Assessment of Knowledge And Attitude Among Diabetic Patients About Their Oral Health- A Questionnaire Study

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Abstract

Aim: *The aim of this study was to assess the knowledge and attitude of diabetes mellitus patients about their oral health, and its association with periodontal health.*

Materials And Methods: *This is a cross sectional study with a sample consisting of 110 diabetic patients suffering from Type I or Type II Diabetes Mellitus for at least 6 months, belonging to both the genders. A custom made questionnaire will be prepared to explore the knowledge and awareness about periodontal health among diabetic patients. The questionnaire will consist of 11 questions. The filled responses will be then transferred to the microsoft excel sheet for appropriate statistical analysis.*

Statistical Analysis: *Collected data was analyzed by frequency percentage and chi-square test. The analysis was carried out by SPSS software version 21.*

Results: *The results showed that about 62% of the study population had poor knowledge, only 38% of them had good knowledge and only 29.8% of the study participants among the age group of 35-45 years had adequate knowledge about the effects of diabetes on oral cavity.*

Interpretation and Conclusion: *The knowledge of diabetic patients about their increased risk for oral diseases is low in comparison with their knowledge of increased risk for other conditions. The dental professionals need to increase the awareness of the importance of maintaining a good oral health and to organize programmes which can help in the education as well as encouragement of such patients.*

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I.   Introduction

Periodontitis is a common chronic disease of the tissues supporting the teeth which is caused due to the bacterial deposits that accumulate on the tooth surface and form a biofilm. Gingival inflammation can occur due to these bacterial deposits, which is reversible. Sometimes, biofilm can remain for a longer period of time. In such conditions, the inflammation may expand to all periodontal tissues such as gingiva, periodontal ligament, cementum, alveolar bone and this can further lead to irreversible attachment loss (periodontitis). The pathogenesis of periodontal disease and its severity differ between individuals[1] .The systemic effects of periodontal diseases are of great interest during the past two decades. Periodontitis is an inflammatory response to a bacterial challenge. A portal of entry for periodontal pathogens, bacterial endotoxins, and proinflammatory cytokines occurs in periodontal disease. Thus, this inflammatory disease may induce a systemic inflammation which can further aggravate various systemic diseases such as cardiovascular disease, pulmonary disease, rheumatoid arthritis, and diabetes mellitus[2].According to American Diabetes Association, diabetes mellitus is defined as "a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both." The symptoms of Diabetes Mellitus include polyuria, polydipsia, and weight loss, sometimes polyphagia and blurred vision can occur, accompanied by impairment of growth and increased susceptibility to certain infections. Other complications which occur are retinopathy, nephropathy, neuropathy, macrovascular disease, and altered wound healing. The most common oral complication of diabetes mellitus is periodontal disease. It is also known as the "sixth" complication of diabetes mellitus[3].Diabetes is an important risk factor in the pathogenesis of periodontal disease. Subjects with diabetes are more likely to cause periodontal disease compared with subjects without diabetes. A bidirectional relationship can be seen between levels of periodontal disease and glycaemic levels. Inflamed periodontal tissue can cause inflammatory responses which can further increase the severity of diabetes. Thus the awareness about the systemic and oral manifestations of diabetes and its complications is very important The aim of this study was to assess the knowledge and attitude of diabetes mellitus patients about their oral health, and its association with periodontal health.

II. Materials And Methods

There is no universally accepted or recommended index/ inventory to measure oral health knowledge and awareness. The data was collected based on the knowledge and behavioral aspects which was derived from a series of independent questionnaires consisting of close ended questions. This was a cross sectional study with a sample consisting of 110 diabetic patients suffering from Type I or Type II Diabetes Mellitus for at least 6 months, belonging to both the genders reporting to the Department of General Medicine and Department of Endocrinology, Yenepoya Medical College and Department of Periodontology, Yenepoya Dental College, Mangalore. Participation in the survey was voluntary and anonymity was maintained about the personal record. A custom made questionnaire was prepared to explore the knowledge and awareness about periodontal health among diabetic patients. The questionnaire consisted of 12 questions. Questionnaire design- The questionnaire was prepared by the principal investigator in consultation with other authors. A structured questionnaire was designed based on a thorough review of the literature on diabetes and periodontal disease.

1. The questionnaire consisted of three parts:
2. The first part of the survey assessed sociodemographic characteristics(age, education and occupation).
3. The second part assessed attitude of the participants about diabetes.
4. The third part assessed participants general awareness of diabetes.
5. The questionnaires were distributed to the subjects who came to the Department of General Medicine and Department of Endocrinology, Yenepoya Medical College and Department of Periodontology, Yenepoya Dental College, Mangalore. It took the majority of the participants 5–10 min to complete the questionnaires. The filled responses were then transferred to the Microsoft excel sheet for appropriate statistical analysis.

VI. Statistical Analysis

Collected data was analyzed by frequency percentage and chi-square test. The analysis was carried out by SPSS software version 21.

VII. Results

General Characteristics Majority of the participants of this study were in the age group of 46-55 years, around 42.7% were between 35 and 45 years and 13.6% were >55 years. The study population was heterogeneous. Out of the total study population 15.5% had primary school education, 60.9% had secondary school education and 23.6% had post secondary school education (Table 1).

Variable	Sub groups	Number	Percentage
Age group	35-45	47	42.7
	46-55	48	43.6
	>55	15	13.6
Educational Qualification	Primary	17	15.5
	Secondary	67	60.9
	Pre- university	23	20.9
	Post graduate	3	2.7

Table 1- Demographic details of study participants

7.1 Response to Knowledge Questions

The mean knowledge level was around 2.02 (Table 2). The awareness level of subjects within the age group 46-55 years was more (45.8%) when compared to those with the age >55 years(38.2%) and the least was seen within the age group of 35-45years(31.9%).Subjects with primary school education had least knowledge about whether diabetes can cause gum disease (17.6%). Post graduates were aware about the relationship between diabetes and gum disease (100%). This was statistically significant (Table 3).
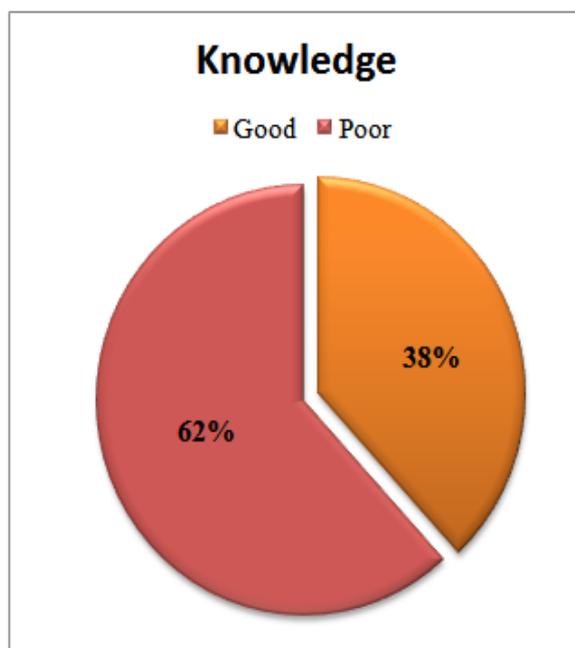
Variable	Sub groups	Number	Percentage	Mean	Standard deviation
Knowledge	Good (>2)	42	38.2	2.02	1.084
	Poor (≤2)	68	61.8		

Table-2: Mean knowledge level of patients enrolled in the study

Variables	Subgroups	Knowledge		p-value	significance
		Good	Poor		
Age group	35-45	15 (31.9)	32 (68.1)	0.346*	NS
	46-55	22 (45.8)	26 (54.2)		

	>55	5 (33.3)	10 (66.7)		
Educational Qualification	Primary	3 (17.6)	14 (82.4)	0.001**	Sig
	Secondary	20 (29.9)	47 (70.1)		
	Pre- university	16 (69.6)	7 (30.4)		
	Post graduate	3 (100)	0		

Table 3- Comparison of demographic details of study participants based on Knowledge

Pie Chart I

7.2 Response to Attitude Questions

The mean attitude level was around 0.44 (Table 4). Among subjects within the age group of 35-45 years, about 48.9% of participants knew that their oral health would have been better if they did not have diabetes while in subjects with age >55 years, 33% of participants were not aware that oral health would have been better if they did not have diabetes. This difference was statistically significant.Post Graduates were aware that their oral health would have been better if they did not have diabetes (100%) while 88.2% participants with primary education were aware about this. Only 43.5% of the participants with post secondary school education were aware that oral health would have been better if they did not have diabetes. This difference was statistically significant (Table 5).
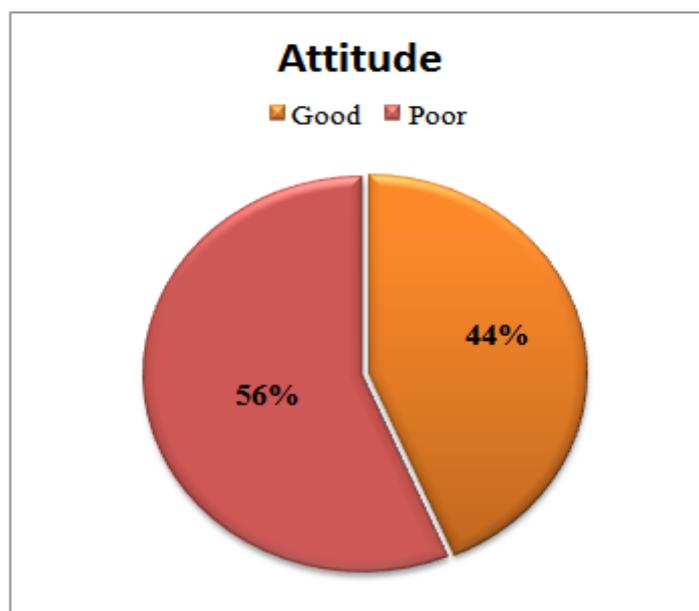
Variable	Sub groups	Number	Percentage	Mean	Standard deviation
Attitude	Good (1)	48	43.6	.44	.498
	Poor (0)	62	56.4		

Table-4: Mean awareness level of patients enrolled in the study

Variables	Subgroups	Attitude		p-value	significance
		Good	Poor		
Age group	35-45	23 (48.9)	24 (51.1)	0.013*	Sig
	46-55	20 (41.7)	28 (58.3)		
	>55	5 (33.3)	10 (66.7)		
Educational	Primary	2(88.2)	15(11.8)	0.001**	Sig

Qualification	Secondary	33(49.3)	34(50.7)		
	Pre- university	10(43.5)	13(56.5)		
	Post graduate	3(100)	0		

Table 5- Comparison of demographic details of study participants based on attitude

PIE CHART –II

Response to General Question

| General questions | **Adequate(>3)** | 41 | 37.3 | 2.96 | 1.306 |
| | **In adequate(<3)** | 69 | 62.7 | | |

Table 6- Distribution of study participants based on general questions

variables	Subgroups	General questions		p-value	significance
		Adequate	Inadequate		
Age group	35-45	14 (29.8)	33 (70.2)	.255*	NS
	46-55	22 (45.8)	26 (54.2)		
	>55	5 (33.3)	10 (66.7)		
Educational Qualification	Primary	3 (17.6)	14 (82.4)	.171**	NS
	Secondary	25 (37.3)	42 (62.7)		
	Pre- university	11 (47.8)	12 (52.2)		
	Post graduate	2 (66.7)	1 (33.3)		

Table 7- Comparison of demographic details of study participants based on general questions

Among study participants within the age group of 46-55 years, 45.8% have noticed the effects of diabetes in oral cavity. Only 29.8% of the study participants among the age group of 35-45 years had adequate knowledge about the effects of diabetes on oral cavity. This difference was not statistically significant. Subjects with primary school education noticed the effects of diabetes in the oral cavity more (82.4%) when compared to other groups (Table 7).

VIII. Discussion

Periodontal diseases are collectively the most common diseases known to mankind. Their classification is complex and takes into account the clinical presentation, age at diagnosis, rate of disease progression, and systemic and local factors that may increase risk. Periodontal diseases include gingivitis (in which the

inflammation is confined to the gingiva, and is reversible with good oral hygiene) and periodontitis (in which the inflammation extends and results in tissue destruction and alveolar bone resorption). Oral health is a true indicator of the general health. Many systemic disorders have an overt and direct effect on the oral cavity and oral tissues. In fact, some systemic diseases present with oral manifestations which prove to be the only diagnostic hint in the initial phase of the disease on seldom occasions. Some diseases on the contrary, have an indirect influence on the oral health of an individual by either predisposing the individual for various oral ailments or by compromising the integrity of the oral tissues. One such disorder, metabolic in nature which has challenged the medical fraternity for centuries is diabetes mellitus (DM). The most common oral complication of diabetes mellitus is periodontal disease, which has also been labelled as the "sixth" complication of diabetes mellitus. This study was undertaken to assess the knowledge and attitude of diabetes mellitus patients about their oral health, and its association with periodontal health.The present study showed inadequate awareness among majority (62%) of the study population. This may be due to the low educational level of the patients. The results of the present study were similar to study conducted by Eldarrat et al [4] who conducted a study to assess the awareness of diabetic patients about their increased risk for systemic and oral diseases. The study concluded that diabetic patients were found to have little awareness of their increased risk for oral diseases. Jayanthi et al [5] conducted a study to evaluate awareness among Bengaluru individuals regarding diabetes in general and association between diabetes and periodontal diseases. The study concluded that knowledge among the study group was not up to the mark and the healthcare professionals need to take up the responsibility of educating the masses regarding the same.Diabetes is an important risk factor in the pathogenesis of periodontal disease. Subjects with diabetes have a greater prevalence and severity of periodontal disease compared with subjects without diabetes. In Diabetes Mellitus, the function of immune cells, including neutrophils, monocytes and macrophages is often altered. Various neutrophil functions like adherence, chemotaxis and phagocytosis are changed, inhibiting an adequate defense against microorganisms in periodontal infections, there by significantly increasing the destruction of the periodontal tissue. In periodontal disease, the host-microbial interactions lead to production of various chemical mediators like pro-inflammatory cytokine, TNF-α which have local and systemic effects. TNF-α inhibits tyrosine phosphorylation of insulin receptor, which impairs the glucose uptake by cells and thus causing increased insulin resistance, leading to poor glycemic control.Mealey et al[6] suggested that the risk of periodontitis is increased by approximately threefold in diabetic individuals compared with non-diabetic individuals. There appears to be a bidirectional relationship between levels of periodontal disease and glycaemic levels. Allen et al[7] conducted a study to assess the knowledge diabetic patients have of their risk for periodontal disease, their attitude towards oral health and their oral health-related quality of life. The study concluded that awareness of the potential associations between diabetes, oral health and general health needs to be increased in diabetic patients. Ismaeil et al[8]conducted a study to assess the knowledge and awareness of diabetic patients about their risk for oral diseases as complications associated with diabetes, and to assess their attitudes and practices toward sustaining good oral health through proper oral hygiene and regular dental check-ups. The study concluded that the level of awareness and dental health knowledge in diabetic patients was deficient. Several other researchers who also demonstrated that diabetics had more knowledge about their increased risk for systemic complications than they had about their oral and dental complications[9,10].Dentists, physicians and other health providers should recommend that a diabetic patient see a dentist regularly. Dental practitioners have an opportunity and responsibility to educate diabetic patients about the oral complications of diabetes and to promote proper oral health behaviours. Regular dental visits provide opportunities for professional care in prevention, early detection and treatment of oral diseases are important for diabetic patients. The physician's knowledge about the association between diabetes and oral health is also important. Jaiswal et al[11] conducted a study to assess the extent of awareness of periodontal disease in diabetic patients, among medical interns. The study concluded that although medical interns have thorough knowledge about diabetes, their knowledge about periodontal disease is finite. Also, they were unaware of the periodontal manifestations in such patients. General practitioners have the responsibility to consult a dentist in case of any oral complication associated with the disease. Blood glucose level of patients should be assessed before any dental procedure. Inflammatory responses produced by inflamed periodontal tissue can increase the severity of diabetes. Thus one should be aware about the systemic and oral manifestations of diabetes and its complications. Public awareness about the association between diabetes mellitus and periodontitis is important. This can be achieved by conducting camps, street plays, by newsletters, television, radio programmes..etc.

IX. Conclusion

The knowledge of diabetic patients about their increased risk for oral diseases is low in comparison with their knowledge of increased risk for other conditions. The dental professionals need to increase the awareness of the importance of maintaining a good oral health and to organize programmes which can help in the education as well as encouragement of such patients. Within the limitations of the present study, diabetic patients were found to have little awareness of their increased risk for oral diseases. 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 responsibility for educating the public about the oral manifestations of diabetes and its complications for oral health. Every diabetic patient and his family should be properly educated in details, about the prevention and treatment of this disease and also to ensure that they are regularly consulting their treating physicians and dentists.

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