

DIABETES IN PATIENTS WITH POSITIVE FAMILIAL HISTORY VISITING ORTHODONTIC DEPARTMENT, NISHTAR INSTITUTE OF DENTISTRY

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ABSTRACT

Background: Diabetes mellitus is one of the most commonly prevailing diseases. A positive family history is a strong risk factor for this disease. Diabetes has many oral manifestations, the most common of which is periodontal loss.

Objective: The aim of our study is to determine the frequency of diabetes with a positive familial history in orthodontic patients.

Methods: This cross-sectional study was conducted in one year period. We selected 110 patients coming to the Orthodontic Department of Nishtar Institute of Dentistry, during June 2017 to May 2018, with a positive family history of diabetes mellitus. The age ranged from 8-30 years. Written consent was taken to check their blood glucose level and the random blood sugar was checked on a glucometer. The Statistical Package for Social Sciences (SPSS) software version 20 was used for data evaluation and analysis. All the measurements from the 110 samples were recorded in a tabulated form. The results were established and frequency for disease and risk was calculated.

Results: Out of 110 patients who had family history of diabetes, 12 patients had diabetes mellitus, 5 of which had a family history of both the parents suffering from diabetes and 7 whose single parent was suffering from diabetes. There was a 5.83 times greater chance of developing diabetes in a patient whose both parents were suffering from diabetes than a patient who had a single diabetic parent.

Conclusion: Every orthodontic patient with family history of diabetes should be screened for diabetes.

Keywords: Diabetes mellitus, Family history, Orthodontic treatment

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INTRODUCTION

Diabetes mellitus is the most common endocrinological disorder. In Pakistan it's a chronic health problem affecting both genders¹. It is characterized by dysfunction of glucose metabolism due to pancreatic beta cell destruction, inadequate insulin secretion, insulin resistance, or combination of one or more of these

mechanisms. Diabetes type 1 (Insulin dependent diabetes), type 2 (non-insulin dependent diabetes) are major public health concerns²⁻³. The oral symptoms of diabetes include mouth dryness, dental caries, oral candidiasis, delayed healing and recurrent infections⁴⁻⁶. Diabetes also destroys periodontal tissues leading to gingivitis, periodontitis, malalignment, proclination and spacing of teeth, mobility and ultimately tooth loss⁷. Almost 6% of the world population suffers from diabetes. As periodontium is an important element in orthodontic tooth movement, healthy periodontium is needed. Periodontitis will increase the risk of unpredictable orthodontic movement of teeth. Orthodontic band and separators placement may produce significant bacteremia

leading to frequent infections⁸⁻⁹. The rapid progression of alveolar bone loss in patients with diabetes is well recognized. While history taking, we came to know that patients frequently have family history of diabetes. So these patients are more prone to develop diabetes early or later in their lives as family history is a strong risk factor for developing diabetes. The objective of this study is to find the frequency of diabetes in the orthodontic patients with a positive familial history, so that proper care shall be taken during their orthodontic treatment.

METHODS

This cross-sectional study was conducted in one year period. We selected 110 patients coming to the Orthodontic Department of Nishtar Institute of Dentistry, during June 2017 to May 2018, with a positive family history of diabetes mellitus. Patients who did not have any familial history of diabetes were excluded. The age ranged from 8-30 years. Written consent was taken to check their blood glucose level and the random blood sugar was checked on a glucometer (INST-ANSWER Blood Glucose Monitoring System).

The Statistical Package for Social Sciences (SPSS) software version 20 was used for data evaluation and analysis. All the measurements from the 110 samples were recorded in a tabulated form. The results were established and frequency for disease and risk was calculated.

RESULTS

In our study we found, that out of 110 patients who had family history diabetes, 12 patients had diabetes mellitus, 5 of which had a family history of both the parents suffering from diabetes and 7 whose single parent was suffering from diabetes. We also calculated that patients had a 5.83 times greater chance of developing diabetes whose both parents were suffering from diabetes than a patient who had a single diabetic parent.

Table 1: Diabetes * Family history Crosstabulation

Diabetes (Count)	Family history		Total
	Both parent	Single parent	
No	7	91	98
Yes	5	7	12
Total	12	98	110

Table 2: Family history * Diabetes Crosstabulation

Percentage Within Family history	Diabetes		Total
	No	yes	
Both parent	58.3%	41.7%	100.0%
Single parent	92.9%	7.1%	100.0%
Total	89.1%	10.9%	100.0%

Table 3: Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Family history (both parent / single parent)	.108	.027	.429
For cohort Diabetes = no	.628	.388	1.017
For cohort Diabetes = yes	5.833	2.192	15.522
N of Valid Cases	110		

DISCUSSION

All countries irrespective of their developmental stage are facing an immense burden of diabetes mellitus. A number of cross-sectional studies regarding diabetes mellitus in general population and its effects on orthodontic treatment have given huge information. Different results have been achieved by several authors showing high frequency of diabetes. Patients with positive family history are more prone to diabetes¹⁰⁻¹¹.

According to Susan Hariri et al, family history is a strong risk factor for cardiovascular diseases, cancer and diabetes¹². According to T.P Candler et al, family history is an important risk factor with 84% reporting first and second-degree relatives with type 2 diabetes¹³. Patient with positive history of diabetes express 3 to 4 fold times high risk of development of diabetes. Mothers contribute diabetes more than the fathers and 1st degree relatives are associated with high risk of diabetes¹⁴⁻¹⁵. In our study we found, that out of 110 patients who had family history diabetes, 10.9% patients had diabetes mellitus, 41.7% of which had a family history of both the parents suffering from diabetes and 58.3% whose single parent was suffering from diabetes. We also calculated that patients had a 5.83 times greater chance of developing diabetes whose both parents were suffering from diabetes rather than a patient who had a single diabetic parent.

CONCLUSION

Diabetic control is of great importance during orthodontic treatment. Along with other factors like obesity, stress and sedentary lifestyle, positive family history is one of the major risk factors for diabetes. Patients with family history of diabetes mellitus coming for orthodontic treatment should be screened and managed accordingly. Therefore, orthodontic patient with diabetes should be referred to concerned department for proper management as well as care like good oral hygiene maintenance, bonding instead of banding, use of light forces, repeated scaling and root planning procedures should be carried out during orthodontic treatment

ETHICAL REVIEW BOARD APPROVAL

The study was approved from Ethics Committee of Nishtar Institute of Dentistry, Multan, Pakistan via reference No. 12910/NID.

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AUTHOR'S CONTRIBUTIONS

SK: conceptualization, methodology, investigation, original draft preparation, supervision, and project administration

ZHA: methodology, validation, investigation, and project administration

MIA: methodology, manuscript review and editing, and project administration;

HK: analysis, data curation, manuscript review and editing, and visualization

FA: original draft preparation and methodology