and non-diabetic patients. [Table 1].

DISCUSSION

Diabetes mellitus has long been considered to be one of the systemic condition as diabeties is an additional and important factors that influence the relative risk for periodontal diseases.[9]

Glucometer is commonly used by diabetic patients for home monitoring of their blood glucose levels using a single drop of blood from a finger stick. This procedure is of interest to the dental practitioner since it is simple, relatively inexpensive, and of sufficient accuracy to serve as an in-office screening device for patients suspected to have diabetes. So, dental practitioner can also do the diabetes screening of the patients with the periodontitis and are suspeced of diabetes in the day to day practice.[10-13]

Since periodontal inflammation with or without the complicating factor of diabetes mellitus is known to produce ample extravasate of blood during diagnostic periodontal examination, no extra procedure, for example, finger puncture with a sharp lancet is necessary to obtain blood for glucometric analysis.[14]

The strong correlation obtained in the present study on comparison between the various blood glucose measurements indicates the feasibility of using periodontal sulcular blood as an alternative to the FP blood in accordance to the previous studies. On analysis of our study, finger prick capillary blood glucose showed a slightly higher mean value than gingival crevicular blood glucose mean value, may be due to contamination of GCF which dilutes the glucose concentration producing lower measurements in GCB.

CONCLUSION

Within the limitations of this study, the following conclusion can be made that GCB collected during diagnostic periodontal examination may be an excellent source of blood for glucometric analysis. The results suggest that the GCB is one of the earliest sources for screening diabetes mellitus in dental office but not as an alternative to standard aids.

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