
ORIGINAL ARTICLE**Survey on Awareness and Knowledge about the Effect of Diabetes Mellitus on Systemic and Oral Health in Patients Visiting General Medicine Outpatient****Department in Dental Hospital***Shantala Arunkumar¹*, Shyam Amur², Uday Sambrani², Krishna M Burde¹**¹Department of Oral Medicine and Radiology, ²Department of General Medicine, SDM college of Dental Sciences and Hospital, Sattur, Dharwad-580009 (Karnataka) India*

Abstract:

Objective: This survey was conducted on known diabetic patients to appraise the awareness and knowledge about the effect of diabetes mellitus (DM) on systemic and oral health and to evaluate the source of the information. *Aim:* The aim of this study was to gather baseline information on awareness and knowledge of diabetic patients regarding their systemic and oral health with the view of enhancing their oral health education. Which will help in updating their knowledge regarding strong association of DM on oral diseases, also about importance of maintaining glycemic levels and good oral health. *Methodology:* This experimental study was conducted on known diabetic patients visiting general medicine outpatient department for fitness to undergo dental treatments. Patients were evaluated by using a self developed questionnaire by interview method. The questions were about awareness regarding effect of DM on systemic and oral health, sources of information patients have received and elicit the symptoms of DM in those diabetics and educate them regarding importance of glycemic control and maintenance of oral health. *Results:* All the participants had Type 2 DM. The knowledge about DM disease was poor and most of them attended camps related to DM and their systemic consequences, but none of them attended DM associated oral health camps. Many patients

(47.5%) were educated about the effect of DM on systemic organs and their prevention, by their treating physician, but none of the physicians informed about effect of DM on oral tissues (0%). Surprisingly, only some dentists (24%) told regarding oral complications of DM, large number of patients gathered information by other sources mainly from relatives and friends, who are diabetics (61.9%). So awareness of diabetic patients of their increased risk for oral diseases is low compared to their awareness of systemic diseases. *Conclusion:* It is of paramount importance for dental specialist to raise the attentiveness of diabetic patients of their increased risk for oral diseases and the impact of oral health on their general health. Research project on awareness for diabetic patients of their increased risk for oral and dental diseases and their approach to maintain good oral health will significantly impact their oral health-related quality of life.

Keywords: Diabetes Mellitus, Systemic Health, Oral Health Awareness, Dental Diseases

Introduction:

Diabetes mellitus has been increasing at such an alarming rate worldwide that recently the World Health Organization (WHO) declared the disease an epidemic. The number of estimated cases of diabetes has increased from 30 million in 1985 to

135 million in 1995, and is projected to increase to 366 million by the year 2030 [1].

In addition to the more common complications that arise as a result of this disease, diabetic patients who do not carefully control their blood glucose levels will be at high risk of systemic and oral complications. The most common chronic manifestations are macrovascular diseases and include coronary artery, peripheral vascular and cerebrovascular diseases.

Additionally, microvascular complications manifest as retinopathy, neuropathy, and nephropathy among others [2].

In addition to these, oral complications in the form of gingivitis, periodontitis, multiple periodontal abscesses and salivary gland dysfunction leading to qualitative and quantitative (xerostomia) alterations of saliva, in turn predispose the oral cavity to opportunistic infections like candidiasis, greater accumulation of plaque, delayed wound healing, oral paraesthesia and altered taste etc [3,4]. Among all oral diseases, periodontitis (destruction of the supporting structures of the teeth i.e., periodontal ligament and alveolar bone), is a common predicament in diabetics and is the main cause for early loss of teeth, alteration in the oral physiological functions such as mastication and affects the digestive function. So many patients shift to soft diet containing high sugars and end up with dysglycemias.

Many studies have proved a bidirectional adverse relationship between diabetes and periodontal disease; diabetes can aggravate periodontitis, and periodontitis can negatively affect control

of diabetes. There is a clear relationship between degree of hyperglycemia and severity of periodontitis [5, 6]. The mechanisms that underpin the links between these two conditions are not completely understood, but involve aspects of immune functioning, neutrophil activity, and cytokine biology. There is emerging evidence to support the existence of a two-way relationship between diabetes and periodontitis, with diabetes increasing the risk for periodontitis, and periodontal inflammation negatively affecting glycemic control. Furthermore, the risk of cardiorenal mortality (ischemic heart disease and diabetic nephropathy combined) is three times higher in diabetic people with severe periodontitis than in diabetic people without severe periodontitis [7] and this is the main cause of tooth mobility and loss, this compromises the masticatory efficiency and DM patients cannot eat solid fibrous diet, as they should not take soft food containing high glucose.

Patients obey oral health care regimens when educated and positively reinforced. Lack of awareness about dental health is the reason for non-adherence to oral hygiene practices in this country due to illiteracy, economical constraints lack of facilities and lack of proper guidance by treating physician or dentist. The motives prompting people to seek preventive dental care include the beliefs that one is susceptible to dental disease that dental problems are serious, and that dental treatment is beneficial. Those who believe that they are highly susceptible to dental disease make more preventive dental visits.

Health education attempts to change behaviors by altering an individual's knowledge, attitudes, and beliefs about health matters [4,6]. Therefore, this study was carried out to raise awareness of diabetic patients about oral health using questionnaire by interview method in a dental institution.

Material and Methods:

This study was a cross sectional descriptive survey of 185 diabetic patients visiting Outpatient Department of General Medicine for systemic examination before undergoing dental treatments in a dental institution. Inclusion criteria were patients diagnosed with DM of all ages for at least 6 months with or without associated other systemic diseases and on treatment for the same. Diabetic medical personnel or who were apparently mentally handicapped and patients who were not willing to participate in the study were excluded from the study.

A self questionnaire was designed to assess the awareness and knowledge of diabetic patients about impact of DM on systemic and oral health by interviewed method. Questionnaire questions were carefully selected from relevant published reports in various journals. The questions were grouped into 3 categories and patients were answered by saying either yes/no to the questions as it is given in Box.1.

After taking informed consent from each eligible participant, willing participants were informed in detail about the research project and its consequences and ethical clearance was obtained

by institutional ethics committee. The privacy of the patients was ensured during filling of questionnaires, demographic details, educational status, medical history, current Random Blood Sugar (RBS) levels and reason for visiting dental hospital etc were recorded. The investigators asked the questions verbally in local language and questionnaire was filled in English language. The questions were about awareness and knowledge about effects of DM on systemic and oral health, whether they attended any diabetic awareness camps about systemic and oral complications, they got any other sources of information from electronic or printed media. They have any oral manifestations of diabetes and associated concerns (teeth or gum disease or mucosal infections etc.).

At the end of completion of questioning, all the participants were educated about the impact of diabetes and importance of glycemic control on oral health and significance of periodic dental checkup and treatment etc. The collected data was subjected for statistical analysis by using SPSS version 20 and results were drawn.

Results:

In the present study mean age of the sample was 57.70 ± 1.14 years. Out of total 185 patients 105(58%) were males and 80(42%) were females, all patients were suffering from Type 2 DM, with the duration of 8.82 ± 4.10 years. Among this 106(57%) patients RBS within normal range and 78(43%) had uncontrolled RBS levels. The educational status of patients were assessed,

16(8.7%) were illiterates, 96(52.2%) were school dropouts and 72(39.1%) were educated. The reason for visiting dental hospital, 102(55.4%) patients had teeth problems, 76(41.3%) gum diseases, 7(3.5%) had mucosal diseases.

Regarding questions on knowledge and awareness about effect of DM on systemic and oral tissues and its complications, out of 185 patients, 130 patients didn't know that diabetes is a hereditary disease; only 55 patients new that DM is hereditary, as their parents had DM or some are came to know by other sources. The knowledge about the effect of DM on oral tissues, only 20 patients were aware and 165 patients did not know about this issue. 24(13%) patients attended camps related to effect of DM on general health and 159(87%) patients did not attended any camps. 16(8.7%) patients had attended camps related to effect of DM on oral health and 161(91.3%) patients not attended any oral health camps.

Questions regarding sources of information about consequences of DM on systemic or oral tissues, 88(47.5%) patients had got health education (HE) by their treating physician on systemic health and 96(52.2%) had no information and none (0%) of them were informed about oral complications by physician. Surprisingly, only 24(13.0%) patients were informed about effect of DM oral tissues and importance of maintenance of oral health by their dentist and 160(87.0%) patient were not informed anything like that. 72(39.1%) patient had got some information from electronic and/or

printed media and 103(61.9%) patients from their DM friends and relatives (Table.1).

Table 1: Sources of Information about Effect of Diabetes Mellitus on Oral Tissues

Sources of information	Percentage(%)
Treating Physician	0 %
Treating Dentist	24%
Diabetic friends or relatives	61.9%
Electronic or printed media	39.1%

The questions about patients suffering from oral problems at the time of interview, 30(16.3%) had teeth problems, 113(61.4%) gum related problems and 41(22.3%) patients mucosal problems (Fig.1). We gave health education to all the participants and later asked about opinion regarding the same, 48(26.1%) patients were mentioned as good and informative, 136(73.9%) patients told, it was very good and informative.

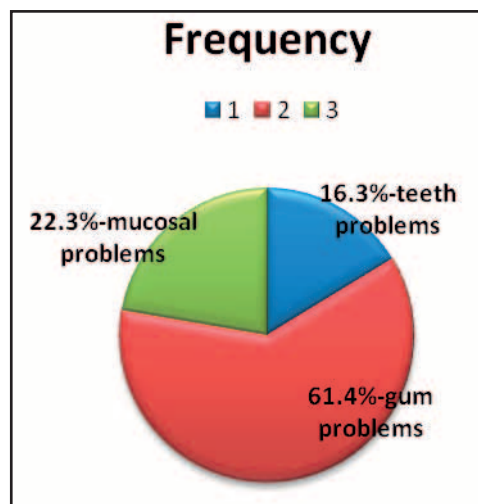


Fig 1: Frequency of Oral Problems in Percentage among DM Patients

Discussion:

The data obtained in this study clearly demonstrated that diabetics have more knowledge about their increased risk for systemic complications associated with DM than oral and dental complications, because 150(81%) patients answered that uncontrolled DM has effects on systemic organs such as eyes, kidneys and brain, but only 10(5.4%) knew that DM also affects the mouth in the same way. More than 22% of the participants were suffering from mucosal problems and were unaware of harmful effects of xerostomia on their oral health. It is well known that a significant reduction of salivary flow is the most common oral manifestation of diabetes. Saliva plays an important role in cleansing of oral cavity and in preventing the accumulation of plaque and debris, which would be contributing factors in diabetics' increased risk for periodontal disease and dental caries. In addition, saliva has antimicrobial actions, when blood and saliva glucose concentrations are high; it allows the growth of *Candida* organisms. So diabetics should be educated about importance for keeping the oral cavity moist by stimulating salivary flow and frequent sips of water [1].

As 24(13%) patients attended DM camps related to systemic health and only 8(4.3%) patients attended DM camps on oral health, this shows there are camps on DM conducted by medical personnel but in those camps no importance was given for oral health and none of the camps were purely on oral health. In our study 16(8.7%) of the patients were illiterate such patients are the

most benefited by health awareness programs, who otherwise cannot get information from printed media.

The percentage of participants who were aware of their increased risk for systemic complications was 88(47.5%) patients and was informed by their physician but no emphasis was given on effects of DM on oral tissues. Surprisingly, only 24(13.0%) of patients were informed about DM and oral tissues and importance of maintenance of oral health by their dentist and 160(87.0%) of patients were not informed anything about, this results are awful because DM has serious and irreversible effect on most of the oral tissues and most of the dentists are well aware of it, but still not given any details about it. Similar study was carried out by Mirza *et al* in Lahore showed that knowledge and awareness about oral health were not as good as seen in our study. Identical findings were reported by several researchers, who assessed the knowledge of diabetics on their risk for periodontal disease, their attitude toward oral health and their oral health-related quality of life. Researchers found that 98% of the participants were aware of their increased risk for systemic disease and only 33% for periodontal disease [5].

Even in our study, the prevalent oral complaint was gum diseases 113(61.4%), it is a proven fact that destruction of periodontal tissues is most widely noted oral complication of DM. In fact several researches have advanced the notion that there is a bidirectional relationship

between periodontitis and diabetes mellitus [6]. In our group of patients also 113(61.4%) patients had gum related problems and were deprived of eating healthy diabetic diet and all of them had very limited knowledge of the associations between oral health and overall health, this has negative consequences on their glycemic control, general health, and health-related quality of life. American Diabetes Association introduced periodontal disease as the sixth complication of diabetes in 1997. Diabetes is a disease that may reduce the tissue resistance around the teeth (gingiva and bone) against microbial activity, which probably occurs due to impaired immune cell response, these complications may also be related to the development of microangiopathy in the oral tissue [7,8].

At the end of the survey, we counseled all participants regarding oral complications of DM and importance of periodic dental check-ups and home care measures and asked about the attitude about HE given by us, 48(26.1%) patients were mentioned it as good and informative, 136(73.9%) patients told that it was very good and informative for them. None of the health care professionals had educated them. On the other hand, patients felt that they would have been more careful about their oral health, if they would

have been informed earlier in the disease stages. It shows the importance and positive impact of health counseling by dentists. If medical practitioners also possess basic dental knowledge to uncover signs and symptoms from patients, it can provide appropriate treatment and help the patient for better glycemic levels, in turn prevent the mortality and morbidity of the patient.

Conclusion:

As DM patients should be on strict sugar free diet containing supplementary fibrous food to retain their blood glucose levels within normal, for this maintenance of healthy oral tissues and their masticatory functions are very important. The DM is a metabolic disease once the patient is diagnosed with it, if patient is educated about impact of DM on systemic and oral health can be more informative and prevent the morbidity of the patient.

Health professionals in both dental and medical fields need to develop camps to educate the public about systemic and oral manifestations of diabetes and its complications. In addition, regular dental visits provide opportunities for professional care in prevention, early detection and treatment of oral diseases are particularly important for diabetic patients.

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