

Original Research Article

An Insight into Knowledge, Attitude and Awareness of Oral Health among Diabetic Subjects in Puducherry – A Questionnaire StudyAnitha K^{1*}, Sakthi Devi S¹, Aravind V¹, Ramesh Babu MR², Premalal KR³¹Department of Periodontology and Implantology, Indira Gandhi Institute of Dental Sciences, Puducherry, India²Department of Oral and Maxillofacial Surgery, Mahatma Gandhi Post Graduate Institute of Dental Sciences, Puducherry, India³Department of Oral Pathology and Microbiology, Indira Gandhi Institute of Dental Sciences, Puducherry, India***Corresponding author**

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Abstract: Diabetes mellitus is a metabolic disorder associated with a wide range of complications with increased morbidity and mortality in affected individuals. Ignorance regarding the oral and systemic signs and symptoms of diabetes is prevalent in our society. Studies addressing the awareness levels of oral and systemic diabetic manifestations are inadequate. The aim of the study is to assess the knowledge, attitude and awareness about general and oral complications and the oral hygiene practices among diabetic subjects in Puducherry. The study was designed based on Questionnaire. The study was conducted in the government & private hospitals in union territory of Puducherry. 200 Diabetic Subjects (103 males and 93 females) who volunteered to complete the questionnaire were recruited. The frequency distribution was obtained. The Diabetic subjects in Puducherry were not aware of the oral complications caused due to Diabetes, their attitude to maintain good oral hygiene was also very poor. 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 take the responsibility to develop programs to educate the public to create awareness on regular dental visits.

Keywords: Diabetes Mellitus, Periodontal Disease, Oral health, Attitude, Awareness, Knowledge, Questionnaire study

INTRODUCTION

Diabetes mellitus is a clinically and genetically heterogeneous group of metabolic disorder characterised by abnormal increase in blood glucose level [1]. Apart from the other micro and macro vascular complications of diabetes, now periodontitis is considered as the sixth complication [2, 3]. Studies have proven that there is a bidirectional relationship between Diabetes mellitus and Periodontal Disease [4-6]. Diabetes is a growing problem worldwide and it affects 5 % of world's population [7]. WHO has projected that prevalence of Diabetes is increasing in epidemic proportion especially in developing countries. India is being called the diabetic capital of the world as over 30 million people are affected [8]. Asian Indians tends to have greater waist circumference and waist Hip ratio, thus having greater degree of central obesity [9]. They also have more visceral fat for any given BMI and have greater insulin resistance [10, 11]. This deformity is considered to be the important precipitating factor that contributes for increased prevalence of Type II Diabetes.

The International Diabetic Federation also reported that the total number of diabetic subjects in India was 41 million in 2006 and may rise to 70 million by the year 2025 [12]. Taking Pondicherry into consideration there has been an increase in the prevalence of diabetes over a period of time from 1.8% in 1984 to 8.9% in 2008 [13]. Diabetes is a growing problem worldwide, population at large are unaware of the oral and systemic complications of the same. This can be attributed to illiteracy, economical constrains, ignorance and lack of proper guidance [14].

Even though extensive studies had been carried out in various populations worldwide regarding the prevalence and severity of periodontitis in type II diabetes mellitus, only limited studies have been done in India [15,16]. It was proved that diabetic subjects manifested relatively higher prevalence and severity of periodontal disease when compared with nondiabetics. Worsening of glycaemic control, severity of periodontitis significantly increases hand in hand.

Taking these facts into consideration, the purpose of the current study was to assess the knowledge about the oral and systemic complications of Diabetes Mellitus, the extent and sources of awareness and the attitude towards oral hygiene maintenance in Pondicherry population.

MATERIAL AND METHODS

A multi-centred study was conducted in the government & private hospitals in union territory of Pondicherry. 200 Diabetic Subjects (103 males and 93 females) who volunteered to complete the questionnaire were recruited. Subjects who were diabetic (Type I and Type II) for at least 6 months with minimum of 10 natural teeth were included in this study. Mentally or physically challenged subjects and edentulous subjects were excluded from the study.

The questionnaire consisted of 19 closed ended questions and covered information about the age, sex and their duration of diabetes, family history, diabetic control, awareness of oral and systemic complication and the source of awareness, the maintenance of oral

hygiene, and regularity of dental visits. The questionnaire was translated in the local language for their better understanding. The diabetic control was assessed by HbA1c (glycosylated hemoglobin) levels taken at the time of study.

The data collected over a period of 3 months was subjected to statistical analysis using statistical package for social science(SPSS ,version17:IBM SPSS Inc. Chicago, Illinois) software and the frequency distributions were obtained.

RESULTS

A total of 200 diabetic subjects participated, 97 [48.5%] were females and 103[51.5%] were males and 65 males, 37 females were educated and 38 males and 60 females were uneducated (Figure 1) out of which 9.5% were diabetic for the past 2years, 32.8% were diabetic for 3-5 years and 58% were diabetic more than 5 years. 34 % of the subjects were in good control of diabetes, 32.5% of the subjects were in moderate control and 33.5% were in poor control. [Table1].

Table 1: Baseline Data of diabetic subjects participated

| Characteristic | Frequency |
|-----------------------------|-----------|
| Gender | |
| No of males | 103\200 |
| No of females | 97\200 |
| Duration of Diabetes | |
| Below 2 years | 19\200 |
| 2-5 years | 65\200 |
| Above 5 years | 116\200 |
| Family History | |
| Yes | 147\200 |
| No | 53\200 |
| Control of Diabetes | |
| Good Control | 68\200 |
| Moderate Control | 65\200 |
| Poor Control | 67\200 |

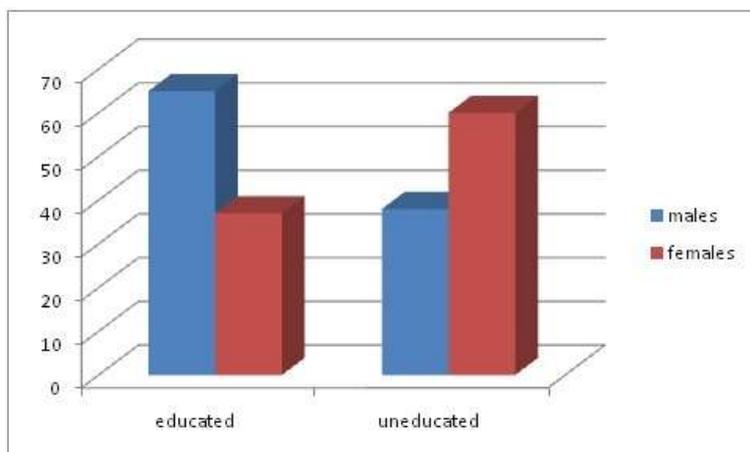


Fig 1: Male and female distribution

The subject's knowledge about the various systemic complications and oral complications caused

due to diabetes is shown in Table 2, Fig 2 and Fig 3.

Table 2: Knowledge about effects of diabetes on systemic and oral health

| Complications | Frequency | |
|-----------------------|-----------|-----|
| | Yes | No |
| Systemic | | |
| Eye | 107 | 93 |
| Kidneys | 78 | 122 |
| Heart | 27 | 173 |
| Foot | 134 | 66 |
| Oral | | |
| Swollen Gums | 86 | 114 |
| Oral Malodour | 125 | 75 |
| Loosening of Teeth | 44 | 156 |
| Altered Wound Healing | 15 | 185 |
| Bleeding Gums | 21 | 179 |

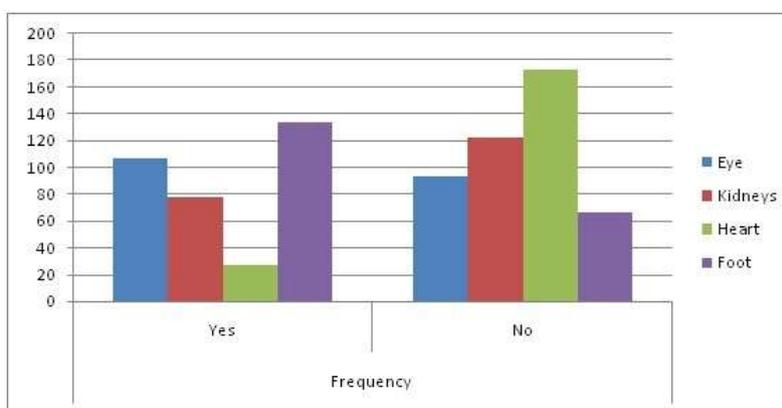


Fig 2: Systemic complications

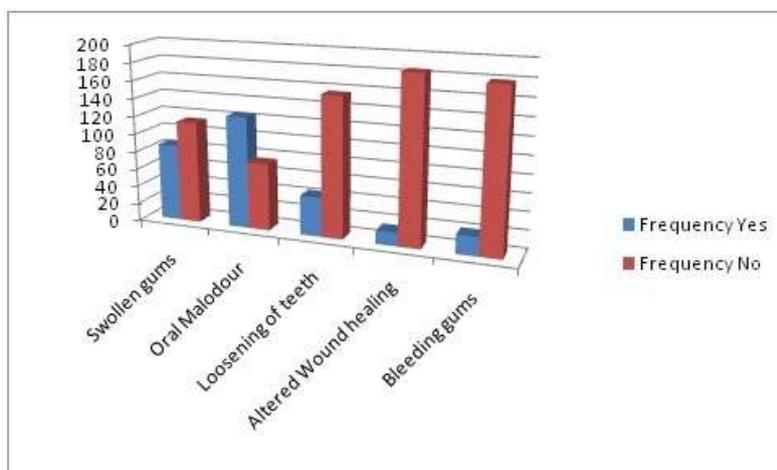


Fig 3: Oral complications

Table 3 shows the source of awareness wherein 25% of the subjects were enlightened by the general physician, 15% by the dental surgeons and 5%

through the media and internet. The greater portions of subjects (55%) were unaware of the complications of diabetes.

Table 3: Data on source of getting information in diabetic subjects

| Source | Frequency |
|---|-----------|
| Television | 7/200 |
| Medical Practitioner | 71/200 |
| Dental Surgeon | 30/200 |
| Nil | 90/200 |
| Willing to Know more on Diabetes | |
| Yes | 186 |
| No | 14 |

Table 4 shows that the control of diabetic status has an effect on oral health about which 29.5% subjects were aware and 61.5% were unaware. 28% of the

subjects were aware that good oral health helps in controlling diabetes whereas 72% were unaware.

Table 4: Knowledge of diabetic status on oral health

| Effect of diabetic status on oral health | Frequency |
|--|-----------|
| Aware | 7/200 |
| Unaware | 123/200 |

Regarding the subjects attitude for maintenance of oral hygiene only 3% of the subjects brush twice a day and 97 % brush once daily, 90% of the subjects had not used interdental cleansing aids and

10% used interdental cleansing aids. 89% used tooth paste for cleansing their teeth &12% had not used toothpaste [Table 5].

Table 5: Oral hygiene practices of diabetic subjects in maintaining good health

| Oral Hygiene Practices | Frequency |
|--------------------------------|-----------|
| Frequency of brushing | |
| Once Daily | 194/200 |
| Twice Daily | 6/200 |
| Use of mouth Wash | |
| Yes | 147/200 |
| No | 53/200 |
| Use of Interdental Aids | |
| Yes | 30/200 |
| No | 170/200 |
| Type of Tooth Paste | |
| Branded | 160/200 |
| Non Branded | 40/200 |
| Type of Tooth brush | |
| Soft | 28/200 |
| Medium | 150/200 |
| Hard | 22/200 |

Regarding the subjects visit to the Dental clinic 6.5% visited 6 months before, 41.5% had visited 1 year before and 52% had not visited dental clinic for regular Dental checkups. The reason for visiting the

dental clinic was primarily to get relieved from tooth ache (45%), for scaling (40 %), and for restoration (15%) [Table 6].

Table 6: Attitude of diabetic subjects in maintaining good oral health

| Last Visit to Dentist | Frequency |
|-----------------------|-----------|
| Within 6 Months | 13/200 |
| Before 1 Year | 82/200 |
| Not Visited | 105/200 |

DISCUSSION

A total of 200 diabetic subjects in different centres in Pondicherry were enrolled in this study. They were subjected to a questionnaire comprising of 19 closed ended questions to assess their knowledge about oral and systemic complications, the extent of awareness about diabetes mellitus and their attitude towards oral hygiene maintenance.

Ismail *et al.*, stated that most subjects were aware about the systemic complications of diabetes involving eyes, heart, kidney and foot [17] which was similar to our study wherein the subjects were equally aware of the systemic complications of eyes, kidney and foot, but not about the cardiac complications. Regarding awareness of oral complications like swollen gums, halitosis, loosening of teeth and bleeding gums, 75% of subjects did not respond to the questionnaire and 25% subjects were aware of the rise of oral complications due to diabetes. This was similar to the studies carried out in other populations. This observation interprets that the diabetic patient has more knowledge about systemic complications associated with diabetes than the oral complications. Several recent studies have also proved the diabetic subjects are less informed by the health professionals about the oral complications [18].

When asked about the source of awareness about oral complications, 25% of subjects had received advice from the medical practitioners, 15% from the dental surgeons and 5% through the media and internet. The greater portions of the subjects (55%) were unaware of the complications of diabetes. This observation is same as the study done by Bowyer *et al.*, in 2011 [19]. The reason could be that the diabetic subjects frequently visit general practitioners than dentists. However few studies on the contrary have shown that the source of information for diabetic subjects regarding their increased risk for oral diseases mainly came from dentist (53%) and other sources such as television, internet, magazines and friends (30- 45%) [18, 20]. This clearly throws light on the fact that dentists can play a role in promoting awareness thus reducing the incidence and adverse impact of diabetes mellitus on oral health [21]. 77 subjects were aware of the facts that good oral health controls the diabetes and 123 subjects were unaware. This finding was similar to the study done by Ismail *et al.*, [17].

In our study only 8% of subjects brushed twice a day and only 10% of subjects used dental floss which is similar to the study done by Ashish [22]. However this was contradictory to the study done by Karikosi *et al.*, [23] who observed in Finnish population that diabetic women were brushing their teeth more frequently than diabetic men and their plaque and calculus index was lower than in men. These observations showed that there is inconsistency in the overall attitude to maintain

good oral hygiene in diabetic subjects in our country when compared to the studies done worldwide mostly in the developed countries and this may be due to lack of motivation and education to improve the oral health .

The frequency of visit to the dental clinic is an inconsistent factor [22, 24]. In our study 6.5% subjects visited dental clinic 6 months before, 41.5% had visited 1 year before and 52% had not visited, the main reason being fear and cost factor. This implies that many of them are ignorant of the importance of regular dental visits and their attitude towards oral health is poor similar to a study done by Karikoski *et al.*, [23]. Hence we should motivate the patient for regular dental check up and sometimes it may be an eye-opener for the early detection of diabetes particularly for those who are unaware of the disease. In most of the cases it has been proved that dental professionals are the first to identify and refer patient to the specialist. Investigators have proved that good oral condition is strongly associated with frequent visit to the dental clinic [17].

Within the limitations of the current study, the data presented may not be the representative of general diabetic population at large. However it clearly demonstrates that many diabetic adults have poor awareness of oral and general complications associated with diabetes, and they receive limited advice from Health care professionals. 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 take the responsibility to develop programs to educate the public to create awareness on regular dental visits.

CONFLICT OF INTEREST None

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