

Estimation of Alteration in Gingival Basement Membrane in Patients with Diabetes Mellitus

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ABSTRACT

Background: Diabetes mellitus commonly known as diabetes in general terms. It is a disease of uncontrolled blood sugar levels. The classic signs and symptoms of diabetes mellitus include the triad of frequent urination (polyuria), increased thirst (polydipsia), and Increased hunger (polyphagia) along with weakness and fatigue. Diabetes is often related to alteration of gingival basement membrane.

Materials & Methods: The gingival biopsy was obtained from the interdental papilla of a tooth distal to second premolar. It was then fixed in formalin and immediately carried to laboratory. Histological were made of thickness of 5 microns and dyed with hematoxylin and eosin, and PAS. Then it was place under light microscope.

Results: This study clearly shows the increase in incidence of basement membrane alteration. Sixty four percent of the patients showed mild mild changes in the basement membrane. Twenty-five percent showed moderate alterations, while ten percent showed severe alterations in basement membrane.

Conclusion: This research stated that arteriosclerosis is increased in the diabetic patients. Further studies with larger group of patients are required for detailed evaluation.

Keywords: Basement membrane, diabetes mellitus, gingiva.

INTRODUCTION

Diabetes mellitus commonly known as diabetes in general terms. It is a disease of uncontrolled blood sugar levels.¹ There are two types of diabetes, type I and type II. Type 1 and 2 DM are the main subtypes, each with different presentation, and management, but both have a potential for hyperglycemia.² This activity outlines the pathophysiology, evaluation, and management of DM and highlights the role of the interprofessional team in managing patients with this condition.

The classic signs and symptoms of diabetes mellitus include the triad of frequent urination (polyuria), increased thirst (polydipsia), and Increased hunger

(polyphagia) along with weakness and fatigue.³ Diabetes alters the gingival health of the patients. Various studies have found significant abnormalities in gingival tissue in patients suffering from DM.^{4,5}

A striking feature were PAS positive, thickening of the vessel walls, and proliferation of endothelial cells which in many cases produced luminal obliteration.⁶⁻⁸ Dentist should suspect diabetes first after seeing these changes.

In view of these findings, it was deemed important that a study should be carried out which could make

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the PAS staining, a routine method to study the thickening of blood vessels for evaluation of underlying diabetic conditions in routine biopsy specimen.^{9,10} This could seriously modify the routine procedures carried out in dentistry.

MATERIALS AND METHODS

Hundred Patients were selected from the out-patient department of our institute. All the patients were explained in details of the study and a written consent were obtained. All the ethical clearances were obtained from the ethical review board for the institute (ERW/OMR/2019/234). Patients who were suffering from diabetic mellitus and in age group of 40 to 60 years were selected for the study. Patients with recent history any surgery and/or on antibiotic therapy was excluded from the study. The gingival biopsy was obtained from the interdental papilla of a tooth distal to second premolar. It was then fixed in formalin and immediately carried to laboratory. Histological were made of thickness of 5 microns and dyed with hematoxylin and eosin, and PAS. Then it was place under light microscope. All the fixing of biopsy was done with single technician and was observed by single pathologist to reduce the intralaminar bias.

RESULTS

	Suspicious	Mild	Moderate	Severe
No of Patients	1	64	25	10
Percentage	1%	64%	25%	10%

This study clearly shows the increase in incidence of basement membrane alteration. Sixty four percent of the patients showed mild mild changes in the basement membrane. Twenty-five percent showed moderate alterations, while ten percent showed severe alterations in basement membrane. However in one percent cases the results were unknown.

DISCUSSION

The present study showed that basement membrane tends to get altered in the patients with DM. It also revealed that there is continuous change of basement membrane with relation to the intensity of stain, and increase in width of basement membrane.^{11,12} It also showed basement membrane irregularity and swollen endothelial cells.^{13,14} The

above results were obtained by the use of PAS and Diastase staining. The four parameters were related to both structural changes and functional changes.¹⁵⁻¹⁸ The structural changes consisted of thickening of basement membrane and functional changes included increased intravascular pressure and enhanced vascular leaking.^{19,20} The functional changes such as increased blood flow and vascular permeability occurs long before any structural changes are evident.

Pre capillary resistance is reduced which increases the flow through the capillary belt.²¹ This results in a greater tangential stress on the endothelial cells. This will also change endothelial charge characteristic leading to increased permeability. This creates duplication and irregularities in the endothelium and basement membrane which can be seen under microscope.

CONCLUSION

Diabetes mellitus has a long history but still it is far from over. There is lack of definitive treatment protocols. It also brings lot of complication in the body of the sufferer. This research stated that arteriosclerosis is increased in the diabetic patients. Further studies with larger group of patients are required for detailed evaluation.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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