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Original Research

Knowledge, Attitude, and Awareness among Diabetic Patients in Srinagar city about the Association between Diabetes and Periodontal Disease

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ABSTRACT:

Background: Diabetes is one of the fastest growing diseases worldwide. Not only it has an impact on the systemic health but it also affects oral health in general and periodontium in particular. Awareness and knowledge of diabetes and its effects on various systems of the body is necessary for its proper management. Health education and awareness about effect of diabetes on periodontium and effect of periodontal treatment in the management of diabetes can help diabetic patients to cope better with this disease. Thus a study was done to evaluate level of awareness, knowledge and attitude of diabetic patients about the association between diabetes and periodontal disease in Srinagar city. **Materials and Methods:** A cross sectional questionnaire based study was conducted in the Srinagar city, among the diabetic patients to assess level of knowledge, awareness and attitude about the association between diabetes and periodontal disease. 148 patients participated in the study. **Results:** Results showed that majority of patients had good knowledge and awareness about the diabetes management and complications with satisfactory oral health care but the participants were not well versed with inter-relationship between diabetes and periodontal diseases. **Conclusion:** In the Srinagar city, the level of awareness and knowledge about association between diabetes and periodontal disease is low and thus health education in the form of health talks, camps etc is much needed in this region. Also dentists and physician have an important role in emphasizing the importance of life style modification, oral health education and regular visits to the doctor/dentist in the management of this disease.

Key Words: Diabetes, Periodontal health, Periodontal disease

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INTRODUCTION

Diabetes is a chronic metabolic disorder causing hyperglycaemia which leads to long-term damage of different organs including the heart, eyes, kidneys, nerves, and vascular system including periodontium. Periodontitis is the most common oral infection in humans and is the major cause of tooth loss in adults. It is considered as the sixth complication of diabetes.[1] The relationship between periodontal diseases and diabetes has become a recent focus of attention among dentists and in particular periodontists due to substantial evidence supporting two-way relationship with diabetes; diabetes mellitus (DM) is a risk factor for periodontitis and the periodontitis in turn negatively affecting glycaemic control.[2]

There is a recent spike in diabetes as evident by many studies, one of the study estimates the global diabetes prevalence in 2019 to be 9.3% (463 million people), expected to rise to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045.[3] This rise is not a result of genetic changes only but also environmental, as a result of lifestyle habits etc. For successful treatment of DM and periodontitis as well, patients themselves are the most determining factor, life style management constitutes of self-management education, self-management support and lifestyle modification.[4] Thus this survey was conducted to assess awareness, attitude, and practices of diabetic patients in Srinagar, Kashmir population regarding their periodontal health in view of enhancing dental health education for the targeted population.

MATERIALS AND METHOD

A descriptive cross-sectional, hospital- based survey was conducted in the city of Srinagar, UT of Jammu and Kashmir. Before data collection informed verbal consent was obtained from each participant who was willing to participate in the study. The study was carried out by requesting diabetic patients to fill a pretested questionnaire printed in English. Data was collected from the patients visiting Department of Medicine, SMHS Hospital and from the outpatient department of Government Dental College and Hospital, Srinagar.

INCLUSION CRITERION

Patients aged 18years and above with a known history of diabetes and no other systemic disease were included in the study

EXCLUSION CRITERION

Pregnant females, lactating mothers and participants not willing to participate in the study were excluded

SAMPLE SIZE

A sample size of 126 was calculated based on a diabetic prevalence rate of 9.8% from a survey[5] with allowable error of 20% (5% risk) using the statistical formula, n = 4pq/L2.

DESCRIPTION OF QUESTIONNAIRE

The questionnaire was chosen as an appropriate methodology to obtain all the information. A structured questionnaire containing 34 questions divided into six parts based on a thorough review of the literature on diabetes and periodontal disease was designed and some questions which were related to the knowledge about periodontal diseases were constructed by the authors based on the understanding of the disease. Development of questionnaire was based on the pilot study and from the previously published studies.[6,7] Total of 148 forms were collected. Questionnaire included demographic data, questions on the level of information about diabetes and its management, questions on the level of information about systemic complications of diabetes, questions on oral health behaviours, questions on awareness of signs of periodontal or gum disease in diabetics and last part was about questions on the level, source, and need for more information about the association between periodontal disease and diabetes mellitus.

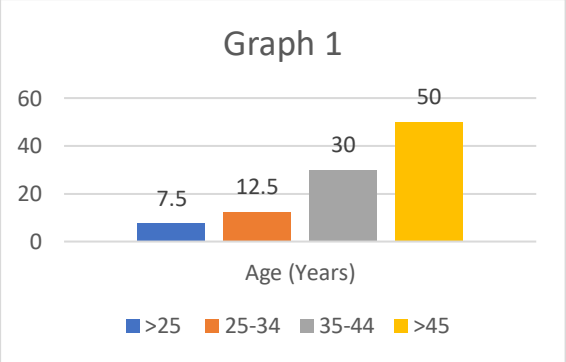
STATISTICAL ANALYSIS

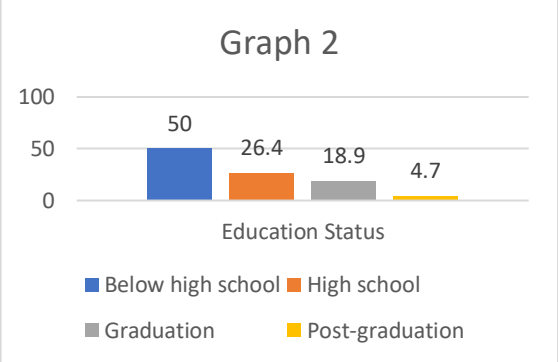
Data was expressed as the frequency and percentage. Statistical analysis was performed with statistical software (SPSS version 16.0, SPSS, Chicago, IL, USA).

RESULTS

1. DEMOGRAPHIC INFORMATION

Result showed an almost equal participation of males and females with 72 females and 76 males answering the questionnaire. Half of the respondents were above 45 years of age and education status upto high school and very low percentage of post graduates. (Graph 1 and Graph 2)





2. QUESTIONS ON THE LEVEL OF INFORMATION ABOUT DIABETES AND ITS MANAGEMENT:

62.8% participants reported a familial history. 83.8% participants reported that their blood sugar is under control with 83.1% participants monitoring blood sugar on a routine basis and 51.4% reported visiting a physician regularly every 6 months. When asked about life style modifications, 80.4% participants were aware of it and its role to maintain blood sugar. 48% reported a regular exercise routine, 77.7% tried to keep their weight within normal limits and 79.7% kept a check on their diet. (Table 1)

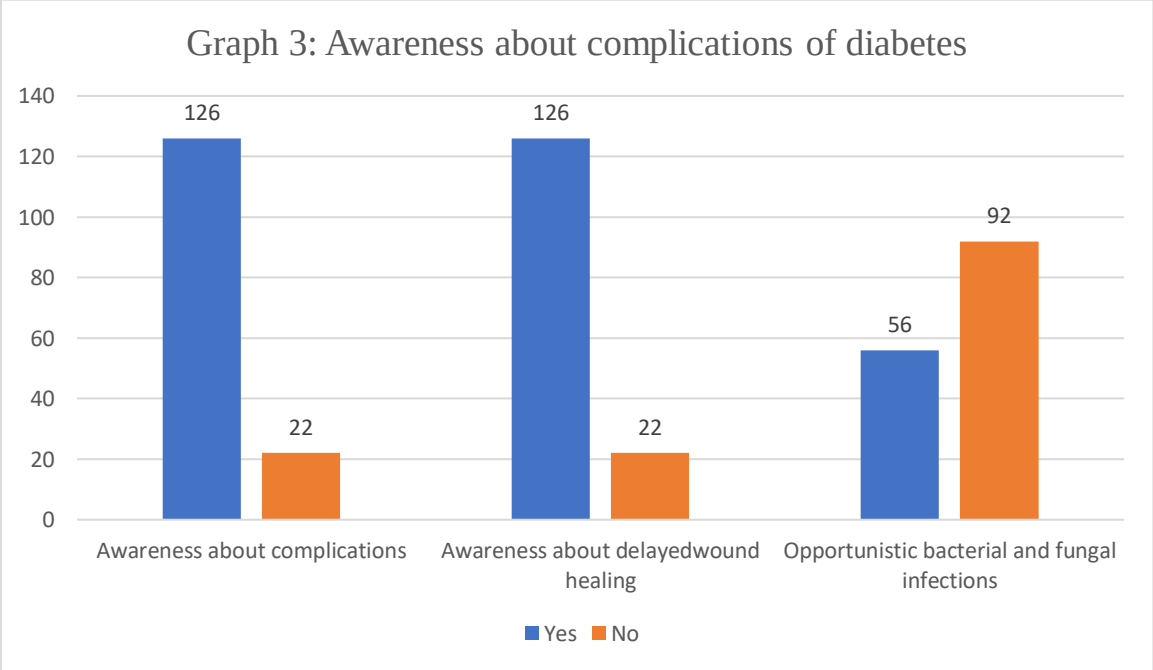
Table 1: Questions on the level of information about diabetes and its management

QUESTIONS	Percentage (%)/ frequency
1. Do you have family history of diabetes?	
Yes	62.8 / 93
No	37.2 / 55
2. Is your diabetes under control?	

Yes No	83.8 / 124 16.2/ 24
3. Do you monitor your sugar level on a regular basis? Yes No	 83.1 / 123 16.9 / 25
4. How often do you visit your physician? Every 1 month Every 6 months During emergency only	 28.4 / 42 51.4 / 76 20.3 / 30
5. Do you know lifestyle modifications and help maintain blood sugar? Yes No	 80.4 / 119 19.6 / 29
6. Do you go for a regular exercise? Yes No	 48 / 71 52 / 77
7. Do you try to maintain your weight within normal limits? Yes No	 77.7 / 115 22.3 / 33
8. Do you do diet control Yes No	 79.7 / 118 19.6 / 29

3. QUESTIONS ON THE LEVEL OF INFORMATION ABOUT SYSTEMIC COMPLICATIONS OF DIABETES:

85.1% participants were aware about complications of diabetes like neuropathy, nephropathy, retinopathy, end organ damage, vascular complications etc and an equal number of participants were aware about delayed wound healing caused by diabetes. 37.8% participants were aware that bacterial and fungal infections are common in uncontrolled diabetics (Graph 3).



4. QUESTIONS ON ORAL HEALTH BEHAVIOURS:

64.2% reported brushing once daily, 79.1% reported using toothpaste with 12.2% reported using other oral aids as well. 6.1% participants reported visiting a dentist regularly and 50% reported the cause of visit being a routine check-up (Table 2)

Table 2: Questions on oral health behaviours

QUESTIONS	Percentage (%)/ frequency
1. How many times do you brush your teeth? One time daily Two times daily More than two times	 64.2 / 95 10.1 / 15 2.0 / 3

Occasionally	23.6 / 35
2. Do you use toothpaste?	
Yes	79.1 / 117
No	21 /31
3. Any other oral aid used?	
Yes	12.2 / 17
No	87.8 / 130
4. How often you visit your dentist?	
Regularly	6.1 / 9
Once in 6 months	24.3 / 36
Only when necessary	62.8 / 93
Never	6.8 / 10
5. Reason for visit:	
Routine checkup	11.5 / 17
Pain/discomfort	58.8 / 87
Cleaning	12.8 / 19
Decay	3.4 / 5
Filling	1.4 / 2
Replacement of missing teeth	8.8 / 13
Others	3.4 / 5

5. QUESTIONS ON AWARENESS OF SIGNS OF PERIODONTAL OR GUM DISEASE IN DIABETICS:

56.8% participants were aware that diabetics are more prone to gum infection, 45.9% participants were told that diabetes affects periodontal health, 30.4% were aware that gum disease affects blood glucose control, 29.1% were aware that treatment of gum diseases helps to improve blood glucose. (Table 3)

Table 3: Questions on awareness of signs of periodontal or gum disease in diabetics

QUESTION	YES [percentage (%)/ frequency]	NO [percentage (%)/ frequency]
Are you aware that diabetics are more prone to gum infection than normal persons?	56.8 / 84	42.6 / 63
Have you ever been told that you should be extra careful of oral health and see a dentist often because you have diabetes?	50.7 / 75	49.3 / 73
Do you really think there is an association between oral health and diabetes?	56.8 / 84	43.2 / 64
Have you ever been told diabetes effects periodontal health?	45.9 / 68	54.1 / 80
Do you believe that your oral health would be better if you did not have diabetes?	59.5 / 88	40.5 / 60
Have you ever been told gum disease effects blood glucose control?	30.4 / 45	69.6 / 103
Are you aware that treatment of gum disease among diabetics may help in improving blood glucose?	29.1 / 43	70.9 / 105
Do you know diabetic smokers have more serious gum disease than non-smokers?	52 / 77	48 / 71
Are you aware that diabetes cause halitosis (bad breath)?	64.2 / 95	35.8 / 53
Are you aware that diabetes cause gingivitis?	41.9 / 62	58.1 / 86
Are you aware that periodontitis (loose teeth) is manifestation of diabetes?	57.4 / 85	42.6 / 63
Are you aware that diabetes can cause xerostomia?	70.3 / 104	29.7 / 44
Is burning mouth syndrome present in diabetes?	31.8 / 47	66.2 / 101

6. QUESTIONS ON THE LEVEL, SOURCE, AND NEED FOR MORE INFORMATION ABOUT THE ASSOCIATION BETWEEN PERIODONTAL DISEASE AND DIABETES MELLITUS:

50.7% participants reported that their source of information is the dentist with 75.7% reporting that their dentist has knowledge about their condition and 43.2% participants report that they would like the dentist to give them more information about their condition and the effect caused to the oral cavity (Table 4).

Table 4: Questions on the level, source, and need for more information about the association between periodontal disease and diabetes mellitus	
QUESTION	**Percentage (%) / frequency**
1. Source of information	
Dentist	50.7 / 75
Physician/diabetics doctor	39.9 / 59
Friends	3.4 / 5
Other sources: media, etc	6.1 / 9
2. Does your dentist know that you have diabetes?	
Yes	75.7 / 112
No	23.6 / 35
3. Have you ever been told by your dentist that you have gum problem/disease?	
Yes	50 / 74
No	50 / 74
4. From whom would you like to get more reliable information?	
By dentist	43.2 / 64
By physician	47.3 / 70
Health talks/camps	5.4 / 8
Other sources: media, etc	4.1 / 6

DISCUSSION

According to the World Health Organization (WHO), in 2019 non-communicable diseases (NCDs) accounted for 74% of deaths globally, out of which diabetes was the ninth leading cause of death globally with 1.6 million deaths[8] with the prevalence of diabetes increasing most rapidly in low- and middle-income countries.[9] The prevalence of diabetes in India has risen from 7.1% in 2009 to 8.9% in 2019.[10,11] Also, the incidence of diabetes is also rising steadily in India, with a fast transition from euglycemia to prediabetes and diabetes.[12] Considering that district Srinagar in the UT of Jammu and Kashmir has witnessed an increase in prevalence of type 2 diabetes by 3.55% and an increase in impaired fasting glucose by 1.55% since 2001. A study conducted in 2000 estimated the prevalence of type 2 diabetes to be 6.1% and prevalence of impaired fasting glucose to be 8.1%[13] while the latest study done in 2019 reports the prevalence to be 9.8% [ADA criteria] and 12.1% [WHO criteria] respectively.[5] The present study findings show that most of the study participants were of age group >45 years. Previous studies have found an association between education status and the level of awareness among the participants, showing educated people have more knowledge and awareness of the oral manifestations caused due to diabetes mellitus.[14] A study done by Tang et al. reported that literacy and awareness scores had negative correlation to diabetic control.[15] Bakhshandeh et al[16] in their study have shown that diabetics with lower education levels were more likely to be diagnosed with periodontal disease. However, in this survey half of the participants (50%) had education below high school. No correlation was found in our survey but majority of the survey participants had low education level.

The level of information about life style modifications in diabetics was inadequate in our survey. Overweight and obesity are important risk factors for type 2 diabetes. The marked increase in the prevalence of these factors is presumably responsible for the recent increase in the prevalence of type 2 diabetes. Lifestyle modification aimed at reducing food intake and increasing physical activity is the principal therapy for patients with high BMR in type 2 diabetes.[17] Less than 50% of the participants were performing regular exercise while about 80% participants restricted calorie intake.

Diabetes is associated with an increase in mortality and morbidity due to persistent increase in hyperglycaemia. Complications of diabetes include hyperosmolar coma, dehydration, poor wound healing and diseases such as myocardial infarction, stroke, limb ischemia, kidney failure, retinopathy leading to blindness, neuropathy, neurocognitive decline and foot infections, which can lead to amputation.[18] Survey participants had good knowledge (85.1%) about complications arising due to diabetes.

Regarding oral health behaviour, 62.8% participants only visited a dentist in case of need and 58.8% participants reported visiting dentist in case of pain. Almost similar results were obtained in previous studies.[19-21] Thus, most participants were not compliant with dental visits, with only 6.1% visiting their dentists regularly. This is consistent with few previous studies.[22,23] Also, the findings that only 10.1% of the participants brushed their teeth twice daily, 64.2% brushed their teeth once daily, and the majority of participants (87.8%) never used any other oral aid to clean between their teeth indicate that oral hygiene measures are inadequate in this population and thus health awareness regarding the same is necessary to improve the oral condition of diabetics in this region. Similar results were obtained in the study done by Bahamam MA[24] and also in some other studies.[16,22]

Regarding the awareness about periodontal and gum disease. Overall awareness and information about effect of persistent hyperglycaemia on gums and periodontium was low in the participants. With only about half of them having knowledge about

association between oral health and diabetes. However even a further lower number; less than one third of the participants had awareness that gum disease affects blood glucose control and treatment of the same could help to improve blood glycaemic scores. Similar findings were seen in earlier studies.[22,24,25] These findings indicate that participants in the present study were less aware regarding the possible inter-connection between periodontal diseases and diabetes and thus there is a need to educate them regarding the same. For about 50% of the participants their source of information was the dentist. The majority of the patients (83.8%) in the present study reported that their dentist knew that they had diabetes. This was in accordance with other studies done.[19,26,27] Only half of the participants were told by the dentist about their gum/ periodontal condition indicating a lack of communication between dentist and patient about the treatment needs. This is in accordance with a previous study conducted in Davengere.[19]

Majority of the participants would like to get more reliable information about their condition, its prevention and treatment by their dentist (43.2%) and their physician (47.3%), similar results were obtained in a previous study conducted in Davengere.[19] However, 5.4% participants would like to get information through health talks and awareness camps and a low percentage (4.1%) would like the same to be from internet, magazines etc. Even if the percentage was low but still the importance of mass media to educate the masses cannot be underestimated.

Thus, from this survey we can conclude that in Srinagar district the overall knowledge and awareness among diabetics was poor and needs to be upgraded for the benefit of the entire community.

SOURCE(S) OF SUPPORT
Nil

CONFLICTING INTEREST
We certify that we have no proprietary, financial, or other personal interest of any kind in any product, service, and/or company that is presented in this article.

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