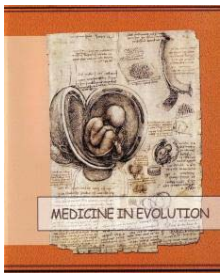
The relationship between diabetus melitus and periodontal health status



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Abstract

The relationship between diabetes and oral cavity disorders is well known. Until the last decades it was believed that it is unidirectional, respectively diabetes mellitus triggers and favors the occurrence and evolution of periodontal disease. At present, more and more studies show that the relationship is bidirectional, respectively and periodontal disease is a trigger factor and maintains diabetes.More evidence has been made that this connection is present even in the prediabetic patient. this topic, we concluded that no matter what angle the research would have achieved, the unanimous conclusion is that between the two conditions there is a close interdependence, they influence and intercondition each other.

Keywords: diabetus melitus, prediabet, periodontal health, relationship

INTRODUCTION

In the oral cavity there is a balance between the state of the buccal mucosa, respectively of the marginal periodontium and the factors that tend to destabilize this balance. The etiopathogenesis of the periodontal disease has long been discussed in the literature. At the present time, besides the local factors, the general factors are taken into account. Although there have been many studies investigating the link between diabetes and oral health, however, very little is known about the knowledge of patients with periodontal disease in relation to the interdependence and implications of diabetes. Both non-diabetic people and people at risk and diabetics may have limited knowledge about the relationship between diabetes and periodontal disease, and a visit to a family doctor or diabetologist will probably not improve their knowledge in this area. Most family physicians or diabetologists may not provide information on the link between diabetes and periodontal disease. The dentist can provide this information.

For a better understanding of the relationship between diabetes and oral health, awareness of oral health and identification of attitude towards the involvement of the dentist in the screening of diabetes in his patients, the current study wanted to examine two groups, diabetics and nondiabetics. Their knowledge of diabetes and the source of that knowledge. For 2014, it has been estimated that, globally, 422 million adults suffered from diabetes. By comparison, in the year 1980, there were 108 million people with this condition [1]. The recrudescence of the disease has almost doubled since 1980 globally, rising from 4.7% to 8.5% of the adult population. These values reflect an increased incidence of the disease in association with risk factors such as overweight and obesity. Diabetes caused 1.5 million deaths in 2012 and the higher than optimal blood glucose level caused another 2.2 million deaths. Of the total deaths, 43% occurred before reaching the age of 70 [2].

In Romania, the incidence of diabetes is 11.6% among the population aged between 20 and 79 years [3] and 3% in children between 0 and 14 years old [3]. In 2015, the Ministry of Health indicated the number of diabetic patients registered at 999, 192 and the number of persons diagnosed during the same year 2015 was 73,740 (202 new cases per day) [5].According to the data published by the National House of Health Insurance, between 2006 and 2016, the number of people for whom diabetes treatments were settled has doubled and the costs have increased 6 times [1].

Because periodontal disease is associated with diabetes, the utility of screening in the dental office and the reference to primary care aim to introduce the diagnosis for prediabetics and diabetics. Monitoring studies in dental practice were performed on this category of subjects. Studies have estimated that 30% of patients seen in dental practice, older than or equal to 30 years, had dysglycemia [6,7,8].

The study aimed to investigate the relationship that exists between oral cavity health, in particular the degree of periodontal disease and diabetes or even prediabetes. Starting from empirical observations initially, this relationship has been studied by several authors and has shown that this connection exists and the results have shown significant correlations.

ORAL HEALTH

Oral health is a generic term and refers to several factors. In general, when we talk about this aspect, most people understand only problems related to dental caries. We need to clarify from the beginning that oral health also refers to: the pathology of the oral mucosa. , periodontal pathology, TMJ pathology and musculoskeletal pathology. Oral health is the mirror of many internal diseases, often certain general diseases are diagnosed in the first instance by the dentist who observes the signs of the disease in the oral cavity that can signal a diagnosis presumptive. Impaired oral health cannot be seen only as a result of poor oral

hygiene as many people consider. It is the result of many local and general favoring factors that both the physician and the patient must be aware of. Among the local favoring factors we can list: hygiene Defective mouth, smoking, occlusal dysfunctions, vicious habits and among the most significant general factors would be: endocrine disorders, metabolic disorders, drug administration.

Dental plaque (considered a factor determining the onset of periodontal disease) is now considered a localized, chronic oral infection, which activates the host's immune-inflammatory responses both locally and systemically and is also a source of bacteremia. It is known that periodontal disease exerts an important influence on the pathogenesis of numerous systemic diseases, including diabetes mellitus [5].

STUDIES

In the mid-1990s, enough scientific evidence emerged to confirm an association between Diabetus Melitus and periodontitis, which then began to be considered the sixth complication of Diabetus Melitus. Current scientific evidence indicates a two-way relationship between Diabetus Melitus and periodontal disease, whereby Diabetus Melitus is associated with an increased incidence and progression of periodontitis, while periodontal infection is associated with worsening glycemic control in diabetic patients [9]. . This two-way relationship indicates a need to promote oral health in patients with Diabetes Melitus and to implement a common management protocol between endocrinologist and dentist that aims to create adequate conditions for early diagnosis and effective treatment of both diseases. Studies show close links between diabetes sugar and oral mucosal health. Harsas & Colab. [10]. In a study of 197 patients showed significant differences between diabetic patients (97 patients) and nondiabetic patients diagnosed with periodontal disease (97 patients) regarding the severity of periodontal disease. From their studies it turns out that there are significant differences ($p = 0.00$) between the 2 groups of patients tested, so that patients with diabetes have higher values when measuring gingival sacs, loss of gingival attachment and gingival recession. The explanation would be according to the authors the increase in blood sugar that causes microvascular complications it has the increase of the final glycation end product (AGE) in plasma and tissue.

The protein glycation reaction would be responsible for most complications of the diabetic patient (nephropathy, retinopathy, neuropathy). Periodontal infection affects the secretion and synthesis of cytokines, where this condition may increase the response of AGE-mediated cytokines. The formation of AGEs in proteins also leads to the establishment of a cross-linking of collagen with the basement membrane, which leads to a decrease in the interactions of collagen and other components of the matrix, followed by the incidence of damage to the structure and function of the basement membrane. The state of hyperglycemia in patients with T2DM who produce AGE will bind to the AGE receptor (RAGE), leading to additional complications such as the development of vascular damage, increased vascular permeability, increased expression of adhesion molecules and increased migration and activation of monocytes. As a result of this state of stress, which causes disorders of the blood vessels in the periodontal tissue [11].

Another study [12] on 100 diabetic patients found that 97% of diabetic patients had loss of gingival attachment compared with 34% in the non-diabetic control group. Also, severe form of periodontitis was present in 54 % of patients compared to 7% of the non-diabetic control group. There were also significant differences ($p = 0.001$) regarding the correlation of periodontitis severity with glycated hemoglobin and postprandial glycemia.

Maboudi et all. [13,14] starts from the hypothesis that the prediabetic condition can be a triggering or aggravating factor of the periodontal disease. Loe, plaque index and periodontal pocket depth. The sample comprised 20 (19%) men and 88 (81%) individuals with a mean age of 49 years and a mean BMI of 27.5. The average FBS, GTT and HbA1C were 107

MG / DL, 137MG / DL, respectively 5.9%. The clinical evaluation showed 33% of the patients involved with periodontitis. The mean CAL, BOP, PI, PD, GI was 3.7, 0.62, 1.9, 2.1, 1.5, respectively ($p < 0.05$). A significant difference in the periodontal index was found in patients with prediabetes. Moreover, a significant correlation was revealed between the prediabetic condition and the degree of damage to the periodontium. In support of this hypothesis come the studies undertaken by [14], on a batch of 171 prediabetic patients 30-65 years. The association of glucose metabolism and chronic periodontitis was investigated by analyzing multivariable logistic regression and the results revealed significant correlations between the impairment of glucose metabolism level and the number of periodontal disorders, mostly mild and severe [16,15].

Molina et all. 2016 [17] considers and demonstrates the bidirectional relationship between periodontal disease and diabetes. Diabetus Melitus was shown to be a risk factor for the occurrence of periodontal disease and subsequently an inverse relationship was proposed that periodontitis could be a risk factor for glycemic decompensation, as well as to be associated with an increased risk of Diabetus Melitus. The impact of periodontitis on changes in hyperglycaemia was assessed in a 5-year prospective study in 2973 non-diabetic subjects. Subjects with more advanced periodontitis at the start of the study showed absolute increases in blood glucose approximately five-fold higher after 5-year follow-up compared with those who did not have periodontitis at the start of the study (HbA1c change 0.106 ± 0.03% vs. 0.023 ± 0.02%). This was the first study to report that periodontitis predicts increases in HbA1c among people without diabetes[18]. The authors argued that periodontal pathogens can stimulate the production of inflammatory cytokines, such as tumor necrosis factor alpha (TNFα), inducing a state of insulin resistance and systemic inflammation, which has also emerged as a new predictor of incident diabetes. More recently, the same author assessed the relationship between periodontal microbiota and the risk of early Diabetus Melitus in a section study that included 300 adults without DM aged between 20 and 55 years. Although the prevalence ratio for pre- Diabetus Melitus among participants with moderate / severe periodontitis vs. no / mild periodontitis was 1.47 (95% CI 0.78 - 2.74), without statistical significance ($p = 0.23$), higher colonization levels of the specific periodontal microbiota were associated with higher prevalence before Diabetus Melitus in adults without Diabetus Melitus .Current scientific evidence suggests that there is an increased risk of developing Diabetus Melitus in people with severe periodontitis, compared to subjects with good periodontal health or only mild periodontitis. Moreover, studies show that the incidences of macroalbuminuria and end-stage renal disease are increased twice or three times, respectively, in diabetics who also have severe periodontitis. Furthermore, people with Diabetus Melitus and severe periodontitis have three times the risk of cardio-renal mortality compared with those without severe periodontitis[19,20].

Also, Kiran et all [21,22] demonstrated that there is a link between the treatment of periodontal disease and the improvement and periodontal disease. Faria-Almeida et al. [23-26] also demonstrated that periodontal disease treatment significantly improves metabolic control of DM. These authors performed a 6-month controlled clinical study of 20 patients divided into two groups (type 2 diabetes and non-diabetics) with moderate generalized chronic periodontitis. Conventional periodontal scaling and root planning were performed, and the response to this work was compared between groups at 3 and 6 months. An improvement of all clinical variables was observed, without statistically significant differences between them groups, except the depth of the poll. The improvement observed in the blood. HbA1c levels confirmed a positive metabolic response to periodontal treatment, with a lower value for this variable at 3 and 6 months after periodontal treatment.

CONCLUSIONS

Analyzing the ones presented above we can draw the following conclusions:

1. There is a correlation between periodontal disease and diabetes
2. The more diabetes is out of control, the more severe the periodontal disease is.
3. There is a two-way relationship with mutual influence diabetes mellitus-periodontal disease.
4. The prediabetic state is a predictive factor for the occurrence of periodontal disease.

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