



ORIGINAL ARTICLE

Chronic Immunoinflammatory Periodontal Disease in Diabetic Patients

Enfermedad periodontal inmunoinflamatoria crónica en pacientes diabéticos

Danisbel Pérez-Ayala ¹✉ , Dunia Milagros Labrador-Falero ² , Milenis Martínez-Pita³ , Ivette Cáceres-González ¹ 

¹University of Medical Sciences Pinar del Río. Teaching Stomatology Clinic Antonio Briones Montoto. Pinar del Río, Cuba.

²University of Medical Sciences. Pinar del Río, Cuba.

³University of Medical Sciences. Pinar del Río "5 de septiembre" community Polyclinic. Consolación del Sur, Pinar del Río, Cuba.

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ABSTRACT

Introduction: periodontal disease and diabetes mellitus are conditions of multifactorial origin that are associated in a bidirectional way. Their study makes it possible to expand knowledge, achieve better oral health care and improve the quality of life of a large number of diabetic patients who currently suffer from chronic immunoinflammatory periodontal disease.

Objective: to describe the clinical-epidemiological characteristics of diabetic patients with chronic immunoinflammatory periodontal disease treated at the "Antonio Briones Montoto" Teaching Stomatology Clinic in Pinar del Río province.

Methods: an observational, descriptive, cross-sectional, descriptive study was carried out during the period November/2021 - April/2022. The universe was constituted by 62 diabetic patients attended in periodontics consultation of the Clinic. The sample was intentional, non-probabilistic and consisted of 59 patients who met the inclusion and exclusion criteria. The results were represented in statistical tables using absolute frequencies and percentages as summary measures, as well as Chi Square for a significance level of $p < 0,05$, degrees of freedom and calculation of probabilities.

Results: female sex (61 %) and patients in the 60 and older age group (42,4 %) predominated. Poor oral hygiene (88,1 %) was the risk factor that most affected the sample studied. Advanced forms of chronic immunoinflammatory periodontal disease predominated, with advanced periodontitis (49,2 %) being the most prevalent.

Conclusions: Chronic immunoinflammatory periodontal disease in the diabetic patients studied was characterized by female predominance and advanced age, with the presence of advanced periodontitis and poor oral hygiene.

Keywords: Periodontal Diseases; Epidemiology; Diabetes Mellitus; Risk Factors.

RESUMEN

Introducción: la enfermedad periodontal y la diabetes mellitus son padecimientos de origen multifactorial que se asocian de manera bidireccional. Su estudio posibilita ampliar conocimientos, lograr mejor cuidado de la salud bucal y elevar la calidad de vida de un gran número de pacientes diabéticos que actualmente sufren de enfermedad periodontal inmunoinflamatoria crónica.

Objetivo: describir las características clínico-epidemiológicas de los pacientes diabéticos con enfermedad periodontal inmunoinflamatoria crónica, atendidos en la Clínica Estomatológica Docente "Antonio Briones Montoto" de la provincia Pinar del Río.

Métodos: se realizó un estudio observacional, descriptivo, de corte transversal en el período noviembre/2021 – abril/2022. El universo estuvo constituido por 62 pacientes diabéticos atendidos en consulta de periodoncia de la Clínica. La muestra fue intencional no probabilística y quedó conformada por 59 pacientes que cumplieron los criterios de inclusión y exclusión. Los resultados se representaron en tablas estadísticas con la utilización de frecuencias absolutas y porcentos como medidas de resumen, así como Chi Cuadrado para un nivel de significación de $p < 0,05$, grados de libertad y cálculo de probabilidades.

Resultados: predominó el sexo femenino (61 %) y los pacientes del grupo de edad de 60 y más años (42,4 %). La higiene bucal deficiente (88,1 %) resultó ser el factor de riesgo que más afectó la muestra estudiada. Predominaron las formas avanzadas de la enfermedad periodontal inmunoinflamatoria crónica; la periodontitis avanzada (49,2 %) la de mayor prevalencia.

Conclusiones: la enfermedad periodontal inmunoinflamatoria crónica en los pacientes diabéticos estudiados se caracterizó por predominio femenino y edades avanzadas, con presencia de periodontitis avanzada y deficiente higiene bucal.

Palabras clave: Enfermedades Periodontales; Epidemiología; Diabetes Mellitus; Factores de Riesgo.

INTRODUCTION

Periodontal diseases are among the most common human diseases and affect more than 95 % of the population. Among the oral pathologies, they occupy the second place, both for their prevalence and their effects.⁽¹⁾

The term chronic immunoinflammatory periodontal disease refers to a group of inflammatory diseases that affect the supporting tissues of the teeth, gums, bone and periodontal ligament. Among them we can mention gingivitis and periodontitis.⁽²⁾

Nowadays, gingivitis is one of the pathologies that most frequently leads to the attendance of patients to stomatological services. It is a reversible immunoinflammatory process of the soft tissues surrounding the tooth, characterized by redness, edema and gingival bleeding. It starts with inflammation of the gum between the teeth, known as "interdental gingiva", which changes color and hurts at the slightest pressure.^(3,4)

Periodontitis is characterized by gum recession, gum separation, known as "periodontal pockets", bad breath or halitosis, as well as bone destruction and, if left untreated, causes tooth mobility in adults, with the probable loss of teeth and edentulism.^(4,5)

The role of local and general factors in the development of chronic immunoinflammatory periodontal disease such as dentobacterial plaque (DBP), poor oral hygiene, defective fillings, dental caries, calculus, mouth breathing, dental malposition and the presence of missing teeth that have not been restored has been discussed for years.^(6,7)

Diabetes is a chronic pathology that occurs when the body loses its ability to produce the necessary insulin and at the same time use it effectively. This disease is considered a risk factor for periodontal disease, regardless of age, gender and oral hygiene. The lesions produced in the periodontal tissues in diabetic patients are irreparable in young adults and in the elderly they destroy a large part of the natural dentition.^(3,8)

Diabetes is a public health problem whose impact in economic and social terms makes it a national and international priority. The World Health Organization (WHO) indicates that the number of people with diabetes in the world has increased from 30 million in 1995 to 347 million at present and it is estimated that by 2030 there will be 366 million.⁽⁹⁾

Diabetic patients are more susceptible to infection due to a combination of microangiopathies, metabolic acidosis and ineffective macrophage phagocytosis, which undoubtedly alters the host response to local irritants.^(4,10,11)

Periodontitis and diabetes are chronic, common and complex diseases with an established bidirectional relationship. Therefore, poor control of diabetes is associated with an increased prevalence and severity of periodontitis and periodontitis is associated with poor glycemic control.^(3,10,11)

Due to the above mentioned and taking into account the possible repercussion of diabetes mellitus in chronic periodontal inflammatory periodontal disease, the present research was carried out with the objective of describing the clinical-epidemiological characteristics of this disease in diabetic patients, attended at the "Antonio Briones Montoto" Teaching Stomatological Clinic in Pinar del Río province.

METHODS

An observational, descriptive, cross-sectional study was carried out, whose universe was constituted by 62 diabetic patients with chronic immunoinflammatory periodontal disease, attended in Periodontics consultation of the Stomatological Clinic "Antonio Briones Montoto" of Pinar del Río Municipality, during the period from November 2021 to April 2022.

The sample was intentional, non-probabilistic and consisted of 59 patients, taking into account for its selection that the patient was 18 years of age and older, as well as the informed consent of acceptance and participation in the research. Patients with edentulism, those with psychiatric conditions and patients with special needs were excluded.

Each patient underwent interrogation and meticulous clinical examination in a dental chair with good lighting by means of observation, palpation and exploration, using a classification set (mirror, forceps and explorer) and periodontal probe; taking into account the necessary biosecurity measures that included: cap, protective goggles, nasobuco, gown, overcoat and gloves.

The Individual Clinical History of Periodontics was prepared according to the established instructions. This document contained most of the epidemiological clinical information necessary for the investigation.

The analysis of the data was carried out using frequency distribution tables. The following variables were studied: age, sex, severity of periodontal disease and risk factors for periodontal disease (poor oral hygiene, presence of dental caries, dental calculus, smoking, missing teeth not replaced).

A bacterial dental plaque control was performed using plac dent tablets as a disclosing substance and Love's oral hygiene analysis index was calculated, which consists of the application of the formula: stained surfaces between the total surfaces examined by 100. The result was interpreted as adequate hygiene when the resulting value was below 20 % and inadequate hygiene when the value obtained was above 20 %.⁽³⁾

To determine the severity of periodontal disease, the WHO revised Russell Periodontal Index (R-RPI) was used. With this Index only the value assigned to the most severely affected tooth was recorded, assigning it a score according to the following criteria: ⁽¹²⁾

1. When there were no signs of inflammation of the gingival tissues or loss of function due to destruction of the supporting tissues. Bone, there was no presence of periodontal disease.
2. There was an evident area of inflammation of the marginal gingiva but it did not surround the entire tooth. This score corresponds to the presence of mild gingivitis.
3. When the existing inflammation completely surrounded the tooth, but there was no evident alteration in the epithelial adherence. This score corresponds to the presence of Advanced Gingivitis.
4. 6- When the epithelial adherence had been broken and there was the presence of a pocket (real), there was no interference in normal masticatory function, the tooth was firm and had not migrated. This score corresponds to the presence of Incipient or Mild Periodontitis.
5. 8- A score of 8 was assigned when a tooth was observed to have mobility, pathological migration and loss of function. This score corresponded to the presence of advanced periodontitis.^(4, 12)

A Microsoft Excel spreadsheet was used for data collection and statistical processing. The results were represented in statistical tables using absolute frequencies and percentages as summary measures, as well as Chi Square (χ^2), for a significance level of $p < 0.05$, degrees of freedom (GL) and calculation of probabilities (Prob.).

The study was approved by the Scientific Research Ethics Committee and Scientific Council of the institution. The principles and recommendations for biomedical research on human subjects adopted by the Declaration of Helsinki were followed, complying with fundamental ethical principles such as: respect for persons or autonomy, beneficence and non-maleficence, and the principle of justice.

The subjects under study were informed of the objectives and importance of their participation in the research and informed consent was obtained from each one of them.

RESULTS

Female sex predominated (61,0 %) and the age group 60 years and older (42,4 %) as shown in Table 1. There was correspondence between the observed and expected values.

Table 1. Distribution of diabetic patients with chronic immunoinflammatory disease according to age and sex. Antonio Briones Montoto" Stomatologic Clinic. 2021 - 2022.

Age groups (years)	Sexo				Total (n=59)	
	Male (n=23)		Female (n=36)			
	FA	%	FA	%	FA	%
18-34	3	13,0	6	16,7	9	15,3
35-44	4	17,4	7	19,4	11	18,6
45-59	5	21,7	9	25,0	14	23,7
60 y más	11	47,8	14	38,9	25	42,4
Total	23	100	36	100	59	100

$\chi^2 = 0.48$ GL. = 3 Prob. = 0.9232
Source: Individual Periodontal Medical Record

As shown in Table 2, there was a predominance of poor oral hygiene and dental calculus in both sexes (88,1 %). There is a close relationship between risk factors and the appearance of periodontal disease, with a marked increase in the male sex.

Table 2. Present risk factors for chronic immunoinflammatory periodontal disease in diabetic patients according to sex.

Risk factors for periodontal disease	Sexo				Total (n=59)	
	Male (n=23)		Female (n=36)			
	No.	%	No.	%	No.	%
Poor oral hygiene	20	87,0	32	88,9	52	88,1
Dental Caries	5	21,7	10	27,8	15	25,4
Dental calculus	19	82,6	25	69,4	44	74,6
Smoking habit	8	34,8	4	11,1	12	20,3
Missing teeth not restored	16	69,6	25	44,4	31	52,5

$X^2 = 3.90$ GL= 4 Prob. =0.4202
Source: Individual Periodontal Case History

As shown in Table 3, advanced periodontitis predominated with 49,2 % and mild periodontitis with 33,9 %. No significant differences were observed between the variables: severity of periodontal disease and sex.

Table 3. Severity of chronic immunoinflammatory periodontal disease in diabetic patients according to sex.

Severity of periodontal disease	Sexo				Total (n=59)	
	Male (n=23)		Female (n=36)			
	No.	%	No.	%	No.	%
Mild Gingivitis	1	4,3	2	5,6	3	5,1
Advanced Gingivitis	2	8,7	5	13,9	7	11,9
Mild Periodontitis	8	34,8	12	33,3	20	33,9
Advanced Periodontitis	12	52,2	17	47,2	29	49,2
Total	23	100	36	100	59	100

$X^2 = 0.44$ GL= 4 Prob. =0.9322
Source: Individual Periodontal Medical Record

DISCUSSION

The results show a predominance of periodontal disease in female patients. This coincides with that obtained by Martínez Pita and cols,⁽⁷⁾ in our province, who found 65,4 % of affected females. It differs from what was investigated by Tergas Díaz and cols,⁽³⁾ in Las Tunas, where 54,7 % of females presented gingival diseases and a higher prevalence of periodontitis was found in 61,3 % of male patients.

In the authors' opinion, the predominance of females with periodontal disease in this study is not very frequent considering that they pay more attention to their esthetics and physical appearance.

The literature consulted suggests that, among men, the prevalence of periodontal disease is higher than in women due to risk factors such as smoking, which, together with other conditions, have a greater impact on men and aggravate their oral health status.^(3,13)

The predominance of periodontal disease in adult patients aged 60 years and over, agrees with a study carried out in Matanzas by Villegas Rojas and cols,⁽²⁾ where the most affected age group (50 %) was 61 years and over.

The results of the study carried out in Manzanillo, Granma by Soler Otero and cols,⁽¹⁴⁾ were different. They found a higher percentage of affectation in the population from 20 to 29 years old with a total of 39 patients affected by periodontal disease for 38,2 %.

The number of patients was higher as age advanced; similar results were shown by Martínez Pita and cols,⁽⁷⁾ in their research. As the years go by, morphological changes occur in all tissues of the organism typical of aging and the oral cavity is not exempt from them.

The alterations observed in the cellular metabolic activity of periodontal tissues, such as: decreased vascularization, increased resorption, reduced position of the periodontium, as well as the ability to repair damage, decreased keratinization of the gingiva, which makes it less resistant to bacterial attacks and therefore these changes make the individual more susceptible to suffer from periodontal diseases.⁽⁷⁾

According to the authors' criteria, the lesions produced by periodontopathies in the supporting structures of the teeth, from their appearance in young adults, are irreparable and increase with age. Of the risk factors studied, there was a predominance of deficient oral hygiene. Similar results were found in studies carried out in the province of ,⁽¹⁴⁾ with 78,4 % of patients having deficient oral hygiene.

Tergas Díaz and cols,⁽³⁾ obtained different results: deficient oral hygiene was not the predominant risk factor; in this study stress was more frequent with 84,7 %. Likewise, Milenis Pita and cols,⁽⁷⁾ state that the risk factor that most affected the population studied was the presence of dental calculus, which affected 74,4 % of their patients.

In the present study, advanced stages of chronic immunoinflammatory periodontal disease predominated, a result that differs from that obtained by Leal Rodríguez and cols,⁽¹³⁾ in Caroní, Venezuela, in whose study mild gingivitis and mild periodontitis predominated with 23,7 % and 34,2 % respectively. This coincides with the high figures of chronic immunoinflammatory periodontal disease found in Chimborazo, Ecuador by Cuesta Guerra and cols,⁽¹⁵⁾ who reported 77,5 % of patients with chronic periodontitis.

This study confirms that periodontal disease is a condition of great relevance as a health problem, taking into account the morbidity it causes and the number of teeth that are lost because of it, which causes alterations from the psychological, functional and esthetic point of view for those who suffer from it. It should not be overlooked that periodontal disease conditions the worsening of glycemic control in diabetic patients and the risk of suffering other complications.⁽²⁾

In conclusion, chronic immunoinflammatory periodontal disease in the diabetic patients studied was characterized by female predominance and advanced age, with the presence of advanced periodontitis and poor oral hygiene.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Contribution of the Authors

DPA: conceptualization, formal analysis, critical review, research, supervision, project management, approval of the final version.

DMLF: conceptualization, data curation, formal analysis, research, approval of the final version.

MMP: data curation, research, resources, supervision, final version approval.

ICG: research, methodology, data presentation, approval of final version.

Additional material

Additional material to this article can be consulted in its electronic version available at: www.revcompinar.sld.cu/index.php/publicaciones/rt/suppFiles/5763

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