

OCCURRENCE OF AGGRESSIVE PERIODONTITIS IN PATIENTS AT A DENTAL SCHOOL IN SOUTHERN BRAZIL

Chirley Roberta Hermes¹, Simone Glesse Baumhardt¹,
Cassiano Kuchenbecker Rösing²

¹ University of Santa Cruz do Sul, Brazil

² Department of Periodontology, School of Dentistry,
Federal University of Rio Grande do Sul, Brazil

ABSTRACT

Aggressive periodontitis is a rare, severe and rapidly progressing periodontal disease. Early diagnosis is of utmost importance for establishing treatment in order to stop periodontal destruction and prevent tooth loss. The aim of this study is to describe the occurrence of aggressive periodontitis in patients at a Dental School in Brazil by means of a cross-sectional study. First, records from patients aged 15-36 years were consecutively scrutinized. Patients should not have systemic diseases. The search went up to 383 valid records. By means of periapical radiographs, the distance between the cement-enamel junction and the bone crest was measured. Records in which there was severe bone loss or periodontal destruction incompatible with the age of the patient were selected. Patients with bone loss ≥ 3 mm were called to answer a questionnaire and undergo periodontal examination, in order to confirm or dismiss the diagnosis of aggressive

periodontitis. From a total 383 records, 55.1% (211) were female and 44.9% (172) were male. In 3.9% (15) of the records, presumed diagnosis was aggressive periodontitis, and 12 out of those 15 eligible patients (80%) came in for clinical examination and confirmation or dismissal of the diagnosis. Aggressive periodontitis was diagnosed in 7 patients, corresponding to 1.8% of the total. Of these, 4 (1% of the total) presented generalized aggressive periodontitis and 3 (0.8% of the total) presented localized aggressive periodontitis. In 5 patients (1.3%) chronic periodontitis was diagnosed. It may be concluded, within the limits of the study, that aggressive periodontitis at this Dental School is compatible with world prevalence values, suggesting the need for periodontal diagnosis as from adolescence, considering the possible damage caused by this disease.

Key-words: periodontitis, aggressive periodontitis.

OCORRÊNCIA DA PERIODONTITE AGRESSIVA EM PACIENTES DE UMA FACULDADE DE ODONTOLOGIA NO SUL DO BRASIL

RESUMO

A periodontite agressiva é uma doença periodontal rara, grave e com rápida progressão. O diagnóstico precoce deste problema periodontal é de suma importância para o estabelecimento de um tratamento para que a destruição periodontal cesse e o elemento dental não seja perdido. A presente pesquisa tem como objetivo descrever a ocorrência da periodontite agressiva nos pacientes de um curso de Odontologia no Brasil, por meio de um estudo observacional transversal. Primeiramente, foram avaliados prontuários de pacientes que tinham entre 15 e 36 anos de idade de forma consecutiva, que não fossem portadores de doenças sistêmicas, até alcançar o número de 383 prontuários válidos para a pesquisa. Através das radiografias periapicais contidas no prontuário dos pacientes, foi mensurada a distância existente entre a junção cimento-esmalte e a crista óssea alveolar. Assim, foram selecionados aqueles prontuários em que a perda óssea era acentuada ou incompatível com a faixa etária do paciente. Naqueles pacientes em que a perda óssea era ≥ 3 mm, o paciente foi chamado para responder um questionário e realizar exames periodontais, a fim de con-

firmar ou não o diagnóstico de periodontite agressiva. Do total de 383 prontuários de pacientes que participaram da pesquisa, 55,1% (211) eram do sexo feminino e 44,9% (172) eram do sexo masculino. Em 3,9% (15) dos prontuários avaliados houve suspeita de periodontite agressiva, sendo que para a realização do questionário e exame periodontal 12 dos 15 pacientes elegíveis (80%) compareceram para a confirmação ou não do diagnóstico. A periodontite agressiva foi diagnosticada em 7 dos pacientes correspondendo a 1,8% do total dos prontuários. Destes, 4 (1,0% do total) apresentaram a forma generalizada da doença e 3 (0,8% do total) apresentaram a forma localizada. Em 5 pacientes (1,3%) foi confirmada a existência de periodontite crônica. Pode-se concluir, dentro dos limites do presente estudo, que a ocorrência de periodontite agressiva nos pacientes deste Curso de Odontologia é compatível com as prevalências mundiais, suscitando a necessidade de atenção diagnóstica periodontal desde a adolescência, frente aos possíveis danos da doença.

Palavras-chave: periodontite, periodontite agressiva.

INTRODUCTION

Aggressive periodontitis is a rapidly progressing disease whose main characteristics are accelerated loss of periodontal attachment and alveolar bone. Individuals classified as having aggressive peri-

odontitis may otherwise be healthy. Familial aggregation seems to be frequent. It is most prevalent in young people up to 35 years of age. It is assumed that microbial challenge is not sufficiently prevented by the host response^{1,2}.

Epidemiological data show varying degrees of occurrence. Estimates around the world are 0.4-0.8% in North America, 0.3-1.0% in South America, 0.1-0.5% in western Europe, 0.5-5.0% in Africa and 0.4-1.0 in Asia. These prevalence rates are dependent on the disease criteria utilized, as well as the type of examination. Links to socio-economic background and genetics have been proposed^{1,3,4}.

The clinical relevance of aggressive periodontitis is related to the fact that it affects young individuals, leading to periodontal and bone loss, which tends to elevate tooth loss rates. Thus, identification of individuals at risk, as well as strategies for screening such individuals, are of utmost importance.

The aim of this study was to assess the occurrence of aggressive periodontitis in patients seeking dental treatment at the Dental School of the University of Santa Cruz do Sul, in southern Brazil. A description of the encountered cases and possible understanding of the pattern of occurrence is provided.

MATERIALS AND METHODS

Study design

This is a cross-sectional descriptive study, looking at patient records as well as recruiting eligible individuals for examination.

Ethical considerations

The research protocol was approved by the Institutional Review Board of the University of Santa Cruz do Sul, in Brazil. Examined individuals read and signed an informed consent form.

Study population

The study was performed at the Dental School Clinic of the University of Santa Cruz do Sul. The clinic works mornings, afternoons and evenings throughout the week. Individuals seeking treatment at the clinic are recruited from the community, without restriction. Upon entering the system, every patient has an orthopantomogram, and complete periapical and bitewing radiographic set, after which he/she undergoes complete oral examination.

Sample

This research comprised the analysis of 383 records consecutively screened from individuals aged 15 to 36 years, without any systemic diseases. The analysis of the records was performed on the periapical radiographs, looking for individuals with bone loss ≥ 3 mm.

These individuals were called in order to confirm or dismiss the diagnosis of aggressive periodontitis. Sample size was estimated taking into consideration alpha and beta errors of 5% and 20%, leading to a number of 383.

Data collection

Data were collected after a pilot study comprising 4 patients. Data collection forms were established, looking at anamnesis data and measurements of the distance between the cement-enamel junction (CEJ) and the alveolar crest (AC).

Reliability of the measurements

Duplicate measurements of the clinical data were performed with a one-week interval. Visible Plaque Index and Gingival Bleeding Index had high degrees of correlation. Probing depth (PD) and Clinical Attachment level also revealed almost perfect agreement.

Periodontal Clinical Examination

Visible Plaque Index, Gingival Bleeding Index, Probing Depth, Clinical Attachment Level and Bleeding on Probing were assessed at four sites per tooth, excluding third molars.

Case definition

The patients participating in this survey received a thorough analysis of the periapical radiographs. When a distance between the CEJ and the AC was ≥ 3 mm, patients were called in for clinical examination and interview.

Individuals with Clinical Attachment Level (CAL) ≥ 3 mm in at least two permanent teeth, one of them being a first molar, and with not more than two other teeth besides first molars and incisors, were diagnosed with localized aggressive periodontitis. When at least three affected teeth were not first molars or incisors, the individuals were considered as having generalized aggressive periodontitis. The absence of any systemic disorder that could modify periodontal disease was mandatory for the diagnosis of aggressive periodontitis.

Data analysis

The data were analyzed descriptively in order to demonstrate the occurrence of aggressive periodontitis and the characteristics associated with the disease. Statistical comparisons between gender and skin color were tested by chi-square, at a level of 5%.

RESULTS

Fig. 1 shows the study flowchart. Out of a total 383 dental records examined for individuals of both genders (55.1% female and 44.9% male), bone loss $\geq 3\text{mm}$ was detected in 15 individuals (3.9%). These individuals were invited to attend a thorough clinical examination and 12 individuals were examined. Thus the response rate was 80%. Non-respondents were all males.

Table 1 shows the characteristics of the individuals examined. Of the 12 individuals examined, 7 were

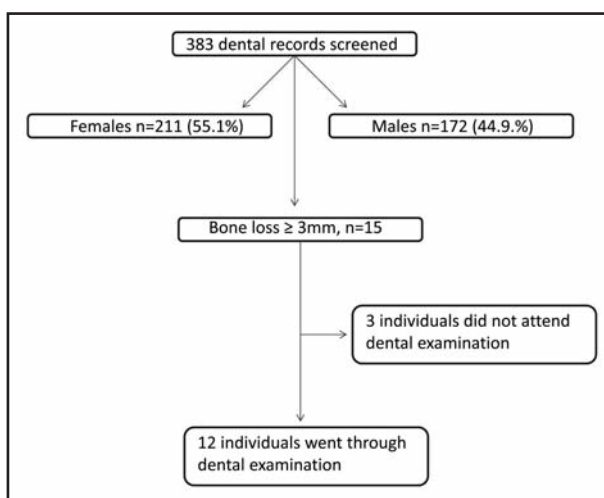


Fig. 1: Study Flowchart.

Table 1: Demographics (n=12).

Variable	n(%)
Male	7(58.3)
Female	5(41.7)
Skin color white	7(58.3)
Skin color non-white	5(41.7)
Smokers	2(16.7)
Mean age	32.58 years

Table 2: Diagnosis and occurrence rate of periodontal disease in the patients examined (considering total dental records, n=383).

Diagnosis	n (%)
Aggressive periodontitis	7 (1.8)
Generalized Aggressive Periodontitis	4 (1.0)
Localized Aggressive Periodontitis	3 (0.8)
Chronic periodontitis	5 (1.3)

male and 5 were female, and regarding skin color, 7 were white and 5 were non-white. No statistically significant difference was observed between gender and skin in the participating group.

Table 2 shows the diagnosis of periodontal disease among the individuals participating in this study. Aggressive periodontitis was detected in 1.8%. When chronic periodontitis is considered according to total dental records examined, the rate is 1.3%. Generalized and localized forms of aggressive periodontitis had similar distribution: 1.0% and 0.8% of the total, respectively.

In addition to these findings, it should be noted that the two smokers who were examined were diagnosed with periodontitis – one with aggressive periodontitis and the other with chronic periodontitis. It should also be emphasized that the most severe case of aggressive periodontitis was diagnosed in one of the smokers. Moreover, of the 7 cases of aggressive periodontitis, 2 pairs of siblings (one pair of males and one pair of females) were diagnosed with the problem. The pair of females had localized aggressive periodontitis and the pair of males had generalized aggressive periodontitis.

DISCUSSION

The aim of this cross-sectional study was to establish the occurrence of aggressive periodontitis in patients seeking dental treatment at a Dental School in southern Brazil. Out of a total of 383 dental records, 15 individuals were considered to be possible aggressive periodontitis patients and were called in for thorough periodontal examination. An occurrence of 1.8% of aggressive periodontitis was observed.

For better understanding of the context of this study, some methodological characteristics should be highlighted. A consecutive search in dental records from a Dental School was made. Typically, individuals seeking dental treatment might not represent the situation of the whole population. However, in order to provide enough strength for such an investigation, a sample size estimation was performed, thus allowing at least for internal validity claim. Thus, a consecutive search was performed and all radiographs were examined for bone loss. A cutoff point of a distance between the CEJ and the AC $\geq 3\text{mm}$ was used. The novelty in this investigation is to take the opportunity of looking at radiographic examinations to screen individuals for thorough

periodontal examination for diagnosis of aggressive periodontitis.

The study included individuals aged 16-36 years, taking into consideration that despite the fact that aggressive periodontitis is not restricted to adolescents and young adults, prevalence in this age group tends to be higher¹.

Considering eligibility criteria, individuals with systemic diseases were not included. This decision is related to the fact that the classification system clearly states that in order for an individual to be classified as having aggressive periodontitis, systemic diseases should be ruled out.⁵ Carvalho et al.⁶ also did not include individuals with systemic diseases in order to diagnose aggressive periodontitis. Rapp et al.⁷, looking at a family of individuals with aggressive periodontitis, did not observe any member of the family with systemic disorders.

The clinical examination performed on the eligible individuals included all teeth, except third molars, which is a recommendation for diagnosis. This was performed by an examiner with good levels of reliability, thereby increasing the quality control of the study. Additionally, the response rate was satisfactory, since 80% of the possible examinees came for consultation and underwent clinical examination. The study used the diagnosis criteria recommended by the American Academy of Periodontology, allowing comparisons with other studies⁵.

The occurrence of aggressive periodontitis was 1.8%, i.e. 7 out of 383 possible cases. This occurrence might seem low, however, it is in accordance with the majority of studies in the literature^{1,3,8-11}. The diagnosed cases revealed that 1.0% (4 individuals) had generalized and 0.8% (3 individuals) had localized forms of the disease. Cortelli et al.⁸ and Carvalho et al.⁶ also observed higher prevalence of generalized than localized aggressive periodontitis. On the other hand, Imran and Ataa¹¹ observed higher rates of the localized form of disease.

The results of this study differ from most studies related to ethnic background. In this study, 2 aggressive periodontitis patients were non-white and 5 were white. This subject has been extensively discussed in the literature. Bial and Mellonig¹² and Elamin et al.¹³ observed higher prevalence in Afro descendants. In Brazil, Susin and Albandar¹ demonstrated that non-whites are at higher risk of aggressive periodontitis, although not directly linking this to genetic background. Although skin color could

be related to genetic features, in most countries, it is a proxy of low socio-economic background. Socio-economic data were not collected in this study. Dental School patients might include individuals from all social strata. However, it is most likely that the less privileged seek treatment at schools. Additionally, it should be remembered that Brazil has an extensive mixture of ethnic backgrounds and the region was previously colonized by Europeans, mainly Germans. Therefore, the higher occurrence of aggressive periodontitis observed in whites in the present study might be random.

Carvalho et al.⁶ suggested genetic factors in the occurrence of aggressive periodontitis. In this study, two pairs of siblings were diagnosed with the disease. Marazita et al.¹⁴ demonstrated that siblings of individuals with aggressive periodontitis may also be affected. Ababneh et al.⁹ also observed that individuals with a family history of periodontal disease had 5 times higher risk of aggressive periodontitis. Smoking is a known risk factor for periodontal diseases. Studies in young individuals might not clearly present the effect of smoking. In our study, only one of the diagnosed individuals smoked. This individual had with the worst periodontal scenario. Additionally, one of the chronic periodontal disease patients examined was also a smoker. Susin and Albandar¹ demonstrated that smoking also increases the risk of aggressive periodontitis. In adults, Albandar et al.¹⁵ demonstrated a higher prevalence of moderate-severe periodontal disease in smokers. Disease features possibly modified by smoking included gingival recession and tooth loss. Mullally, Breen and Linden¹⁶ also observed higher prevalence of early onset periodontitis in smokers.

In the present study, 4 males and 3 females were diagnosed with aggressive periodontitis. This is a controversial finding in the literature. Cortelli et al.⁸, suggested that females had 65% higher risk of developing aggressive periodontitis. However, the difference in the present study is very limited, such as that encountered by Eres, Saribay and Akkaya¹⁰, who observed 10 females and 8 males. On the other hand, Ababneh et al.⁹ and Borrel et al.¹⁷ demonstrated higher prevalence of aggressive periodontitis in males. Studies in chronic periodontitis, independently of age, suggest higher occurrence among males.

This study used radiographs for screening possible aggressive periodontitis patients. The measurement of the distance from the CEJ to the AC is useful for

screening¹². Our findings revealed that this was effective. It is not known from the data in this study whether individuals without bone loss, not included in the eligibility criteria, would be diagnosed with aggressive periodontitis. This is part of the uncertainty of this study, and a subject for future research.

CORRESPONDENCE

Cassiano Kuchenbecker Rösing
Rua Dr. Valle, 433/701
90560-010 – Porto Alegre, RS – Brasil
ckrosing@hotmail.com

REFERENCES

1. Susin C, Albandar JM. Aggressive periodontitis in a urban population in southern Brazil. *J Periodontol* 2005;76:468-475.
2. Wiebe CB, Putnins EE. The Periodontal Disease Classification System of the American Academy of Periodontology – An Update. *J Canad Dent Assoc* 2000;66:594-597.
3. Albandar JM, Tinoco EMB. Global epidemiology of periodontal diseases in children and young persons. *Periodontol* 2000. 2002;29:153-176.
4. Borrel LN, Crawford ND. Socioeconomic position indicators and periodontitis: examining the evidence. *Periodontol* 2000. 2012; 58:69-83.
5. Armitage G. Development of a classification system for periodontal diseases and conditions. *Ann Periodontol* 1999;4:1-6.
6. Carvalho FM, Tinoco, EM, Goyil M, Marazita ML, Vieira, AR. Aggressive periodontitis is likely influenced by a few small effect genes. *J Clin Periodontol* 2009;36:468-473.
7. Rapp GE, Pineda-Trujillo N, McQuillinA, Tonetti M. Genetic power of a Brazilian three-generation family with generalized aggressive periodontitis II. *Braz Dent J* 2011;22:68-73.
8. Cortelli JR, Cortelli SC, Pallos D, Jorge AO. Prevalence of aggressive periodontitis in adolescents and Young adults from Vale do Paraíba. *Pesqui Odontol Bras* 2002;16:163-168.
9. Ababneh KT, Hwajj ZMFAH, Khader Y. Prevalence and risk indicators of gingivitis and periodontitis in a Multi-Centre study in North Jordan: a cross sectional study. *BMC Oral Health* 2012;3:12.
10. Eres G, Saribay A, Akkaya M. Periodontal treatment needs and prevalence of localized aggressive periodontitis in a young Turkish population. *J Periodontol* 2009;80:940-944.
11. Imran AG, Ataa MAS. Prevalence of aggressive periodontitis among Yemeni students from schools in the city of Thamar. *Revista Sul-Brasileira de Odontologia* 2010;7: 325-331.
12. Bial JJ, Mellonig JT. Radiographic evaluation of juvenile periodontitis (periodontosis). *J Periodontol* 1987;58:321-326.
13. Elamin AM, Skayg N, Ali RW, Bakken V, Albandar JM. Ethnic disparities in the prevalence of periodontitis among high school students in Sudan. *J Periodontol* 2010;81: 891-896.
14. Marazita ML, Burmeister JA, Gunsolley JC, Koertge TE, Lake K, Schenkein HA. Evidence for autosomal dominant inheritance and race-specific heterogeneity in early-onset periodontitis. *J Periodontol* 1994;65:623-630.
15. Albandar JM, Streckfus CF, Adesanya MR, Winn DM. Cigar, pipe, and cigarette smoking as risk factors for periodontal disease and tooth loss. *J Periodontol* 2000;71: 1874-1881.
16. Mullally BH, Breen B, Linden GJ. Smoking and patterns of bone loss in early-onset periodontitis. *J Periodontol* 1999;70:394-401.
17. Borrel LN, Burt BA, Neighbors HW, Taylor GW. Social factors and periodontitis in an older population. *Am J Public Health* 2008;98:s95-101.