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ORAL SELF-CARE AMONG DIABETIC PATIENTS VISITING DIABETIC CENTRES IN SOUTH INDIAN CITY, GUNTUR: A CROSS SECTIONAL STUDY

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ABSTRACT

Purpose: to evaluate oral health behavior and its determinants among diabetic patients visiting diabetic centres in Guntur city.

Materials and Methods: A Cross sectional study was conducted on a sample of 162 diabetic patients visiting all the seven diabetic centres in Guntur city. A Self-administered pre-tested questionnaire was distributed randomly and CPI and dentition status were recorded for each patient. Statistical analysis was done using SPSS version 20. **Results:** 19% of the subjects visited dentist within the last year and the main reason for their visit was pain. The awareness of diabetic patients of their increased risk for oral diseases was low compared to their awareness of systemic diseases. A significant association was found between duration of diabetes and dental problems. **Conclusion:** Health professionals in both the dental and medical fields need to develop programs to educate the public about the oral manifestations of diabetes.

KEYWORDS: Diabetes mellitus; oral self-care; oral diseases

INTRODUCTION

Diabetes Mellitus is a global problem with a devastating human, social and economic impact. The Prevalence of diabetes is growing rapidly and is reaching epidemic proportions. Today there are more than 285 million people world wide with diabetes and has been estimated to reach 438 million by the year 2030.^[1] In India the prevalence was 51 million in 2010 and estimated that it would rise to 87 million in 2030.^[2] Diabetes is known to cause systemic and oral

complications especially in diabetics who do not have proper control over their blood glucose levels. Orally, diabetes is linked to a multitude of manifestations. Uncontrolled and longstanding diabetes can affect the salivary glands resulting in Xerostomia. When the salivary flow is significantly reduced in Xerostomia, the oral cavity is deprived of the beneficial properties of saliva which leads to the accumulation of plaque and debris. This could be a contributing factor in diabetics increased risk for dental caries. Lack of saliva also allows the growth and adhesion of yeast which causes fungal infections.^[3,4] Periodontitis is one of the widely discussed oral manifestations of diabetes mellitus. Adults with diabetes have both higher prevalence and more severe forms of periodontal diseases.^[5] In particular, Individuals who fail to maintain good oral hygiene are at higher risk for periodontal diseases. This risk seems to be lower for subjects who control both their diabetes and dental plaque by maintaining comprehensive self care. In addition, regular dental visits provide opportunities for professional care in prevention, early detection and treatment of periodontal diseases. Because of the established relationship between diabetes and oral diseases, prevention and treatment involving consistent daily oral self care and regular dental visits are particularly important for diabetic patients. Despite the increased risk of oral diseases among diabetics their oral self care and use of dental services have been scarcely studied. The aim of the present study was to evaluate oral health behavior and its determinants among diabetic patients visiting diabetic centres in a South Indian city, Guntur.

Materials and Methods

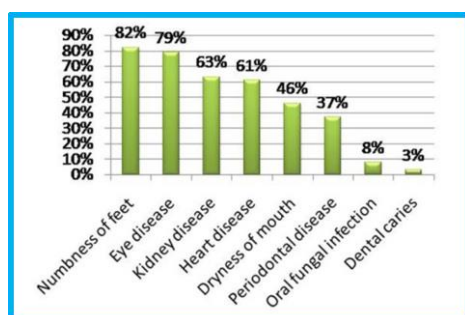
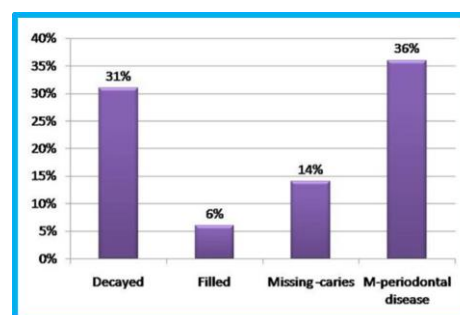
A hospital based cross sectional study was carried out on a convenience sample of 162 diabetic

Table 1: Distribution of study subjects according to CPI scores by duration of diabetes

Duration of diabetes	Healthy	Bleeding	Calculus	Pocket 4-5mm	Pocket 6mm or more
Less than 7 years	20(28.6%)	8(11.4%)	26(37.1%)	7(10%)	9(12.9%)
7 to 12 years	3(10.7%)	3(10.7%)	8(28.6%)	9(32.1%)	5(17.9%)
Greater than 12 years	0	1(6.2%)	3(18.8%)	6(37.5%)	6(37.5%)

Table 2: Distribution of study subjects according to loss of attachment scores by duration of diabetes

Duration of diabetes	0-3mm	4-5mm	6-8mm	9-11mm	>12mm
Less than 7 years	34(47.8%)	31(44.3%)	4(5.7%)	2(2.4%)	1(0.6%)
7-12 years	7(25%)	16(57.1%)	5(17.9%)	1(1.6%)	0
Greater than 12 years	2(12.5%)	10(62.5%)	4(24.9%)	0	0

**Graph 1:** Awareness of medical and oral complications associated with diabetes**Graph 2:** Distribution of study subjects based upon dentition status scores

patients visiting all the seven diabetic centres in Guntur city in a period of 1 week. Ethical clearance was obtained from the Institutional review board of Sibar Institute of Dental sciences. Permission to examine the patients was obtained from the concerned authorities of the Diabetic centres. Patients of all age groups who had confirmed diagnosis of diabetes mellitus were included in the sample. Any patient with apparent physical or mental handicap was excluded. A Questionnaire was designed to assess the awareness, attitude of Diabetic patients along with demographic variables. Questions are grouped into 5 categories. Social background, Medical history, Utilization of dental services, Awareness and attitude of Diabetic Patients towards oral health and their sources of information on oral health. Questionnaire was pretested on a sample of 30 patients. Informed consent was taken from each eligible participant before administration of the questionnaire during visit to each diabetic centre and patients who agreed to participate in the study were provided with the questionnaire. Completed questionnaires were collected from all the participants. ADA Type III dental examination^[6] was carried out. Instruments used were mouth mirror and CPI probe. Periodontal status was assessed by using

Community Periodontal Index and caries status by Dentition status and treatment needs.^[7] Statistical analysis was done using SPSS version 20. Data were analyzed for frequency distributions and chi-square test was used to find the significance of association between CPI score, loss of attachment and duration of diabetes. Level of significance was set at $P < 0.05$.

RESULT

Among the diabetic patients participating in this survey, 68 were males and 94 were females. The age of the participants ranged from 38 to 85 years (Mean age is 57.2 ± 11.1 years). The length of the time since participants had been diagnosed as diabetic ranged from 1 week to 40 years. Of the participants, 24% were smokers and 76% were non smokers. Most of the patients in the present study belong to upper lower class. Awareness of participants of their increased risk for medical and dental complications is shown in Fig. 1. Of all the subjects, 42% reported brushing on a twice daily basis and 57% once daily. Twice daily tooth brushing was more frequent among women than men. 19% of respondents had visited dentist within the last year. 32% reported that they had visited within the last five years, and 16% had not visited dentist for more than five years. The prevailing reason for the most recent dental visit

was pain followed by oral prophylaxis and regular dental checkup. As for the sources of information for participants of their increased risk for oral diseases, 25% of the participants had received this information from their dentist, 10% from physician, 2% from newspaper and 62% did not receive any information. Distribution of study subjects according to CPI score and loss of attachment by duration of diabetes is shown in Tables 1 and 2. Duration of diabetes was significantly associated with CPI scores and loss of attachment. The prevalence of decayed, missing due to caries, missing due to periodontal disease and filled teeth is shown in Fig. 2. The mean number of decayed, missing due to caries, missing due to other reasons and filled teeth was 2.84 ± 1.7 , 2.52 ± 1.5 , 7.30 ± 7.8 and 2 ± 0.9 respectively. According to treatment needs, the percentage of subjects who require one surface filling, two surface filling, pulp therapy and extractions is 5.6%, 6.8%, 9.3% and 28% respectively.

DISCUSSION

The present study was done to evaluate oral health behavior and its determinants among diabetic patients visiting diabetic centres in a South Indian city, Guntur. Oral diseases are increasingly considered as behavioral diseases. Adopting healthy habits, including sufficient oral self-care and regular dental visits is essential to control such diseases. Good oral health strongly depends on attitude and personal care such as oral self-care and regular dental visits. So, the prevention and treatment of oral diseases as well as diabetes require persistent daily self-care. The inter-relationship between diabetes and oral diseases suggests that routine preventive dental care is important in preventing complications of both diseases. One of the most important findings of the present study is that the awareness of diabetic patients of their increased risk for oral diseases such as periodontal disease, dryness of mouth, tooth decay and fungal infection was low compared to their awareness of systemic diseases. Similar findings were reported by Allen *et al.*, 2008^[8] and Eldarrat 2010.^[4] This study also reveals the additional important finding that diabetic patients have limited awareness of the harmful consequences of mouth dryness on their oral health. A significant reduction of salivary flow leading to mouth dryness is the most

common oral manifestation of diabetes. It is very important to inform diabetic patients about the beneficial properties of saliva and the necessity of keeping the oral cavity moist through frequent water intake. Saliva's function of washing and cleaning the oral cavity is known to prevent accumulation of plaque and debris, which could be a contributing factor in diabetic's increased risk for periodontal disease and dental caries.^[3] Regarding their oral self-care, the rate of twice daily tooth brushing among the subjects in this study was 42%; twice daily tooth brushing was more frequent among women than men. More than half of participants (78%) never used dental floss to clean between their teeth. This is in accordance to the study conducted by Bakhshandeh *et al.*, 2008.^[9] The data of the present study showed that 19% of participants had visited dentist within the last year which was very low when compared to the respective rate in Kariskoski *et al.*, 2002^[10] study and the main reason for their visit was to receive treatment for pain and discomfort. In this study, reporting a dental checkup as a reason for the most recent dental visit was very rare. The results of this survey showed that the information regarding participants increased risk for oral diseases associated with diabetes was obtained from dentist (25%), physician (11%) and Newspaper (2%). 61% didn't receive any information. So, it is of paramount importance for dental professionals to raise diabetic patients' awareness of their increased risk for oral diseases and of the impact of oral health on their general health. Many studies reported that duration of diabetes was a significant factor for the severity of periodontal disease.^[11-20] Longer the duration of diabetes, greater is the severity of periodontal disease which is similar to the results found in the present study. The prevalence of decayed teeth in the present study was 31%. This finding raises the question as to why adult diabetics develop as many new carious lesions as their healthy counterparts in spite of the restricted diet. Diabetic patients may have more frequent meals than normal subjects and repeated intakes of even small amounts of carbohydrates may be cariogenic.^[21,22] The mean number of teeth missing due to other reasons among diabetics was significantly higher in the present study. The 'other reason' considered in this study was

missing due to periodontal conditions. Research projects have shown that early detection and treatment of dental caries, periodontal disease and other oral diseases would be of enormous benefit in protecting patients from the harmful oral complications associated with diabetes.

CONCLUSION

Oral self-care among adults with diabetes does not seem to be consistent with the increased risk for oral diseases. Diabetic patients were found to have little awareness towards their increased risk for oral diseases and longer the duration of diabetes, greater is the severity of periodontal disease. In order to promote proper oral health and to reduce the risk of oral diseases, health professionals in both the dental and medical fields need to develop programs to educate the public about the oral manifestations and complications of diabetes.

CONFLICT OF INTEREST & SOURCE OF FUNDING

The author declares that there is no source of funding and there is no conflict of interest among all authors.

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