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ORAL HYGIENE PRACTICE AND ORAL MUCOSAL COMPLICATIONS OF DIABETIC AND NON-DIABETIC PATIENTS

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ABSTRACT

Diabetes mellitus is a group of metabolic disorders characterized by abnormal secretion and metabolic action of insulin. It is obviously clear that the oral health and general health is inseparable. Therefore, the aim of this study is to clear up what the diabetic and non-diabetic patients know about diabetes as a disease, oral health behavior and effects of diabetes on oral and general health, and to assess their oral health behaviors, access to dental care and to educate for improved health. This study was performed on males and females of diabetic and non-diabetic patients who attended at private Dental Hospital for oral and dental treatments. The investigators asked the questions verbally in Urdu and filled out the form. The questionnaire included, dental, diabetic and oral hygiene items. A total of 210 (105 patients having the diabetes and 105 patients with non-diabetes) responded the questionnaire. The mean age of the sample was 47.48 (SD 6.96). The mean age of the diabetes patients was 46.8 (SD 7.05) and non-diabetes was 48.06 (SD 6.85). The age range of the sample was 29 to 65. There were 41% female and 59% male patients. The survey showed that in our environment the oral health awareness, practice and status of patients with diabetes was poor. Both diabetic and non-diabetic groups lacked in knowledge regarding oral health.

Keywords: *Awareness, Diabetes, Knowledge, Oral Health*

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INTRODUCTION

Diabetes mellitus is a metabolic disorder presenting with hyperglycemia and glucose intolerance occur due to deficiency of insulin or malfunctioning of insulin action.[1] Diabetic nephropathy, retinopathy, coronary heart disease, strokes and delayed wound healing are the major consequences that occur in chronic and uncontrolled diabetic patients.[2]

According to the estimate by the World health Organization, there are almost 422 million diabetic mellitus patients who were aged above 18 were present worldwide in 2014.[3] It's considered as a public health issue since the late twenty century[4] and its prevalence increased significantly in low and middle income countries than higher income country over the last decade.[5]

Periodontitis which is two to three times more in diabetic patients than individual with a normal glucose level[6], the other most common oral manifestations that are associated with diabetes mellitus are gingivitis, tooth loss, burning mouth sensation, taste alteration and hyposalivation.[7] Decreased production of saliva from the salivary glands reduces the cleansing ability of the oral cavity that leads to dry mouth, which subsequently increases the rate of plaque accumulation on the tooth and gingival surfaces that consequently increases the risk of development of dental caries, gingivitis and periodontitis.[8] Several studies show that dry mouth is the most common oral manifestation in diabetic patients.[9]

Oral hygiene practice such as frequent brushing, using dental floss and periodic dental visits have a

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positive effect on periodontal health and improve the patient's glycemic control.[6] Dental setups are a favorable place for diabetes screening where patients visit for their periodic dental examination and treatment. It has been found that there is a scarcity of knowledge among diabetes patients regarding the consequences of diabetes and oral complications.[10] The research would help the health care providers in intervention, improving and providing oral health education in both the diabetic and non-diabetic patients, in turn controlling diabetes and, ultimately, improving quality of life. The purpose of the study was to assess the oral complications among diabetic patients and non-diabetic individuals and also assess their knowledge and practice of oral.

METHODOLOGY

The questionnaire based cross sectional study was conducted in diabetic patients and non-diabetic individual visiting Outpatient Department of private teaching hospital during the period of November 2017 and December 2017. Due to the scarcity of research duration, convenience sample technique was used to enroll the study participants, equal number of participants were enrolled in two groups, and 105 patients with diabetic and 105 individuals without history of diabetics were included in the research. Inclusion criteria was set to the age above 18 years. Pregnancy induced diabetes in females excluded from the research. Self-structured questionnaire devised from the previous published articles and variables of interest were added to comprise a questionnaire that consists of information of participants age, gender, knowledge of diabetes i.e. the effects of diabetes on general health, effects of diabetes on oral cavity, brushing habit, brushing frequency, patients self-perceived history of bleeding gum during brushing, smoking habit, ever visited to dentist and patient interest in getting information for effects of diabetes on general health and oral health. Questions based on patient's history of dry mouth, burning mouth sensation and change in taste alteration were also included in the questionnaire. Data from each participant was collected by face to face interview by the professional dentists. The investigators asked the questions verbally in Urdu and filled out the form. Ethical approval was obtained from the ethical board of University. Consents was obtained and assure the patients confidentiality of the study results.

Statistical analysis was performed by computing descriptive statistics of the data.

Mean and standard deviation were performed for age, frequency and percentage was used for categorical variables. Chi square test was used to analyze the difference of knowledge among diabetes and non-diabetes dental patients. Statistical Package for Social Sciences (SPSS) version 20 used for data entry and statistical analysis.

RESULTS

A total of 210 participants (105 patients having the diabetes and 105 patients with non-diabetes) were approached for the questionnaire to be filled. The mean age of the sample was 47.48 (Standard deviation 6.96). The mean age of the diabetes patients was 46.8 (SD 7.05) and non-diabetes was 48.06 (SD 6.85). The age range of the sample was 29 to 65. There were 86 (41%) female and 124 (59%) male patients.

As shown in table 1, the dry mouth, burning mouth sensation and taste alteration were higher in diabetes patients than non- diabetic patients and the differences observed in these two groups were statistically significant and the p value was less than 0.01.

The difference regarding oral health knowledge and practices among diabetic and non-diabetic patients presented in table 2.

DISCUSSION

TABLE 1: DIFFERENCES OF ORAL SYMPTOMS AMONG DIABETIC AND NON-DIABETIC PATIENTS

Oral symptoms	Dental patients with Diabetes N=105	Dental patients without Non-diabetic N=105	Total 210	P-value
Dry mouth				
Yes	50(47.6%)	22(21.0)	72(34.3%)	<0.01
No	55(52.4%)	83(79.0%)	138(65.7%)	
Burning mouth sensation				
Yes	57(54.3%)	21(20.0%)	78(37.1%)	<0.01
No	48(45.7%)	84(80.0%)	132(62.9%)	
Taste alteration				
Yes	66(62.9%)	22(21.0%)	88(41.9%)	<0.01
No	39(37.1%)	83(79.0%)	122(58.1%)	

TABLE 2: KNOWLEDGE AND PRACTICE REGARDING ORAL HYGIENE AMONG DIABETIC AND NON-DIABETIC PATIENTS

Variables	Dental patients with Diabetes N=105	Dental patients without Non diabetic N=105	Total 210	P-value
Diabetes effect on oral health				
Yes	18(17.1)	10 (9.5)	28 (13.3)	NS
no	80 (76.2)	85 (81.0)	165 (78.6)	
may be	7(6.7)	10 (9.5)	17(8.1)	
Brush your teeth regularly				
Yes	73(69.5%)	43 (41.0%)	116(55.2%)	< 0.01
No	32(30.5%)	62 (59.0%)	94(44.8%)	
How often brush teeth				
Once a day	69 (65.7%)	59(56.2%)	128(61.0%)	NS
Twice a day	30(28.6%)	44(41.9%)	74(35.2%)	
Once a week	6(5.7%)	2(1.9%)	8(3.8%)	
Bleeding during brushing				
Yes	53(50.5%)	46(43.8%)	99(47.1%)	NS
No	46(43.8%)	56(53.3%)	102(48.6%)	
sometimes	6(5.7%)	3(2.9%)	9(4.3%)	
Diabetes cause dental caries				
Yes	23 (21.9%)	14(13.3%)	37(17.6%)	NS
No	74(70.5%)	85(81.0%)	159(75.7%)	
May be	8(7.6%)	6(5.7%)	14(6.7%)	
Diabetes effect gingiva				
Yes	21(20.0%)	18(17.1%)	39(18.6%)	NS
No	84(80.0%)	87(82.9%)	171(81.4%)	
Learn information of diabetes from any source				
Yes	36(34.3%)	19(18.1%)	55(26.2%)	< 0.05
No	69(65.7%)	86(81.9%)	155(73.8%)	
Ever visited dentist for examination				
Yes	43(41.0%)	46(43.8%)	89(42.4%)	NS
No	62(59.0%)	59(56.2%)	121(57.6%)	
Smoke cigarette				
Yes	46(43.8%)	40(38.1%)	86(41.0%)	NS
No	56(53.3%)	63(60.0%)	119(56.7%)	
Sometimes	3(2.9%)	2(1.9%)	5(2.4%)	

The data from diabetic and non-diabetic group showed that both groups were deficient in knowledge regarding the general oral health. Researches that were done on diabetic patients regarding the knowledge and awareness of oral hygiene maintenance revealed that diabetic patients were deficient in this domain. [11,12]

The study revealed that 47% of the diabetic patients had dry mouth and the result was statistically significant difference among these two groups. In another studies, where the findings were in favor of our results, it was found out that 43% and 65% of the diabetic patients complained of dry mouth and it's observed that dryness was the common complaint among the diabetes patients due to lower salivary flow.[13,14] Diabetes and dryness of mouth association was also reported in other studies.[15] In another study, done among the diabetic patients, results were contrast from our study, where the 5.3% patients reported dry mouth.[16] BMS is a chronic pain syndrome, it's reported in association with systemic diseases such as diabetes mellitus and post-menopausal women.[17] In our study there were 54% participants had BMS among the diabetic group and 62.9% participants had taste impairments among the diabetic group. In another study the results were contrast from our study where the prevalence of BMS and taste alteration was 10% and 20% respectively.[18] In another study, taste alteration was 28% and 44%, BMS was 32% and 24% in controlled and uncontrolled diabetic patients respectively.[19]

In this research, only 13.3% participants responded that diabetes had effect on oral health among them, diabetic group replied with 17.1% and non-diabetic group replied with 9.5%. Results from the qualitative research done on diabetic patients revealed that only 6% of the study participant were aware that diabetes mellitus associated with oral complications.[20] The results were contrast to the results done among the study done in diabetes patients in another study where the result was 76%.[21] Lower knowledge reflects that diabetic participants could have low education or unemployment regarding the oral aspect of diabetes.

Overall prevalence of tooth brushing in the study participants was 55%. In the research, prevalence of tooth brushing was 69.5 % in diabetic patients and 28.6% diabetic participants brush their teeth twice, similarly in another study done on diabetic patients where the prevalence of tooth brushing was 89% and frequency of brushing twice a day was 38% among the diabetic patients.[22] In another study 50% of the study participants brush their teeth regular and 31% respondents brush their teeth twice.[23] In order to maintain proper oral hygiene and prevention from dental caries and periodontitis, tooth brushing is considered as the primary tool for removing plaque from the tooth surface.[24] In our research, 47.1% study participants noticed bleeding gums while tooth brushing, these results were almost similar to another study which was done in Jordanians where the prevalence of bleeding gums was 60.7%.[12] Regarding the information of dental caries, 17.6% of the study participants believed that diabetes can cause tooth decay. However the information among diabetes and non-diabetes group was non-significant. Similarly 18.6% reported that diabetes effects gingival tissue. Inadequate knowledge of oral hygiene was also reported in another study.[25] Diabetes patients are vulnerable to dental caries due to hyposalivation[26] that consequently causes dryness of mouth, which is considers as a risk factor for dental caries and prevalence of gingival disease was prevalent among diabetic patients.[27] Diabetes mellitus consider as the risk factor for gingivitis and periodontitis.[28]

CONCLUSION

The results of the study showed that both diabetic and non-diabetic groups were deficient of knowledge regarding the effects of diabetes mellitus on oral cavity. Another important finding of the present study is that the diabetic group reported symptoms i.e. dry mouth, burning mouth sensation and taste alteration which were in higher numbers than non-diabetic group. General physicians and oral physicians should give special concerns to diabetic patients. Early diagnostic, treatment and providing information related to the effects of diabetes on general and oral health can alleviate the diseases and mitigate the diabetic complications.

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