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Oral Manifestations of Diabetes Mellitus in Patients Receiving Care at the Out-Patient Department of the University of Uyo Teaching Hospital

Onung Samuel[1, *], Akhimienho Kingsley[2], Nwashindi Arthur[3], Ogbode Sylvester[3], Ekanem Anyiekere[4]

[1]Endocrinology, Diabetes and Metabolism Unit, Department of Internal Medicine, University of Uyo Teaching Hospital, Uyo, Nigeria

[2]Department of Paediatrics, Edo State University, Uzairue, Nigeria

[3]Department of Dental and Maxilofacial Surgery, University of Uyo Teaching Hospital, Uyo, Nigeria

[4]Department of Community Medicine, University of Uyo Teaching Hospital, Uyo, Nigeria

Email address:

dronungson@yahoo.com (O. Samuel), irelosenkingsley@yahoo.com (A. Kingsley), drart77@yahoo.com (N. Arthur), dramekanem@yahoo.com (E. Anyiekere), drogbode@yahoo.com (O. Sylvester)

[*]Corresponding author

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Abstract: Diabetes mellitus is known to affect virtually every system of the human body including the oral cavity. The effect of diabetes on the oral cavity is well documented globally but underreported in Nigeria. Hence, this study attempted to fill this gap in knowledge by evaluating the pattern of oral changes among persons living with diabetes in Uyo, Southern Nigeria. Methods: This was a crossectional descriptive study conducted in the Endocrinology and Dental clinics of the University of Uyo Teaching Hospital. A total of 150 participants consisting of 100 diabetes patients and 50 controls were interviewed orally, physically examined and blood samples taken for fasting plasma glucose and glycated haemoglobin. Data obtained was analysed using descriptive/comparative statistics. Results: Poor oral health was present in 98 out of the 100 diabetes Patients and 11 out of the 50 controls ($p < 0.001$). Gingivitis was present in 96 out of the 100 diabetes patients and 4 out of the 50 controls ($p < 0.001$). Periodontitis was found in 51 out of the 100 diabetes patients and absent in the controls ($p < 0.001$). Mean HbA1c of the diabetes patients with poor oral health was 7.65 +/- 0.94. Diabetics were 62.34 times significantly more likely to have poor oral health compared to the controls (OR 62.34, 95%CI = 1.45-2668.94, $p = 0.03$). Conclusion: Oral health of diabetes patients in Uyo, Southern Nigeria is poor with periodontal disease being the predominant abnormality present. Poor glycaemic control was implicated as a likely reason for this finding.

Keywords: Oral, Manifestation, Diabetes Mellitus, Uyo

1. Introduction

Diabetes mellitus (DM) is a metabolic disorder of global public health importance [1, 2]. It is characterized by chronic hyperglycemia due to a total, and/or a relative lack of insulin secretion and insulin resistance or a combination of both. The metabolic derangements associated with diabetes mellitus involve abnormalities in the metabolism of carbohydrates, fats and proteins [1].

Diabetes mellitus affects all age groups and both sex. However, its manifestations and complications are more common in adults compared to children and other young individuals. The prevalence of diabetes mellitus has drastically increased over the past few years, and might even triple in the next decade [3]. About 537 million adults are currently living with DM, with 783 million expected by the year 2045. An additional 374 million people have prediabetes and are at risk of developing T2DM [3]. This frightening data has necessitated the World Health Organization to designate

diabetes mellitus as a global pandemic.

There are several types of diabetes mellitus, although Type 1, Type 2 and Gestational diabetes mellitus are generally the most common types [4, 5]. Type 1 diabetes mellitus is characterized by autoimmune destruction of the Beta cells of the pancreas with an absolute deficiency of insulin, while Type 2 diabetes mellitus is characterized by insulin resistance and a relative deficiency of insulin secretion [6]. Gestational diabetes is glucose intolerance occurring during pregnancy, with onset often from the second trimester [7].

Diabetes mellitus is associated with several complications which are well documented. Several organs and tissues are affected including the oral cavity. Various inflammatory and soft tissue diseases of the oral cavity have been associated with diabetes mellitus. Some of these manifestations include salivary dysfunction, periodontal diseases, bacterial and fungal mouth infections and oral mucosa lesions (e.g. geographic tongue, fissured tongue, etc.) Others include dental caries, loss of dentition, mucosa neurosensory disorders and delayed oral mucosa wound healing [8-11].

Poor oral health is known to be associated with decreased quality of life (QoL) [12]. Studies have shown that these oral lesions are more common in patients with diabetes mellitus compared to the general population and are basically due to poor glycemic control. Despite the globally recognised deleterious effects of diabetes mellitus on the oral health of individuals, there is no known publication on the manifestations of oral health dysfunction in diabetes patients in our study environment. This study attempts to fill this gap in knowledge and hope to highlight the common oral changes in diabetes patients receiving care in our facility.

2. Methodology

This was a crossectional descriptive study conducted in the Endocrinology and Dental clinics of the University of Uyo Teaching Hospital (UUTH). The University of Uyo teaching hospital is located in Akwa-Ibom state, Southern Nigeria and is the only tertiary healthcare center in the state. It basically offers specialist care to inhabitants of Uyo, an urban settlement and capital of Akwa-Ibom state. It also receives referral from surrounding cities, states in Nigeria and neighbouring countries.

The Endocrine clinic of UUTH is run twice weekly by a team of Consultants and a number of Specialist Senior registrars and registrars. The first clinic is a specialist clinic that caters for persons living with diabetes mellitus while the other clinic focuses on other endocrine cases as well as general medical cases. An average of seventy patients are seen weekly in the diabetes clinic of UUTH. Patients from virtually all tribes in Nigeria are seen in UUTH. The dental clinic of UUTH, manages a plethora of dental cases, and in conjunction with the diabetes clinic, manages the dental manifestations of patients with diabetes mellitus. A two way referral exists between both clinics.

The study was conducted over a six months period, starting from January and terminating in June of 2019. A total of one hundred and fifty participants were recruited for the study. One hundred of the participants were persons living with diabetes mellitus while the remaining fifty were recruited as controls for the study. Recruitment of diabetes patients was done consecutively on every clinic day. The first thirty patients in the clinic register were contacted and those who consented were enrolled for the study. These persons were given appointment to visit both the diabetes and dental clinics for the study proper. On the day of the study, while in the diabetes clinic, the patients biodata were recorded. They were examined and blood samples taken for fasting plasma glucose and glycated haemoglobin after taking the necessary precautions. While in the dental clinic, patients were examined by a team of Consultants and Specialist resident doctors, to detect the presence or absence of some common oral health disorders. The recruitment of the diabetes patients was completed after the first three months. The controls were recruited from the hospital community (members of staff) over the last three months of the study after giving their consent. They were assessed in both the diabetes and dental clinics like their diabetes counterparts. The findings were carefully entered into Excel spreadsheet.

Data obtained was arranged into tables and charts and analyzed using the statistical package for the social sciences version 20 (SPSS version 20). Data distribution for normality was done using the Pearson's test. Summary description of data was listed as mean, median, standard deviations, confidence intervals, proportions and tables. The comparison of categorical variables was determined using Chi square with the level of significance set at p values <0.05.

Table 1. *Socio-demographic and clinical characteristics of respondents.*

Variables	Study Groups		Total n (%)	Statistical tests and P Values
	Diabetics (n =100)	Controls (n=50)		
Age (years)	57.19+/-10.75	47.58+/-4.36	53.99+/-10.18	P<0.001*
Gender				
Males	27 (27.00)	19 (38.00)	46 (30.67)	χ^2=1.90
Females	73 (73.00)	31 (62.00)	104 (69.33)	P=0.17
[+]Duration of ailment (years)	6 (2-12)			
FPG (mean+/-SD)	8.48+/-3.28	4.58+/-0.37	7.18+/-3.26	P<0.001*
HbA1c (Mean+/-SD)	7.65+/-0.94	4.83+/-0.35	6.71+/-1.54	P<0.001*
BMI(mean+/- SD)	28.39+/-5.13	30.76+/-2.06	29.18+/-4.49	P=0.002*
Waist circumference (cm)	101.63+/-11.97	95.38+/-5.51	99.55+/-10.67	P=0.0006*

*=statistically significant, FPG=Fasting plasma glucose, BMI=Body Mass Index.

3. Results

3.1. Socio-demographic and Clinical Characteristics

The socio-demographic and clinical characteristics of the study participants are shown in Table 1.

The diabetics were significantly older than the controls (57.19 versus 47.58; p<0.001). The number of males and females were similar in the two groups (p=0.17). The median duration of ailment was 6 (2-12) years. Fasting plasma glucose, mean HBA1c and waist circumference were significantly higher in the diabetics compared to the controls (p<0.001, p<0.001 and p<001 respectively). The BMI was significantly higher amongst the control compared to the diabetics (30.76 versus 28.39; p=0.002).

3.2. Comparison of the Signs of Poor Oral Health Among Participants

The signs of poor oral health among the study participants is shown in Table 2. Seven respondents out of the diabetics had halithosis. There was no significant association between the presence of halithosis between diabetics and controls. (p=0.10) There was a significant association between the occurrence of gingivitis and the study groups the respondents belonged to. Significantly more diabetics had gingivitis compared to the controls (p<0.001). There was a significant association between occurrence of periodontitis and caries with the study groups the respondents belonged to, with all cases of periodontitis and caries occurring in diabetics compared to controls (p<0.001 and p=0.03 respectively). There was a significant association between the occurrence of missing teeth (p<0.001), gingival recession (p<0.001), broken teeth (p<0.03) with the study groups of the respondents. The occurrence of thrush, mobile teeth, gingival abscess, external stain, attrition and abrasion was higher among the diabetes Patients though this finding was not statistically significant. (p>/=0.05).

Table 2. *Comparison of signs of poor oral health between diabetics and controls.*

Variables	Study Groups		Total n (%)	Statistical tests and P Values
	Diabetics (n =100)	Controls (n=50)		
Halithosis				
Present	7 (100.00)	0 (0.00)	7 (4.67)	FE=0.10
Absent	93 (93.00)	50 (100.00)	143 (95.33)	
Gingivitis				
Present	96 (96.00)	4 (4.00)	100 (100.00)	FE<0.001*
Absent	4 (8.00)	46 (92.00)	50 (100.00)	
Periodontitis				
Present	51 (51.00)	0 (0.00)	51 (34.00)	Fishers exact P<0.001*
Absent	49 (49.00)	50 (100.00)	99 (66.00)	
Caries				
Present	9 (9.00)	0 (0.00)	9 (6.00)	FE= 0.03*
Absent	91 (91.00)	50 (100.00)	141 (94.00)	
Thrush				
Present	3 (3.00)	0 (0.00)	3 (2.00)	FE=0.55
Absent	97 (97.00)	50 (100.00)	147 (98.00)	
Mobile Teeth				
Present	8 (8.00)	0 (0.00)	8 (5.33)	FE= 0.05
Absent	92 (92.00)	50 (100.00)	142 (94.67)	
Gingival Abscess				
Present	3 (100.0)	0 (0.00)	3 (100.00)	FE=0.55
Absent	97 (65.99)	50 (34.01)	147 (100.00)	
Missing Teeth				
Present	31 (96.88)	1 (3.13)	32 (21.33)	FE=<0.001
Absent	69 (58.47)	49 (41.53)	118 (78.67)	
External stain				
Present	33 (78.57)	9 (21.43)	42 (28.00)	χ^2=3.72; P=0.05
Absent	67 (62.04)	41 (37.96)	108 (72.00)	
Gingival Recession				
Present	39 (100.00)	0 (0.00)	39 (26.00)	FE<0.001
Absent	61 (54.95)	50 (45.05	111 (74.00)	
Attrition				
Present	8 (100.00)	0 (0.00)	8 (5.33)	FE=0.05
Absent	92 (64.79)	50 (35.21)	142 (94.67)	
Abrasion				
Present	5 (100.00)	0 (0.00)	5 (3.33)	FE=0.17
Absent	95 (65.52)	50 (34.48)	145 (96.67)	
Broken Teeth				
Present	9 (100.00)	0 (0.00)	9 (6.00)	FE=0.03*
Absent	91 (64.54)	50 (35.46)	141 (94.00)	

FE=Fishers exact. *= significant p value.

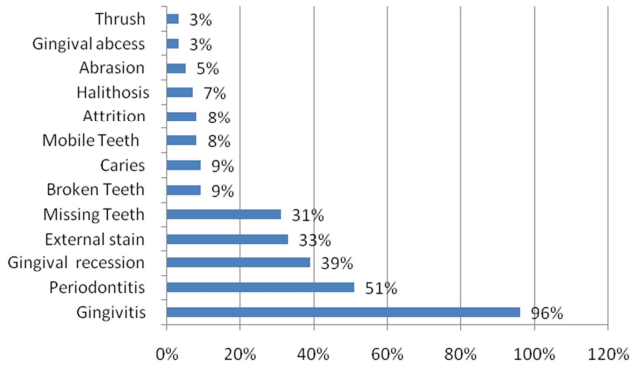

Figure 1. *Clinical Features of poor oral health in Diabetics (n=100).*

3.3. Oral Health Changes in Dabetics

The distribution of the oral health changes seen among the persons living with diabetes is shown in Figure 1. The top 5 abnormalities are gingivitis 96 (96%), Periodontitis 51 (51%), gingival recession 39 (39%), external stain 33 (33%) and missing teeth 31 (31%). Gingivitis is the commonest oral health disorder seen among persons living with diabetes. Periodontitis is the next common oral health disorder seen in diabetics.

3.4. Relationship Between Oral Health Changes and Glycaemic Control in Diabetics

The relationship between the oral health changes seen in diabetics and glycaemic control is shown in Table 3. Periodontitis was significantly associated with HBA1c levels of diabetic respondents with more cases of periodontitis seen in diabetics with raised HBA1c ($p<0.001$). There was a clear pattern of higher HbA1c values among the diabetics compared with the controls using the presence of gingivitis, gingival recession, external stain, missing teeth, broken teeth, caries, mobile teeth, attrition, halithosis, abrasion, gingival abscess and thrush as basis for comparison though this difference was not statistically significant ($p>0.005$).

Table 3. *Relationship between oral health changes and HBA1c levels in diabetics.*

Variables	Normal HBA1c (n=21; 21%)	Raised HBA1c (n=79; 79%)	Total n (%)	Statistical test and P value
Gingivitis				
Present	20 (20.83)	76 (79.17)	96 (100.00)	Fishers Exact=0.99
Absent	1 (25.00)	3 (75.00)	4 (100.00)	
Periodontitis				
Present	2 (3.92)	49 (96.08)	51 (100.00)	FE=<0.001*
Absent	19 (38.78)	30 (61.22)	49 (100.00)	
Gingival recession				
Present	5 (12.82)	34 (87.18)	39 (100.00)	χ^2=2.58
Absent	16 (26.23)	45 (73.77)	61 (100.00)	P=0.11
External stain				
Present	6 (18.18)	27 (81.82)	33 (100.00)	χ^2=0.24
Absent	15 (22.39)	52 (77.61)	67 (100.00)	P=0.63
Missing Teeth				
Present	7 (22.58)	24 (77.42)	31 (100.00)	χ^2=0.07
Absent	14 (20.29)	55 (79.71)	69 (100.00)	P=0.79
Broken Teeth				
Present	1 (11.11)	8 (88.89)	9 (100.00)	FE=0.68
Absent	20 (21.98)	71 (78.02)	91 (100.00)	
Caries				
Present	1 (11.11)	8 (88.89)	9 (100.00)	FE=0.68
Absent	20 (21.98)	71 (78.02)	91 (100.00)	
Mobile Teeth				
Present	0 (0.00)	8 (100.00)	8 (100.00)	FE=0.20
Absent	21 (22.83)	71 (77.17)	92 (100.00)	
Attrition				
Present	0 (0.00)	8 (100.00)	8 (100.00)	FE=0.20
Absent	21 (22.83)	71 (77.17)	92 (100.00)	
Halithosis				
Present	0 (0.00)	7 (100.00)	7 (100.00)	FE=0.34
Absent	21 (22.58)	72 (77.42)	93 (100.00)	
Abrasion				
Present	0 (0.00)	5 (100.00)	5 (100.00)	FE=0.58
Absent	21 (22.11)	74 (77.89)	95 (100.00)	
Gingival Abscess				
Present	0 (0.00)	3 (100.00)	3 (100.00)	FE=0.99
Absent	21 (21.65)	76 (78.35)	97 (100.00)	
Thrush				
Present	0 (0.00)	3 (100.00)	3 (100.00)	FE=0.99
Absent	21 (21.65)	76 (78.35)	97 (100.00)	

FE= Fishers exact. *=significant p value.

3.5. Association Between Selected Factors and Oral Health Status of Respondents

The association between factors such as diabetes status, age, gender, duration of diabetes, glycaemic control, BMI, waist circumference and FPG is shown in Table 4. Study groups and age of respondents were significantly associated with oral health status of respondents with more diabetics and older respondents having poor oral health than (P<0.001 respectively). The HBA1c levels, BMI, waist circumference and fasting plasma glucose were significantly associated with oral health status of respondents (p<0.001, p=0.02, p=0.002 and p<0.001 respectively). There was no significant association between gender, duration of diabetes and oral health status of respondents (p=0.86 and p<0.39 respectively).

Table 4. *Association between selected factors and oral health status of respondents.*

Variable	Oral Health		Total	Statistical tests and P values
	Poor (n=109; 72.7%)	Good (n=41; 27.3%)		
Study groups				
Diabetics	98 (98.00)	2 (2.00)	100 (100.00)	FE <0.001*
Controls	11 (22.00)	39 (78.00)	50 (50.00)	
Age	56.32+/-10.70	47.78+/-4.74	53.99+/-10.18	P<0.001*
Gender				
Male	33 (71.74)	13 (28.26)	46 (100.00)	χ^2=0.03
Female	76 (73.08)	28 (26.92)	104 (100.00)	P=0.86
Duration of DM [n=100]	5.5 (2-12)	10 (8-12)	6 (2-12)	P=0.39
HBA1c Levels				
Normal	36 (33.03)	40 (52.63)	76 (100.00)	FE<0.001*
Raised	73 (66.97)	1 (1.35)	74 (100.00)	
BMI(mean SD)	28.66+/-4.98	30.55+/-2.30	29.18+/-4.49	P=0.02*
Waist circumference	101.17+/-11.59	95.22+/-5.96	99.55+/-10.67	P=0.002*
FPG	8.01+/-3.28	4.99+/-1.94	7.18+/-3.26	P<0.001*

FE= Fishers exact, *=significant p value.

3.6. Routine Oral Checks Among Study Participants

The study participants were assessed for routine oral checks. The result is as shown in table 5 below. The result shows that only one Person living with diabetes out of the 100 assessed, routinely went for oral checks. Among the controls only 3 out of the 50 assessed went for routine oral checks.

Table 5. *Association between routine oral checks and study groups.*

Variables	Diabetics (n=100)	Controls (n=50)	Total n (%)	Statistical test and P value
Routine Checks				
Yes	1 (25.00)	3 (75.00)	4 (100.00)	Fishers Exact=0.11
No	99 (67.81)	47 (32.19)	146 (100.00)	

3.7. Comparison of Oral Health Status of Diabetes Patients and Controls

The oral health status of participants were compared and the result is as shown in figure 2 below.

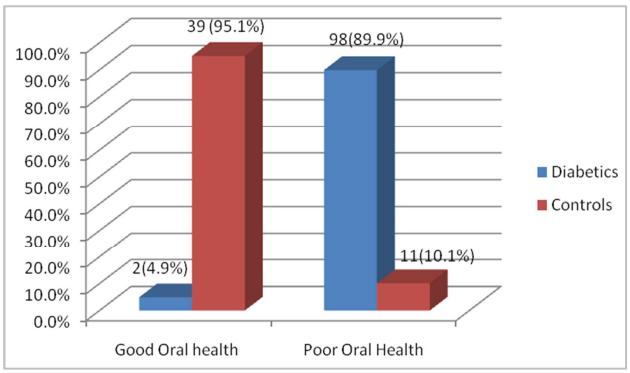

Figure 2. *Comparison of the oral health status between diabetics and controls.*

Forty one had good oral health out of which 2 (4.9%) were diabetics. One hundred and nine had poor oral health and diabetics constituted the majority 98 (89.9%) while 11 controls (10.1%) also had poor oral health. The difference between the oral health status between diabetics and controls was statistically significant (p<0.001).

3.8. Predictors of Poor Oral Health

A search for the predictors of poor oral health among the study population was done and the result is shown in table 6. At the univariate level, diabetics were 174.7 times significantly more likely to have poor oral health compared to the controls (OR 174.7, 95%CI=36.81-819.87, p<0.001). For every 1year increase in age, chances of having poor oral health significantly increased by 1.1 times (OR=1.11, 95%CI=1.06-1.16; p<0.001). Females had 1.07 times higher chances of having poor oral health compared to males but this difference was not statistically significant (OR=1.07, 95%CI=0.49-2.32; p=0.86). For

every 1 year increase in duration of diabetes, chances of having poor oral health non significantly reduced by 4% (OR 0.96, 95%CI=0.80-1.15; p=0.63). For every one unit increase in the value of HBA1c, chances of having poor oral health significantly increased by 6.76 times (OR=6.76, 95%CI=3.57-12.77; p<0.001). For every one unit increase in the body mass index, chances of having poor oral health significantly increased by 9% (OR=0.91, 95%CI=0.83-0.99; p=0.03). For every one unit increase in waist circumference of respondents, chances of having poor oral health significantly increased by 1.07 times (OR=1.07, 95%CI=1.02-1.11; p=0.003). For every 1 mmol/l increase in Fasting plasma glucose, chances of having poor oral health significantly increased by 1.95 times (OR=1.95, 95%CI=1.45-2.62; p<0.001).

At the multivariate level, diabetics were 62.34 times significantly more likely to have poor oral health compared to the controls (OR 62.34, 95%CI=1.45-2668.94, p=0.03). Age, HBAIc, BMI and waist circumference were not predictors of poor oral health.

Table 6. *Predictors of Poor oral health using Binary logistic regression.*

Variable	Univariate Models			Multivariate Models		
	Crude OR	P value	95%CI	Adjusted OR	P value	95%CI
Study Arm						
Control	Ref			Ref		
Diabetics	174.7	<0.001*	36.81-819.87	62.34	0.03*	1.45-2668.94
Age	1.11	<0.001*	1.06-1.16	1.05	0.33	0.95-1.16
Gender						
Male	Ref					
Females	1.07	0.86	0.49-2.32			
Duration of DM	0.96	0.63	0.80-1.15			
HBA1c	6.76	<0.001*	3.57-12.77	4.06	0.07	0.88-18.78
BMI	0.91	0.03*	0.83-0.99	0.95	0.78	0.66-1.38
Waist circumference	1.07	0.003*	1.02-1.11	1.03	0.64	0.88-1.21
FPG	1.95	<0.001*	1.45-2.62	0.55	0.02*	0.33-0.92

OR=Odds ratio; CI= Confidence interval, * =significant p values.

4. Discussion

This study set out to determine the oral health status of diabetes patients, including the pattern of changes observed, the relationship between these oral health changes and glycaemic control as well as other indices like obesity and routine oral checks.

The diabetes patients were older than the controls. This finding is not unusual since the bulk of the diabetes patients had Type 2 diabetes which affects older persons more. This is in contrast with the controls who were staffs of the Teaching Hospital in active service and expected to be younger. Retirement age is fixed at sixty years. Persons older than 65yrs (the elderly) are known to have poorer oral health compared to the non-elderly [13]. The mean age of the entire study population fell short of the elderly age bracket thus not making advancing age and age disparity, a factor of note in this study.

The fasting blood glucose concentrations, glycated hemoglobin levels and waist circumference of the diabetes patients in this study were significantly higher when compared with the controls. Diabetes mellitus is a disorder in glucose metabolism which is also mirrored by the concentration of glycated hemoglobin in the plasma [14]. Hence, it is expected that mean fasting blood glucose concentrations and glycated hemoglobin levels should be higher in diabetes patients. Higher waist circumference in the diabetes patients is caused by truncal obesity which is due mainly to increased adiposity, a factor which is well known to be an independent risk factor for the occurrence of type 2 diabetes mellitus and worsening of glycaemic control [15].

Conversely, the body mass index of diabetics in this study was significantly lower than those of the controls. Obesity is not known to be a common finding among persons living with diabetes in Nigeria. Overweight rather than frank obesity is more common among Nigerian diabetics [16]. The most likely explanation is that most diabetics receiving treatment in a tertiary hospital set up like ours are enrolled in a weight control program in contrast to the controls who lack such exposure hence the higher BMI among the controls.

Periodontal abnormalities (including gingivitis and periodontitis) were the commonest oral manifestations of diabetes mellitus in this study. Oral health disorders were uncommon among the non diabetic controls. This finding is in consonance with several studies which have established that diabetic patients are far more likely to have periodontal diseases than normal subjects [17-19]. The explanation for this is not well understood. There is a postulation that chronic hyperglycemia can cause the release of pro-inflammatory cytokines, bacterial accumulation and subsequent periodontal tissue destruction [20]. Periodontitis and hyperglycemia share the same risk factors [26, 27] and hence often occur in the same individuals with compromised immune systems or exhibiting hyperinflammatory responses; and they additionally adversely affect each other.

A much greater proportion of people with DM suffer from periodontitis [28-30], and the severity of periodontitis is much greater, especially in poorly or uncontrolled DM [28, 31, 32]. Citing clinical studies from Denmark [33], Australia [34], Finland [35], Argentina [36], and the US [37, 38], including among the Pima Indians in Arizona [39-41],

periodontitis was declared the sixth complication of DM in 1993 [42], but with negligible effect on the medical and dental communities.

Conversely, people with periodontitis are much more likely to have T2D [40, 43]. Periodontitis, *via* bacteremia [44, 45] and inflammatory responses of which hyperglycemia is a normal part, is a risk factor for DM, as well as, incident T2DM, gestational DM, poorer glycemic control in existing DM, and more severe DM complications [46, 47]. Furthermore, periodontitis is increasingly regarded as an independent risk factor for the macro-vascular DM complications like cardiovascular disease (CVD) [48-51] and ischemic stroke [46, 51], and is associated with the microvascular DM complications: neuropathy [51, 52], nephropathy [53-55], and retinopathy [51, 53].

This study also revealed a significant association between periodontitis and the HBA1c levels of participants. Similar findings were reported by Isola et al amongst their subjects [21]. Poor glycaemic control evidenced by significantly raised HBA1c is known to be a precursor for the onset of periodontitis and vice-versa [23]. Also, improved glycaemia has been shown to slow the progression of periodontitis.

Occurrence of missing teeth, broken teeth and gingival recession were significantly more in diabetics than controls. Similar findings were reported by Haseeb et al amongst diabetic patients in Lahore, Pakistan [22]. Worsening glycaemic control with subsequent periodontal inflammation, loss of periodontal tissue, and loss of periodontal attachment could possibly be the reason for these findings in our patients [23].

The HBA1c levels, BMI, waist circumference and fasting blood glucose were significantly associated with the oral health status of the diabetic patients. Indices of obesity such as BMI and waist circumference are known to be strongly associated with poor glycaemic control, reflected by increased levels of HBA1c and fasting blood sugar [24].

A notable finding from this study is the fact that routine dental check up is rare among our population. It is recommended that the general population visit the dentist every six months for routine a check. Diabetes patients who are even more prone to oral lesions are expected to visit the dentist three monthly [25]. This finding is not unusual and is a likely contributor to the high incidence of oral health disorder among diabetics compared to the controls who equally have a poor habit of routine oral health checks but their case is better because of the absence of diabetes and its myriad of complications.

5. Conclusion

This study has shown that diabetics have a poor oral health status compared to the general population with periodontal changes being the most common in our environment. Poor glycaemic control and poor routine oral checks have been shown to greatly contribute to these findings. This study has also shown that the chances of persons living with diabetes developing oral lesions is far higher(more than double) compared to the non diabetes population.

6. Recommendation

Routine dental checks and optimal glycaemic control is recommended for persons living with diabetes, to reduce the oral health burden and the additional health risks posed especially by periodontal disease. A follow up study that will look at the effect of improved glycaemia on oral health in persons living with diabetes is suggested.

Disclosure

The authors declare that they have no competing interests.

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