

RISK FACTORS FOR PERIODONTAL DISEASE IN DIABETIC PATIENTS

Crînguta Paraschiv, Irina Esanu, Cristina Maria Gavrilescu, Rodica Ghiuru,
Dragos Munteanu, Paloma Manea

The Internal Medical Clinic of the Clinical Hospital CF Iasi, University of Medicine and Pharmacy "Gr.T.Popa" Iasi, Romania

*Corresponding author: Dr. Irina Esanu, DMD, PhD
Gr.T. Popa" U.M.Ph. - Iași, Romania, Faculty of Dental Medicine,
The Internal Medical Clinic of the Clinical Hospital CF Iasi;
e-mail: esanu1925@gmail.com

ABSTRACT

Introduction: Periodontal disease is one of the most widespread chronic illnesses with a huge negative impact on the quality of life. Its relationship with other age-related systemic diseases including diabetes has been increasingly discussed, those conditions being associated with increased inflammation markers and sharing common risk factors such as age, smoking, obesity, stress, physical inactivity, environmental factors, metabolic syndrome, systemic medication and nutritional factors. **Objective:** The aim of the study was to assess whether diabetes can be considered as an independent risk factor for periodontal disease. **Methods:** We conducted a prospective study on 117 patients divided in two groups, diabetics and non-diabetics. The diagnosis of various forms of periodontal disease was based on anamnesis, clinical and dental evaluation and laboratory signs. **Results:** The results of the present study demonstrated that periodontal disease is more frequent and pronounced in diabetic patients than in controls (95.83% vs. 37.77%) especially in type 2 diabetes, over 45 years age group, males from rural environment. However, we noted that the presence of smoking, obesity and poor oral hygiene have increased the prevalence of periodontal disease predominantly in non-diabetic participants which supports the role of diabetes as an independent risk factor. **Conclusion:** The diabetic patients must be informed on the risk of periodontal disease and the clinician should encourage them to improve their oral health and to schedule regular visits to the dentist as an important component of their overall diabetes management.

Keywords: diabetes mellitus, periodontal disease, risk factors

INTRODUCTION

Periodontal disease is one of the most widespread chronic illnesses with a huge negative impact on the quality of life. Its prevalence and severity increase with age, chronic periodontal inflammation causing gingival bleeding, periodontal pockets and alveolar bone loss [1]. The relationship between the periodontal disease and other age-related systemic diseases has been increasingly discussed, those

conditions being associated with increased inflammation markers and epigenetic modifications in the regulation of gene expression leading to molecular modifications [2]. Also, many of these inflammatory diseases are sharing common risk factors such as age, smoking, obesity, stress, physical inactivity, environmental factors, metabolic syndrome, systemic medication and nutritional factors [3].

Several studies indicates a direct

relationship between periodontal disease and diabetes mellitus [4]. The common physiological mechanism is inflammation, periodontitis occurring in an exacerbated host response with hyperproduction of mediators [5]. In addition, hyperglycemia causes alteration of oral microbial flora, vascular alterations and collagen metabolism changes which may promote the onset or the worsening of periodontal disease [6].

OBJECTIVE

The aim of our study was to analyze the prevalence of periodontal disease in different categories of diabetic patients considering also other risk factors such as smoking, obesity, socioeconomic status, oral hygiene.

MATERIAL AND METHODS

To achieve our purpose we conducted a prospective study in 117 patients admitted to the CF Hospital Iasi, Clinic of Internal Medicine and Geriatrics-Gerontology.

72 patients formed the study group being diagnosed with diabetes mellitus based on the repeatedly elevated blood glucose levels > 126 mg / dl. The control group consisted of 45 patients hospitalized with other medical conditions than diabetes such as angina, hypertension, kidney stones, chronic bronchitis or rheumatic conditions. All patients were medical and dental evaluated and they were asked to fill out questionnaires on demographic data, oral symptoms and risk factors associated with periodontal disease. All the patients were

consulted in the dental cabinet of CF Policlinic using the dental consultation kit (dental mirror, dental probe and dental clamp). The diagnosis of various forms of periodontal disease was based on clinical and laboratory signs acquired from the subjects: changes in color and consistency of the gums, gingival bleeding, spontaneous or provoked pain, gingival retraction, periodontal pockets of various depths, bone lysis observed on X-ray. Exclusion criteria included severe diabetic complications, renal insufficiency, other systemic diseases considered as risk factors for periodontal disease, antibiotic treatments over the past 6 months, antihypertensive calcium antagonists, antiepileptic drugs, steroids or immunosuppressive drugs and periodontal treatments over the past 6 months. The two groups were comparable regarding age, sex distribution, level of oral hygiene (assessed by questionnaires), the percentage of smokers and obese patients. Recorded data were analyzed statistically, a value of p statistically < 0.05 being considered statistically significant.

RESULTS AND DISCUSSIONS

The demographic characteristics of the patients and the presence of risk factors for the periodontal disease are shown in table I. The present epidemiological study includes 117 patients, 83 males and 34 females with a mean age of 60 years. Age, gender and environment distribution were similar for the study and control group.

Table I. Demographic characteristics of the patients under study

	Diabetic patients	Non-diabetic patients	p
Total 117	72	45	
Age (mean ± SD)	60.23 ±5.87	60.15 ±6.22	NS

Gender	Male	53 (73.61%)	30 (66.67%)	NS
	femal e	19 (26.39%)	15 (33.33%)	NS
Environment	Rural	43 (59.72%)	24 (53.34%)	NS
	Urban	24 (40.27%)	21 (46.67%)	NS
Smokers		38 (52.78%)	24 (53.34%)	NS
Obesity		35 (48.61%)	18 (40%)	NS
Poor hygiene		42 (58.33%)	24 (53.34%)	NS
Periodontal Disease		69 (95.83%)	17 (37.77%)	P<0.03

The prevalence of periodontal disease in the all patients was found to be 73.50%. In the study group almost all patients (69 from a total a 72) had different types of periodontal disease (95.83% respectively), while in the control group only 17 out of 45 non-diabetic patients (37.77%) suffered

from periodontal disease. Analyzing the prevalence of periodontal disease in age groups, we found that the periodontal disease prevails after the age of 65, reaching 100% in elderly diabetics compared with 43.75% in elderly control patients. (Fig.1).

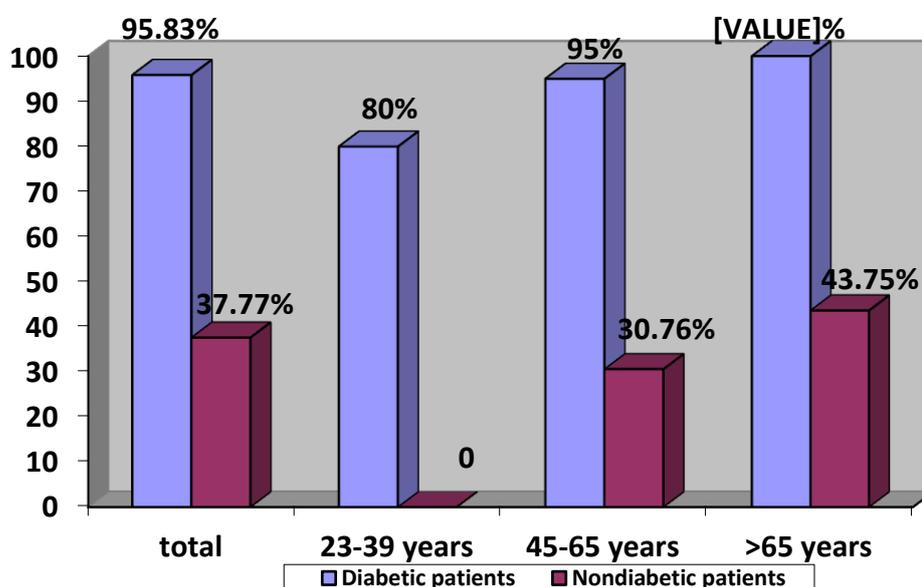


Figure 1. Prevalence of periodontal disease in age groups patients

According to gender, the periodontal disease was more common in both groups in male patients, but it was significantly higher in diabetic men reaching 100% compared to

men in the control group where the prevalence of the disease was 60 %.

Analyzing the prevalence of periodontal disease in diabetic patients based

on the type of diabetes, we found that it reached 77.77% among type 1 diabetics, less than in type 2 diabetes. Patients with type 2 diabetes were diagnosed with periodontal disease in a significant percentage of 97.43%. This difference is probably due to the young age of patients with type 1

diabetes, while patients with type 2 diabetes belonged in the age groups 40-65 years and especially over 65 years. Additionally, at more advanced ages we can expect a longer evolution of diabetes and the presence of more complications with possible implications for periodontal disease. (Fig2.)

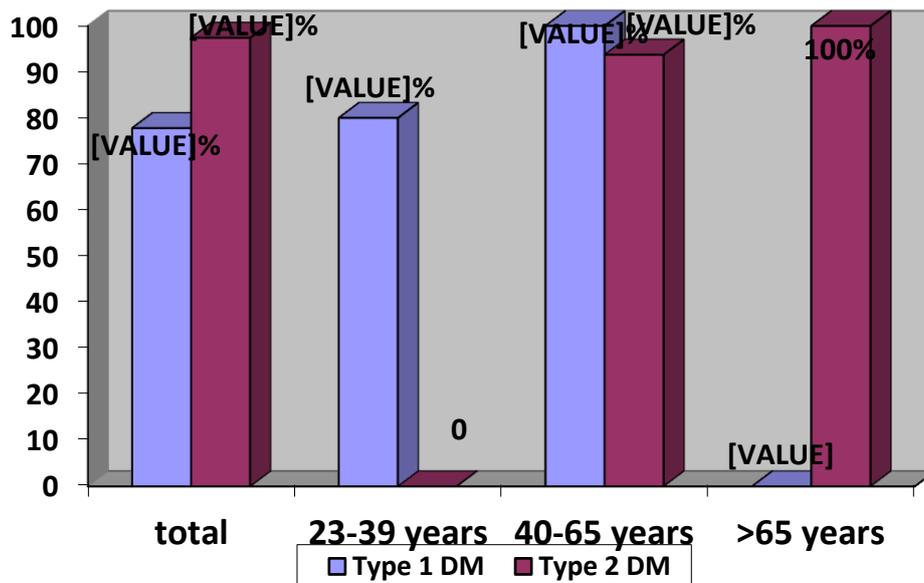


Figure 2. Prevalence of periodontal disease in age groups patients depending on the type of diabetes

In order to assess whether diabetes can be considered as an independent risk factor for periodontal disease we evaluated the association of other risk factors such as home environment, smoking, obesity and oral hygiene.

Analyzing the prevalence of periodontal disease according to the home environment, we noticed that the periodontal disease was prevalent in the rural patients in both studied lots, but while the control group prevailed 58.33%, the diabetic rural patents were all diagnosed (100 with periodontal disease).

The prevalence of periodontal disease in smokers was 79.03% compared to 67.27% in non-smokers, demonstrating the importance of smoking as a risk factor. However, we noted that in non-diabetic patients the presence of smoking has significantly increased the prevalence of periodontal disease from 23.80% to 50%. In the study group the prevalence of periodontal disease was extremely high in both smokers and non-smokers (97.36% vs. 94.11%), advocating the role of diabetes as an independent risk factor. (fig3)

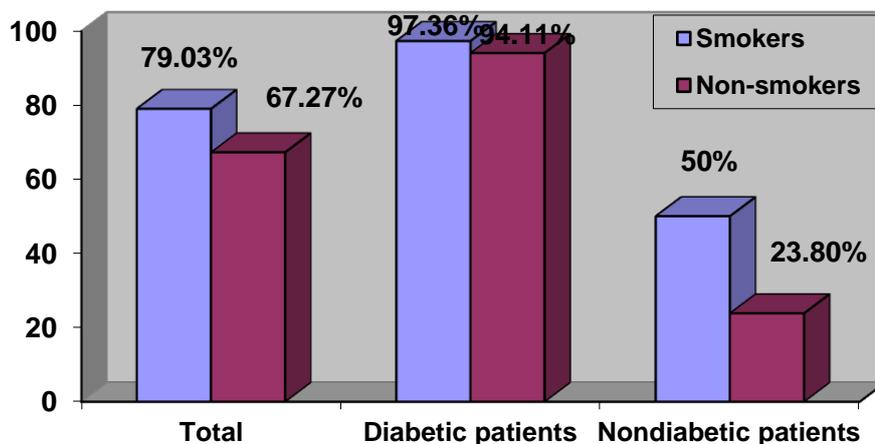


Figure 3. The prevalence of periodontal disease in smokers / non-smokers.

The prevalence of periodontal disease in obese patients was 94.33% compared to 56.25% in normal weight patients demonstrating the importance of obesity as a risk factor. In non-diabetic patients the presence of obesity has increased the percentage from 11.11% to 77.77%. In diabetic patients the prevalence of periodontal disease was higher than in the controls in both subgroups with obesity

(97.14% vs. 77.77%) and especially in the normal weight patients (94.59 % vs. 11.11%). The difference between the prevalence of periodontal disease in weight subgroups in diabetic patients was significant but less important compared to the differences between these subgroups in non-diabetic patients, which supports the role of diabetes as an independent risk factor. (fig4)

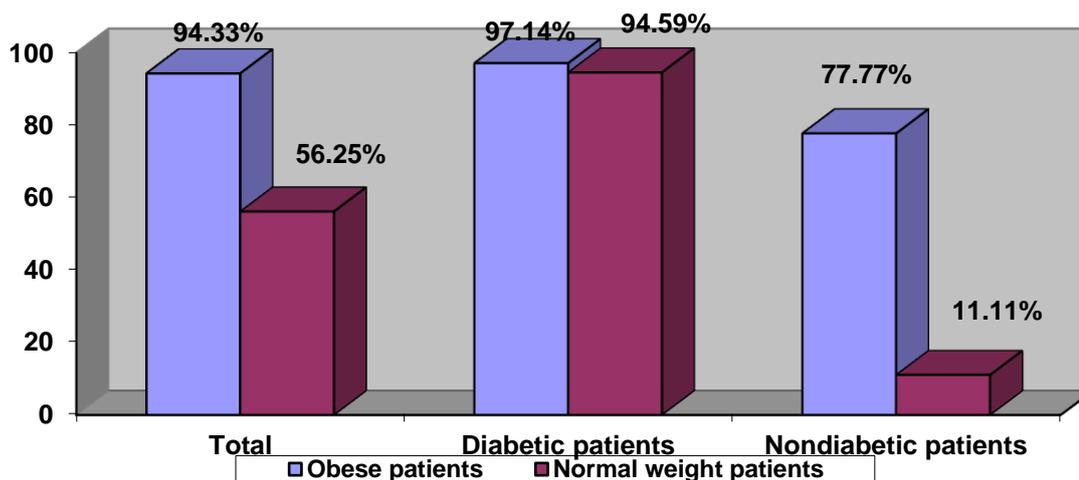


Figure 4. The prevalence of periodontal disease in obese/ non-obese patients.

Periodontal disease was present in all diabetic patients regardless of oral hygiene quality while in non-diabetic patients only

those with poor oral hygiene were affected. Diabetic patients with poor hygiene had a prevalence of periodontal disease of 100 %

while patients with other conditions than diabetes were affected in 87.5%, much more

than those with a good oral hygiene (14.28%). (Fig5.)

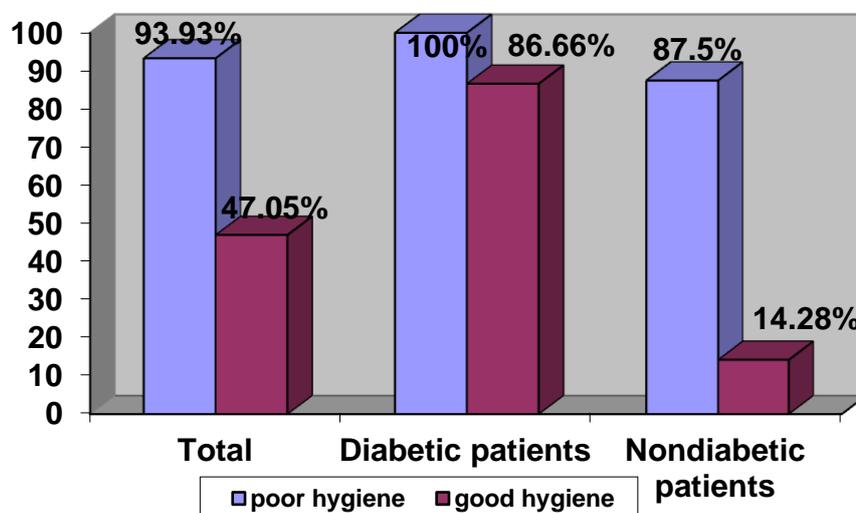


Figure 5. The prevalence of periodontal disease according to hygiene oral status

CONCLUSIONS

The results of the present study demonstrated that periodontal disease is more frequent and pronounced in diabetic patients than in controls especially in type 2 diabetes, over 45 years age group, males from rural environment. However, we noted that the presence of smoking, obesity and poor oral hygiene have increased the prevalence of periodontal disease

predominantly in non-diabetic participants which supports the role of diabetes as an independent risk factor. The diabetic patients must be informed on the risk of periodontal disease and the clinician should encourage them to improve their oral health and to schedule regular visits to the dentist as an important component of their overall diabetes management.

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