

## ASSESSMENT OF AWARENESS OF THE STRONG RELATIONSHIP BETWEEN PERIODONTITIS AND DIABETES MELLITUS

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### ABSTRACT

Diabetes mellitus and periodontitis both are the most prevalent diseases among adults and older individuals worldwide. The correlation between these two diseases has also been well established. However, the awareness among diabetics for their increased risk of periodontitis is still lacking. The aim of present study was to assess the awareness of the strong relation between type *Diabetes mellitus* and periodontitis among patients with diabetes mellitus. A cross-sectional study was carried out by filling out the self-designed questionnaires by the researcher. The participants were diabetic individuals and all were registered as diabetics at Al Karama Specialized Dental Center- Al-Karama teaching hospital-Baghdad /Iraq. The study included (60) patients with type 2 diabetes mellitus. The results showed that diabetic individuals are not aware of having increased risk for periodontitis. Also, the diabetic patients are not being informed by their physicians regarding their higher risk of developing dental problems as compared to non-diabetic individuals. It can be concluded that for better interdisciplinary understanding and comprehensive treatment for patients, it is essential for physician to understand the relationship between periodontal disease and diabetes mellitus to provide appropriate assessment and management of health care needs of these patients

**KEYWORDS:** Diabetes mellitus, oral awareness, periodontitis.

### INTRODUCTION

Diabetes causes severe long-term complications such as retinopathy, neuropathy, nephropathy, cardiovascular and cerebrovascular diseases.<sup>[1]</sup> Despite these complications, periodontitis is considered to be the sixth complication of diabetes mellitus. In uncontrolled diabetes, the metabolic processes which are responsible for producing resistance against infection and trauma are also affected.<sup>[2]</sup>

Diabetic patients have increased level of glucose in the blood and in the gingival fluid as well. So, the availability of this excess glucose which comes in contact with structural and other proteins leading to the formation of AGE (advanced glycation end) products. These AGE's then bind with the cellular receptors called as receptors for AGE (RAGE). The RAGE is present on endothelial cells and monocytes. And this binding of AGE with RAGE leads to a sequence of reactions causing increased inflammatory response which in turn

leads to the rapid destruction of the periodontium and diminished repair of damaged tissues.<sup>[3]</sup> "It has been reported by Russel that nearly 40% of a group of 37 diabetics exhibited gingival angiopathy in the form of PAS- positive, diastase-resistant thickening of vessel walls, hyalinization of vessel walls and sometimes luminal obliteration. Similar changes were also found in the periodontal ligament vessels of patients with diabetes mellitus".<sup>[4]</sup>

Leo proposed that periodontitis is the sixth complication of diabetes mellitus.<sup>[5]</sup> After controlling for age and sex, the rate of periodontal disease in subjects with diabetes was 2.9 times, nearly threefold what it was in individuals without diabetes. In this way, this study proved that diabetes confers an added risk of periodontitis. Moreover, these studies provide the longitudinal data that confirm previous cross- sectional observational data of the association between diabetes and periodontal disease in this population. It has been concluded that

diabetics had 15 times more probability to be totally edentulous compared to non-diabetic individuals. Also, the edentulousness is increasing more frequently with duration of diabetes ranging from 7% edentulous for diabetes of 5-year duration to 14% for 10-year duration to 75% for diabetes of 20-year duration.<sup>[6]</sup>

## PATIENTS AND METHODS

This descriptive cross-sectional study included (60) patients who were diagnosed with type 2 DM. All the patients were cooperative and very well responded to the survey. Out of these (60) patients, 18(30%) were males and 42(70%) were females. The majority of patients were from Baghdad city. All the patients surveyed under this study were above 35 years of age.

### Statistical analysis

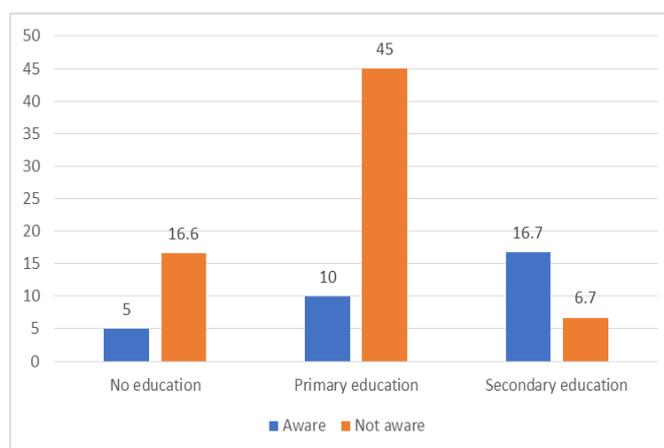
SPSS 20.0 software was used for the statistical analysis of the collected data. The hypothesis was tested by using the  $P < 0.05$  as statistical significant value. Chi-square test was used.

## RESULTS

It was found that out of the total studied (60) patients, 18 (30%) were males, whereas, 42 (70%) were females as shown in table (1). The primary level of education constituted 33(55.0%), whereas the secondary level education was 14(23.4%), and 13(21.6%) of them were illiterate (table 2). Average age of patients under study was 54.3 years with 5(8.3%) were above 35 years of age, 4(6.7%) were above 40 years, 34(56.7%) were above 50 years and 17(28.3%) of them were above 60 years as shown in table (3).

**Table 1: Distribution of study population according to gender.**

Demographic characteristics	Cases	
	Frequency	Percentage
Illiterate	13	21.6%
Primary	33	55%
Secondary	14	23.4%
Total	60	100.0



**Figure 1: Awareness level among study population as per educational status (in percentage).**

**Table 2: Distribution of sample according to educational level.**

Gender	Cases	
	Patients	Percentage
Male	18	30%
Female	42	70%
Total	60	100.0

**Table 3: Age-Wise Distribution of Study Population in Percentages.**

Age	Cases	
	Frequency	Percentage
$\leq 40$ years	5	8.3%
> 40-50 year	4	6.7%
> 50-60 years	34	56.7%
> 60 years	17	28.3%
Total	60	100.0

Almost all the patients were aware of that they have diabetes and all patients had checked their blood glucose level within last six months. They were also aware of the readings of their last blood sugar test.

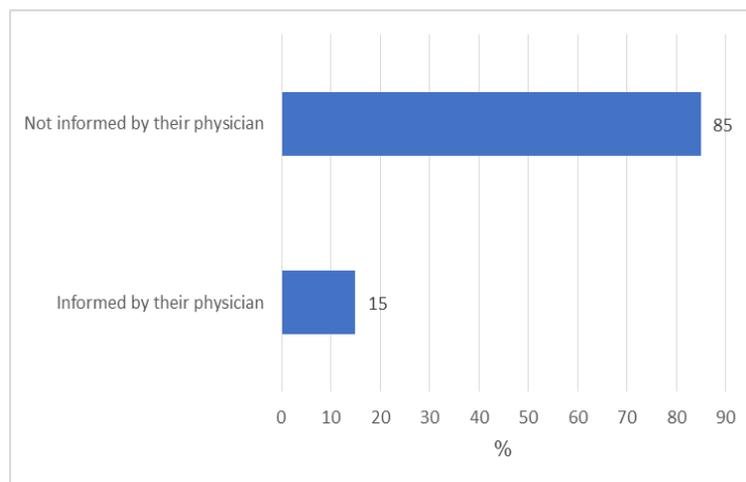
Results showed that 40(66.7%) of sampled population got information related to diabetes from health care providers and 20(33.3%) of them reported that they received information about diabetes from their friends and family members.

19(31.7%) of total participants reported that they were aware of the increased risk of tooth problems due to diabetes, however, 41(68.3%) were found to be unaware of the link between diabetes and periodontitis.

Among all the participants, the only 10(16.7%) who knew the link between diabetes and periodontitis belonged to the 14(23.4%) of those who received the secondary education while 6(10%) of the primary education were aware and 3(5%) of the illiterate were aware (Chi square=13.45,  $P=0.001$ ). (Figure 1).

Only 9(15.0%) of total participants were informed by their physicians that they are more susceptible to have dental problems and 51(85.0%)% of them were never

advised by their health care providers to take good care of oral health as diabetics are at increased risk of developing periodontitis. (Figure 2).



**Figure 2: Percentage of diabetic patients who received information regarding their diabetes from physicians and percentage of patients who were aware of its association with periodontitis.**

## DISCUSSION

The data obtained through this study showed that among all the diabetic participants, 70% were females suffering from this disease whereas only 30% of males were reported to be suffering from diabetes. This reflects that diabetes is more common among females as compared to males. All the patients were above 35 years of age and the average age of studied population was found to be aged 54.3 years with 56.7% patients were above 50 and less than 60 years of age and 28.3% were above 60 years of age.

The remaining 15.0% of participants were between 35 and 50 years of age. As per educational status, majority of participants had received only primary education (55.0%), only 23.4% had secondary education, and 21.6% of total patients were reported as illiterate that is with no education.

All the patients were diagnosed with Type 2 DM. Majority, that is 60% of the patients were on oral hypoglycaemic drugs whereas 11.7% of patients received diabetic treatment as insulin injection. And, the patients who received the treatment for diabetes in both forms (i.e oral as well as insulin injection) comprised of 28.3% of total studied sample. All the patients have been suffered from diabetes for more than 5 years with the mean duration of onset was 6 years.

The patients who exercised on a regular basis comprised of only 8.3%, however, 91.7% had never exercised or exercised occasionally. 80% of participants had told that they visited their physicians regularly and percentage of patients who had not visited the physician at regular intervals was only 20%, shows that most of the patients were keeping up the appointments with their physicians. On the other hand, only 8.3% of diabetic patients had

visited the dentist on a regular basis and 91.7% of them had either visited the dentist only occasionally or had never visited their dentists. This shows that these patients were not as compliant with their dental care as they were shown to be more compliant with their treatment for diabetes. As per the oral habits, only 16.7% of patients had brushed their teeth twice in a day and 83.3% of them reported that they brushed only once daily.

A community trial in Finland also concluded that self-reported twice-daily tooth brushing is less frequent in diabetic patients than in non-diabetic individuals.<sup>[7]</sup> Flossing habit was not common among these patients, as, only 4% had used floss to clean the teeth and 96% of patients had never flossed to clean their teeth. So, it was observed that the oral hygiene practice was not the main priority among the studied sample. Regarding the awareness of link between diabetes and periodontitis, percentage of patients who reported that they were aware of this association was only 32% and 68% of them did not know about the association of these two diseases. This study was found to be consistent with one another study that was “conducted in the USA involving 390 patients with diabetes found that only 18.2% recognized that their oral health might be affected by diabetes”.<sup>[8]</sup>

“Also, In the Arab countries, a study conducted on a random sample of 405 diabetic patients in Jordan showed that approximately 48% were aware that diabetic patients are more susceptible to periodontal diseases and oral health complications”.<sup>[9]</sup> It had been observed awareness level was also related to their educational attainment. As, patients who had received the secondary education (23.4%) were found to be more aware (16.7%) than those who were not educated or who had received only primary level education. On the contrary, almost all the patients were aware of their diabetes and they also knew their blood glucose levels in the last test.<sup>[10]</sup> Regarding

physician's advice to take care of oral health to these diabetic patients, 15.0% reported that they had been advised regarding the complications of diabetes including its effects on teeth, whereas, the remaining 85.0% were never informed by their physicians about their increased risk of developing periodontitis. Although, the majority of patients 66.7% got the information regarding their diabetes from health care providers and only 33.3% had received the information regarding diabetes from friends or family members, but still the majority of participants were unaware of this association.

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