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Original Article

Knowledge and Awareness about Oral Manifestations of Diabetes Mellitus Among Type -II Diabetes Patients in Chengalpet District, Tamil Nadu, India

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Abstract

Introduction : The aim of this study is to assess the knowledge and awareness about oral manifestations of diabetes among diabetic patients in Chengalpet district.

Materials and Methods : A cross- sectional study was conducted using a self-administered questionnaire consisting of different statements on knowledge and awareness of diabetic patients on the oral manifestations of diabetes mellitus (n = 153). The questionnaire included the demographic data, drug history, periodontal and dentition changes, their oral hygiene practices and their knowledge about the oral manifestations of diabetes mellitus.

Results : A total of n = 153 patients were included, n = 77 (50.3%) patients were male and n = 76 (49.6%) were female. The results of this study showed that a majority of people with diabetes are unaware of the bidirectional link between diabetes and its oral manifestations and they have limited knowledge of their risks for oral health problems. Majority of the patients were not aware about the oral manifestations such as Bleeding from gums n = 114 (75.1%), Burning Sensation n = 113 (74.3%), Altered Taste Sensation n = 118 (77.6%), Oral Malodourn = 125 (82.2%), Increase in Dental caries n = 105 (69.1%), Mobility of teeth n = 108 (71.1%). The results also showed that n = 73 (48%) of the participants were aware about the dryness of mouth.

Conclusion : Patients with diabetes mellitus are not well-informed or aware of the oral symptoms of the disease.

Key words : Type II Diabetes Mellitus, Knowledge, Awareness, Oral Manifestations, Periodontitis

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INTRODUCTION

In many nations, diabetes mellitus (DM) is a significant public health issue that is on the rise and a leading cause of morbidity and premature mortality. People of Indian heritage are significantly more likely to develop diabetes, according to recent research of geographical and ethnic effects. Diabetes mellitus is a genetically and clinically heterogeneous category of metabolic condition caused by insulin shortage, which results in elevated blood glucose (hyperglycemia) either by damage to pancreatic beta cells or increased tissue resistance to insulin (1). Type 1, Type 2, and other specialised forms, such as gestational DM, were classified by the American Diabetes Association (2). Long-term uncontrolled hyperglycemia might result in systemic consequences including cardiovascular illnesses. According to estimates, there were 30 million cases of diabetes in 1985, 135 million in 1995, and 366 million by 2030 (3).

The diabetes epidemic is said to have its epicentre in India. By 2025 and 2030, the nation's diabetes population is anticipated to reach the frightening milestones of 69.9 million and 80 million, respectively (4). At most 1-2% of adults in traditional rural communities have diabetes, compared to 1-13% of individuals in metropolitan settings. It is believed that neither type 1 nor type 2 diabetes has much, if any, gender prejudice. The ratio of men to women is approximately 3:2. Men appear to be more susceptible than women to the potential effects of indolence-related obesity due to differences in insulin sensitivity. Due to differences in insulin sensitivity and localised fat deposition, men appear to be more vulnerable than women to the consequences of indolence-related obesity. Also, there are numerous oral problems. Uncontrolled diabetes increases a person's risk for many issues, including periodontal disease, 1.8:1 (Type 1 DM) and 1.3:1 (Type 2 DM) male to female ratios were seen across all groups (5).

Poorly controlled diabetes in adults triples the risk of periodontal disease, which can cause tooth loss. Due to decreased salivary production, diabetes patients are more prone to dental caries as well as periodontal disease or xerostomia. Conversely, untreated periodontal disorders are shown to affect glycaemic control by causing a persistent inflammatory state that may lead to insulin resistance (2). Increased candida growth and oral mucosal lesions are also seen in DM patients. According to studies, people are more aware of the systemic complications of diabetes than the harmful oral effects. Therefore, the purpose of this study is to evaluate the level of awareness and knowledge of changes in the oral cavity brought on by DM among diabetic patients in Chengalpet District.

MATERIALS AND METHODS

Asan Memorial Dental college & Hospital, chengalpattu's Institutional Scientific Review Board granted approval, towards this cross-sectional study. Sample size was estimated to b N = 126 based on the study conducted by Almehmadi et al in Saudi Arabia (2) using G*Power version 3.1. Participants were given structured self-administered questionnaires with varied statements on diabetic patients' awareness of oral manifestation that had been translated into Tamil and then back into English. The inclusion criteria are (i) having been diagnosed with diabetes for at least two years (ii) having type 2 diabetes (iii), (iv) being older than 30 years of age, (v) including both males and females, and (vi) being literate. Pregnant women with gestational diabetes, people with disabilities, those who are mentally ill or challenged, and patients under the age of 20 are among the exclusion criteria.

The questionnaires were given out to diabetes patients from the Chengalpattu districts of Tamil Nadu who were attending the outpatient block at Asan Memorial Dental College & Hospital. Each person took between 5 and 10 minutes to finish the questionnaire. The study took place between April 2022 and July 2022, and the data were gathered during a four-month period.

Data obtained was entered in Microsoft Excel Software and the statistical analysis was done using Statistical Package for Social Sciences (SPSS) TM Software (Version 23.0), (SPSS Inc, Chicago, II, USA).

RESULTS

Total N = 153, Type 2 diabetes mellitus patients participated in the study, of which, n = 77(50.3%) patients were male and n = 76 (49.6%) were female.

Table 1 Diabetic Profile of the study participants shows that, n = 42 (27.6%) patients had diabetes for <3 years, n = 35 (23%) patients for 3-5 years and n = 75 (49.3%) patients had for >5 years, and history of patients under medications for diabetics, most of the patients n = 132 (86.8%) were under medications since the day the diagnosis was made and n = 20 (13.2%) patients were not under medication ($p<0.05$ – Statistically significant).

Table 2 Oral Hygiene Practices and Dental Attendance among study participants, mentioning brushing habits showed that n = 95 (62.5%) of the participants brushed once daily and n = 55(36.2%) of the participants brushed twice daily. This indicates that although majority of the participants brushed only once daily, awareness on the brushing habits among the sample population were significant. This data when subjected to statistical analysis was found to be significant. Participants were not aware on the use of other interdental aids such as flossing or interdental brushes. The frequency of dental consultation among the study subjects showed that n = 124 (81.6%) of the participants do not visit the dental clinics on a regular basis whereas, n = 28 (18.4%) of the participants have reported to go for the dental check-ups on a regular basis ie., once in 6 months. The data when subjected to statistical analysis, was not found to be significant.

Table 3 Knowledge about oral manifestations of Diabetes among study participants showed that majority of the participants were not aware about the oral manifestations of diabetes such as Bleeding from gums n = 114 (75%), Burning Sensation n = 113 (74.3%), Altered Taste sensation n = 118 (77.6%), Oral malodour n = 125 (82.2%) ($p<0.05$ – Statistically significant), Ulcers in oral cavity n = 124 (81.6%), Increased dental caries n = 105 (69.1%), Mobility of Teeth n = 108 (71.1%). The results also showed that n = 73 (48%) of the participants were aware about the dryness of the mouth.

Table 1 – Diabetic Profile of the study participants

S. No	Question	Response	N (%)	p-value (Age)	p-value (Gender)
1	How long you are suffering from Diabetes?	<3 years	42 (27.6%)	0.04*	0.18
		3-5 years	35 (23%)		
		>5 years	75 (49.3%)		
2	Are you under medication for Diabetes?	Yes	132 (86.8%)	0.260	0.63
		No	20 (13.2%)		
3	Last Diabetic consultation with the physician or diabetologist	< 6 months	93 (61.2%)	0.160	0.035*
		6 months – 1 year	32 (21.1%)		
		>1 year	27 (17.8%)		

* χ^2 – Test, ($p<0.05$ – Statistically Significant)

Table 2- Oral Hygiene Practices and Dental Attendance among study participants

S. No	Question	Response	N (%)	p-value (Age)	p-value (Gender)
1	Frequency of Brushing teeth / day	Once	95 (62.5%)	0.58	0.420
		Twice	55 (36.2%)		
		>2 times	2 (1.3%)		
2	Usage of Interdental and auxiliary aids	Yes	31 (20.4%)	0.057	0.83
		No	121 (79.6%)		
3	Regular Dental Consultation	Yes	28 (18.4%)	0.69	0.56
		No	124 (81.6%)		

*χ^2 – Test, ($p<0.05$ – Statistically Significant)

Table 3- Knowledge about oral manifestations of Diabetes among study participants

S. No	Oral Manifestations of Diabetes	Response		p-value [Age]	p-value [Gender]
		Yes n (%)	No n (%)		
1	Bleeding from gums	38 (25%)	114 (75%)	0.21	0.52
2	Dryness of mouth	73 (48%)	79 (52%)	0.32	0.62
3	Burning Sensation	39 (25.7%)	113 (74.3%)	0.74	0.10
4	Altered Taste sensation	34 (22.4%)	118 (77.6%)	0.52	0.54
5	Oral malodour	27 (17.8%)	125 (82.2%)	0.40	0.01*
6	Ulcers in oral cavity	28 (18.4%)	124 (81.6%)	0.58	0.84
7	Increased dental caries	47 (30.9%)	105 (69.1%)	0.30	0.45
8	Mobility of Teeth	44 (28.9%)	108 (71.1%)	0.20	0.79

*χ^2 – Test, ($p<0.05$ – Statistically Significant)

DISCUSSION

About 153 people with Type II diabetes were included in the current investigation. This study's main objective was to summarise the most recent research on diabetes mellitus patients' attitudes and knowledge regarding oral manifestations of the disease. The questionnaire asked about the respondents' demographic information, pharmacological history, periodontal and endodontic alterations, oral hygiene routines, and knowledge of the oral symptoms of diabetes mellitus. Overall, the study's findings indicated that most diabetics are uninformed of the relationship between their condition and its oral manifestations and are only vaguely aware of their oral health hazards.

However, the majority of diabetics did not obtain oral health care advice or information about the dangers associated with their diabetes from their diabetes care providers. This discovery is consistent with the findings of a previous scoping review, which investigated the practises and knowledge of diabetes care providers in oral health care and discovered that they typically do not give their patients any information on oral health care in the diabetes care settings. Despite having a significant risk of developing oral health issues, people with diabetes have a very poor perception of the need for and value of receiving dental care, suggesting that oral health is not as crucial to their wellbeing as general health (6).

The majority of patients in our study (between 70% and 75%) were unaware of the oral symptoms of diabetes mellitus. This study is comparable to that conducted by Parakh M et al., which revealed a serious lack of awareness among those with diabetes mellitus (7). Our data contradicts a study by Staden et al that found patients were aware of the oral symptom, most likely as a result of the study being conducted among better educated people (8). Weinspach et al.'s study found that 56% of the participants were unaware of the relationship between diabetes and periodontitis, which is consistent with the value of the current study (73.05%) (9).

In this study, 77.6% of the individuals displayed changed taste perception, which is comparable to a study by Gondivkar et al, in which 80% of the diabetic people with uncontrolled diabetes and 50% of those with controlled diabetes showed impaired taste perception (10). Mohammed S. Al-Zahrani et al.'s study revealed that 42.1% of the individuals had halitosis, which is comparable to our study's finding that 17.8% of participants had the condition (11).

Similar to the study by Bakhshandeh et al, which found that patients with longer duration were likely to have higher level of awareness, our study found that lower duration of diabetes mellitus was significantly associated with the lack of knowledge on the association between periodontal disease and diabetes mellitus. In fact, 75% of the participants who had been diagnosed with diabetes mellitus for more than 5 years were unaware about the oral manifestations of diabetes (12).

Given that the participants self-administered the questionnaires, geographic location and personal bias were thought to be the study's shortcomings.

CONCLUSION

Among those with diabetes mellitus, there is a lack of understanding, attitude, and awareness regarding the oral manifestations of the disease. All medical facilities and healthcare initiatives should take increased knowledge of these oral signs and symptoms of diabetes mellitus into account.

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Conflicts of interest

There are no conflicts of interest

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