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Original Research Article

Knowledge, awareness and practice of oral health care among diabetes mellitus patients in Chennai population

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ABSTRACT

Background: Diabetes mellitus (DM) is a common chronic disease with an increasing prevalence, affecting general and oral health, with plethora of oral manifestations. There is a threefold increase in the predominance and severity of periodontitis in patients with diabetes, especially in those with poor metabolic control. Hence, this study aimed to explore the knowledge and awareness of oral health care among diabetic mellitus patients in Chennai population. The objective was to assess their attitudes and practices towards sustaining good oral health through proper oral hygiene and regular dental check-ups.
Methods: A questionnaire-based study was conducted to determine the knowledge and awareness of oral health care among DM patients in Chennai at Health care centers from January to June 2022. The sample size included questionnaires from 500 patients. The questionnaire was prepared, first in English, and then, it was translated into local language i.e., Tamil to collect the data.
Results: The chi-square test was used to see the significance of participant's awareness of oral complications associated with diabetes. There was a strong statistical significance relationship with respect to oral health knowledge among different age groups ($p<0.05$).
Conclusions: Diabetes mellitus may be regarded as one of the most dreaded and silent epidemic health problem in the immediate future, especially in the developing countries. Therefore, it is of paramount importance to know about the increased risk of oral diseases in diabetes mellitus.

Keywords: Attitudes, Diabetes mellitus, Knowledge, Oral health, Periodontitis, Practice

INTRODUCTION

Diabetes mellitus involves a group of metabolic disorders characterized by hyperglycemia secondary to defects in insulin secretion, insulin action or both. Type 1 diabetes is characterized by decreased secretion of insulin due to autoimmune or idiopathic destruction of the β-cells in the pancreas. Whilst, type 2 diabetes- the more common form, is characterized by insulin resistance in peripheral tissues usually in combination with decreased insulin secretion.[1] Diabetes mellitus (DM) is a common chronic disease with an increasing prevalence, affecting general and oral health, with plethora of oral manifestations. Many researchers have reported a bidirectional effect of diabetes and periodontal diseases.[2] The increase in incidence of diabetes in developing countries follows the trend of urbanization and lifestyle changes.[3] There is a threefold increase in the prevalence and severity of periodontitis in patients with diabetes, especially those with poor metabolic control, leading to the designation of periodontal disease as the "sixth" complication of diabetes.[4] Diabetes mellitus is associated with many micro and macro vascular complications in the body. In

addition to these, oral complications and manifestations in the form of gingivitis, periodontitis, xerostomia, opportunistic infections, copious plaque accumulation and delayed wound healing. Apart from these, oral paresthesia, altered taste and candidiasis are also becoming the emerging problems in dental health sector and has a very important impact on the social and economic sectors of various countries.[5]

Hence, it is a need of the hour that DM patients should be aware of these complications associated with their condition, so that a proper oral hygiene can be maintained to moderate oral complications related with it. With this in mind, the present study aimed to explore the knowledge and awareness of oral health care among diabetic mellitus patients in Chennai population. The objective was to assess their attitudes and practices towards sustaining good oral health through proper oral hygiene and regular dental check-ups.

METHODS

Study design

A questionnaire-based study was conducted to determine the knowledge and awareness of oral health care among DM patients in Chennai at Health care centres from January to June 2022.

The study population included all diabetic mellitus patients fulfilling the below mentioned inclusion criteria and those who visited the health care centre during this study period.

Inclusion criteria

Patients who were diagnosed with diabetes mellitus and undergoing treatment for the same. In addition, patient diagnosed with diabetes mellitus who were willing to participate in the study were included.

Exclusion criteria

Patients with mental health problems, hearing impairments, patients who were unable to provide the appropriate information and those not willing to participate in the study.

Sample size and sampling technique

The sample size included questionnaires from 500 patients. A simple random sampling technique was used to select the study participants.

Data collection procedure

A questionnaire, specifically designed for this study has been used to assess the knowledge, awareness, and oral hygiene practices of diabetic patients, along with the corresponding demographic data. The questionnaire was prepared, first in English, and then, it was translated into local language i.e., Tamil to collect the data (Table 1).

Table 1: Questionnaire.

1) Do you know which type of diabetes you have? If yes, please mention the type a) Yes b) No	**7) Are you aware that healthy gums can be maintained by controlled diabetes?** a) Aware b) Not aware c) Somewhat aware
2) Diabetes is associated with Oral complication a) Agree b) Disagree c) Not Sure	**8) Have your physician advised you to visit a dentist for Oral Health Care?** a) Advised Regularly b) Advised once or twice c) Never Advised
3) According to you, which Oral condition do you feel may be associated with diabetes? a) Dental caries b) Periodontal disease (gum problem) c) Dry mouth d) Oral fungal infection e) All of the above	**9) Do you have any other problems like dry mouth problem/burning sensation etc? If yes, specify:** a) Yes b) No
4) Are you aware that diabetes can cause gum problems? a) Aware b) Not aware c) Somewhat aware	**10) What is the mode of oral hygiene do you practice?** a) Tooth brush and paste b) Tooth brush and powder c) Fingers d) Neem stick e) Other
5) Gums problems are the earliest indicator of diabetes. a) Strongly agree b) Disagree c) Not sure	**11) How many times do you brush your teeth in a day?** a) Once daily b) Twice daily c) More than two times d) Occasionally
6) Which of the following gum problem do you have? a) Gums sores/swollen red gums b) Bleeding of gums c) Bad breath d) Pus discharge from gums e) All of the above f) None of the above	**12) Do you use any other oral supplemental cleansing aids (mouthwash, dental floss etc.)? If so, mention the aid used with frequency of usage per day** a) Yes b) No

A group of investigators prepared the questionnaire, based on the variables and objectives of the study and ethical clearance was attained from Institutional Ethical Review Board (IERB). An Informed consent was procured from each participant before the data

collection. The participants recruited for the study were informed about the objectives of the study, together with the assurances of confidentiality.

Data analysis and interpretation

After collecting all the questionnaires, the data was entered in an Excel spreadsheet (Microsoft Excel Version 2017) and subjecting it to statistical analysis by Statistical Package for Social Sciences (SPSS) version 22.

RESULTS

Of 983 patients evaluated in the centre, a total number 500 patients were shortlisted, who met the inclusion and exclusion criteria of the study. Out of 500 patients who participated in this survey, 55% were males and 45% were females. The age range of the participants was 35-85 years, of which the participants in age group: 35- 45 years comprised about 9% of the total, 28% of the participants were between the age group of 46-55 years. A majority of 37% fell in the age group between 56-65 years, 22% comprised in the age group between 66-75 years and a least of 4% in the age group between 76-85 years.

The chi-square test was used to see the significance of participant's awareness of oral complications associated with diabetes. Around 51% of the participants were aware of their type of diabetes and 49% of the participants were not aware of the type of diabetes. With this regard, males (34%) had a statistically significant value than females (17%). There was a strong statistical significance relationship with respect to oral health knowledge among different age groups ($p<0.05$).

On assessing the patient's knowledge towards oral conditions associated with diabetes, only 41% had a knowledge about the correlation of various conditions enlisted in the questionnaire, of which only 19% of the participants were aware of periodontal diseases associated with diabetes per se.

DISCUSSION

The current study used a self-report questionnaire that aimed at determining the knowledge and awareness of oral health care among diabetes patients. About 49% of the respondents were unaware of which type of diabetes they had; this was in divergence with the study conducted by Eldarrat et al, in which around 84% of his study population were aware of the type of diabetes that they were suffering from.[6]

Out of 500 participants, 78% had a good knowledge that healthy gums can be maintained through controlled diabetes. This finding in our study was significantly higher than the study done in Bale Town, Ethiopia (52.5%); Debre Tabor, Ethiopia (49%); Sudan (15%); Malaysia (41.9%); and UAE (33%) etcetera.[7-11] This variation can be attributed to hospital-based study participants and due to better oral health education in health care centers. As opposed to our study, this finding was significantly lower when compared to the study done in Mekelle, Ethiopia (93.7%) (Table 2).[12]

Table 2: Comparison of studies pertaining to "healthy gums can be maintained through controlled diabetes".

Author's name	Place and year of study	Results
Badruddin et al[13]	Pakistan, 2002	13%- good knowledge
Al-Maskari et al[11]	UAE, 2013	33%- good knowledge
Asmamaw et al[8]	Debre Tabor Ethiopia, 2015	49%- good knowledge
Minhat, et al[10] (Rural Population)	Malaysia, 2014	41.9%- good knowledge
Kassahun et al[7] (non-diabetic population)	Bale town, Ethiopia 2016	52.5%- good knowledge
Result of current study - 78% knowledge		

About 61% of the subjects in the present study were aware of the oral complications associated with diabetes. They were aware of oral conditions like dry mouth, dental caries, oral fungal infections and periodontal disease (Figure 1). Yet, this finding was lower than the studies conducted in Pakistan (68%), where a similar study population was selected.[1]

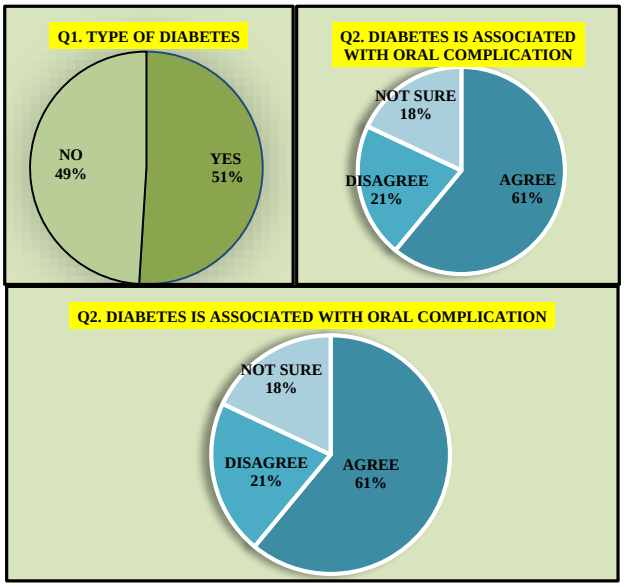

Figure 1: Knowledge and awareness about DM and its oral complications.

Those with diabetes have a greater rampancy and severity of periodontal disease when compared with subjects without diabetes.[13] In the present study, around 57% of the subjects were aware of the gum problems associated with diabetes mellitus (Figure 1). The prime reason for

this is the oral education received by the participants in the form of advertisements in hospitals, pamphlets and access to health magazines. Unfortunately, around 33% of the participants in our study were not frequently educated regarding the impact of oral health conditions on systemic health by their physician.

However, few studies such as, those conducted in USA and Brazil indicated that majority (77% and 65.5% respectively) of patients were advised by health professionals for dental checkups.[14]

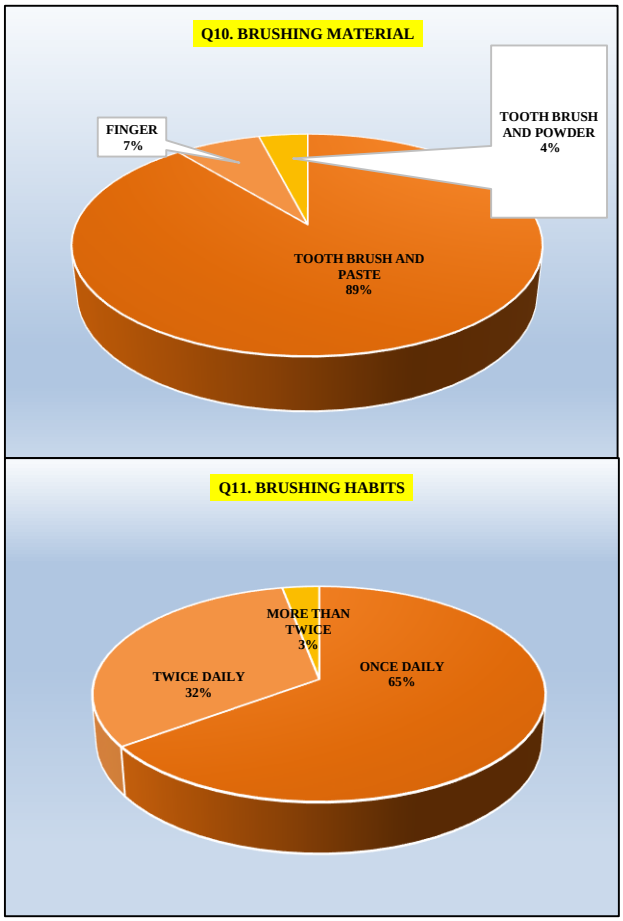

Figure 2: Practice of oral health care among DM patients.

Finally, the oral hygiene care practice at home is of paramount importance in patients with diabetes mellitus to maintain a good oral health. In our study, 89% of the individuals used a toothbrush and a toothpaste for brushing. About 32% of the participants had a habit of brushing twice daily as opposed to brushing only once daily (65%) (Figure 2). When asked about the usage of any other interdental cleansing aids; only 15% have been regularly using some form of aid such as dental floss, untufted brush and Water floss. This can be attributed to the education offered by the patient's dentist or due to the educational content in the diabetic centre, which would have developed a sense of oral hygiene maintenance in these patients. Nevertheless, the percentage of population with DM following these oral hygiene practices were less.

CONCLUSION

In the current study, patient's knowledge regarding their type of diabetes, link between oral health and overall health was considerable. Majority of the participants were using toothbrush once daily for oral care. Awareness about interdental aid usage also was low. Diabetes mellitus may be regarded as one of the most dreaded and silent epidemic health problem in the immediate future, especially in the developing countries. Therefore, it is of paramount importance to know about the increased risk of oral diseases in diabetes mellitus.

Further studies should be conducted in different parts of India with larger population to provide a better knowledge and awareness of the people regarding the oral complications associated with diabetes. The current urban centric study showed that the majority of the patients did not receive any oral health information from general physicians or diabetes care providers.

In the near future, it is the responsibility of the dental professionals to organize more dental health campaigns and awareness about the importance of good oral health in DM.

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