Journal of Dentomaxillofacial Radiology, Pathology and Surgery

Winter 2021, Volume 10, Number 1

Research Paper: Determination of frequency distribution of aggressive periodontitis in dental clinic of Rasht dental school in 2016-2017

Bardia vadiati Saberi[1] ,Pouya nejad shamsi[2], Mastane zamindar[3],Dorsa rahi*[4]

[1]*Dental Sciences research centre, Department Of Periodontics, School of dentistry ,Guilan university of medical science ,Rasht,Iran*

[2]*Assistant professor, Department Of Endodontics, School of dentistry ,Guilan university of medical science ,Rasht,Iran*

[3] *Dentist*

[4] *Dental Sciences research centre, School of dentistry ,Guilan university of medical science ,Rasht,Iran*

Use your device to scan and read the article online

Citation: Vadiati Saberi B, nejad shamsi P, Zamindar M ,Rahi D. Determination of frequency distribution of aggressive periodontitis in dental clinic of Rasht dental school in 2016-2017. Journal of Dentomaxillofacial Radiology, Pathology and Surgery.2021;10(1):34-39.http://dx.doi.org/10.32598/3dj.7.4.145

http://3dj.gums.ac.ir

Article info:
Received: 2021/02/11
Accepted: 2021/02/26

Keywords:
Aggressive Periodontitis
Periodontics
Dental Care

ABSTRACT

Introduction: Aggressive periodontitis is a type of periodontal disease that affects systemically healthy individuals usually under the age of 30 years. It is characterized by rapid bone destruction, which is not proportionate to the quantity of bacterial plaque. The purpose of the present study was to determine the frequency of aggressive periodontitis in periodontics clinic of Rasht dental school in one year period.

Materials and Methods: In this cross-sectional study, 412 patients were selected among those presenting to the Periodontics clinic of Rasht Dental School during 2016-2017 by convenience sampling. The probing pocket depth (PPD) at 6 areas around the incisors and first molars was recorded for each patient. Those with PPD ≥ 4 mm in more than one tooth were referred for radiographic examination. After extraction of relevant clinical trial parameters, data were analyzed by a descriptive statistical method using IVM SPSS Statistical Software (Version 25).

Results: Of examined patients, only 2 fulfilled the diagnostic criteria for localized aggressive periodontitis. No one was diagnosed with generalized aggressive periodontitis. The frequency of aggressive periodontitis among the patients was %0.48.

Conclusion: The current results were different from those of previous studies on the same age groups with similar diagnostic criteria conducted in other countries. This difference can be attributed to the difference in sample size and different epidemiological patterns of the disease in our target city, Rasht.

Corresponding Author:
Dorsa Rahi.
Address: Dental research centre, School of Dentisry, Guilan University of Medical Sciences, Rasht, Iran.
Tel: 09127754396
E-mail: Rahi.dorsa@gmail.com

Journal of Dentomaxillofacial Radiology, Pathology and Surgery

Introduction

Periodontal disease is highly prevalent in human communities, and is among the main causes of tooth loss along with dental caries. Preserving the health of the tooth supporting structures is a prer equisite for most dental treatments. The success of all dental procedures depends on periodontal health. This can be achieved by paying attention to the chief complaint of patients, obtaining complete history, and conduction of complete clinical and paraclinical examinations in the treatment process(1,2).

Aggressive periodontitis may manifest in two forms of localized and generalized with two common characteristics of attachment loss and rapid bone loss, in an otherwise healthy patient. The prognosis of aggressive periodontitis depends on its type (localized or generalized), degree of bone destruction at the time of diagnosis, and the ability to control the disease progression in the future(3,4).

Localized aggressive periodontitis often involves first molars and incisors of patients under the age of 30 years, who are systemically healthy. Factors such as age, gender, and race of patient, speed of disease progression, composition of subgingival microbial flora, change in host immune response, and genetics may be implicated in development of localized aggressive periodontitis. If diagnosed early, this condition may be treated conservatively by oral hygiene instruction and systemic antibiotic administration, with excellent prognosis. Advanced cases can still have a good prognosis given that debridement is performed and the patients receive local and systemic antibiotics and undergo regenerative treatment. Otherwise, the prognosis would be fair, poor or questionable, and eventual loss of permanent teeth may occur. Tooth loss can have adverse physical, psychological and financial consequences for patients. Thus, better understanding of aggressive periodontitis and knowledge about the correct and in time diagnosis and treatment of this condition can bring about positive results(3,5).

Generalized periodontitis rarely heals spontaneously; however, spontaneous healing of localized periodontitis has been reported. But, in determination of prognosis, the clinicians should consider specific aspects of the disease in

localized periodontitis. Localized aggressive periodontitis often develops around the puberty age. Although patients with generalized aggressive periodontitis are also young, they have poor antibody response to infective agents, and they often suffer from generalized attachment loss in the interproximal areas. Secondary predisposing factors, such as cigarette smoking, are often present in association with change in host's defense mechanisms. As a result, the patients do not often respond well to conventional periodontal therapy. Such patients often have fair, poor or questionable prognosis. Some patients present with extensive periodontal destruction in young ages, occurring in a short period of time. Due to poor response to conventional treatment, management of such patients is often challenging.

This type of periodontal disease often develops due to microbiological invasion in a susceptible host with no immunodeficiency. Thus, there is a possibility that alterations in some other unknown host response mechanisms may be responsible for its development. Most of these periodontal patients are not successfully treated with the conventional methods, and dental clinicians should use a combination of different therapeutic approaches to increase the success rate of treatment(6,7).

To the best of the authors' knowledge, no comprehensive study is available regarding the prevalence of aggressive periodontitis in Guilan Province. Thus, considering the significance of this information, this study aimed to assess the prevalence of aggressive periodontitis in the Periodontology Clinic of Rasht dental school in one year in 2016-2017.

Materials and Methods

In this descriptive cross-sectional study, the target population comprised of 412 patients presenting to the Periodontology Clin

Vadiati Saberi B, et al. Determination of frequency distribution of aggressive periodontitis in dental clinic of Rasht dental school in 2016-2017. Journal of Dentomaxillofacial Radiology, Pathology and Surgery.2021;10(1):34-39.http://dx.doi.org/

ic of Rasht Dental School, during 2016-2017.

The patients were selected among those presenting to the Periodontology Clinic of Rasht Dental School, during 2016-2017 by simple random sampling. The minimum sample size to estimate the frequency of aggressive periodontitis with 0.05 accuracy at 95% confidence interval was calculated to be 412.

This study was conducted in two phases. In the first phase, after patient selection, the patient records were evaluated and the required information was extracted and recorded in a checklist. The checklist included patients' demographic information, i.e. their age, gender, and level of education. In the second phase, the patients were clinically examined under dental unit light with a dental mirror. The probing pocket depth (PPD) was measured as the distance between the gingival margin and pocket depth at 6 points of distobuccal, midbuccal, mesiobuccal, distolingual, midlingual, and mesiolingual of first molars and incisors using a Williams probe from smith care company made in Pakistan with 1 mm accuracy. All patients were examined by a periodontist. Periapical radiographs were obtained from the first molars and incisors by the parallel technique. The distance between the cementoenamel junction and the interdental bone level was measured by a caliper with 0.1 mm accuracy. Complete clinical examination included the following:

Assessment of plaque index (PI) according to Silness and Loe: which categorized the amount of plaque in three groups of low, moderate and severe (7).

Assessment of the amount of calculus using the Simplified Oral Hygiene Index. The calculus index (CI) included three categories of good, moderate and bad(8).

Assessment of gingival inflammation by calculating the Silness and Loe gingival index (GI) with three categories of mild, moderate and severe (9). The PPD and presence/absence of local stimuli at areas of bone resorption were also determined(9).

Immunocompromised patients and those with systemic diseases affecting the periodontium were excluded from the study. Other exclusion criteria were presence of overhang, proximal caries, open proximal contact, presence of orthodontic bands or crowns, malocclusion, and PI or GI >2 and CI > 1.8 in the examined teeth with bone loss(10-12).

The patients with the following criteria were diagnosed with localized aggressive periodontitis (2,13,14):

Common characteristics in patients with localized aggressive periodontitis:

- Onset of disease during the pubertal period
- Local involvement of first molars or incisors characterized by interproximal attachment loss in at least two permanent teeth, one of which had to be a first molar.
- Significant increase in level of antibody in response to infective agents

Common characteristics in patients with generalized aggressive periodontitis:

- Commonly (but not always) involving patients under 30 years of age
- Generalized loss of interproximal attachments in at least 3 teeth in addition to first molars and incisors
- Significant periodontal destruction with episodic nature
- Poor response of serum antibody to infective agents (2,15,16).

After extraction of relevant clinical trial parameters, data were analyzed by a descriptive statistical method using IVM SPSS Statistical Software (Version 25)

The study was approved by the ethics committee of School of Dentistry, Guilan University of Medical Sciences (IR.GUMS.REC.1395.329). The checklists were filled out anonymously, and patients signed written informed consent forms prior to participation in the study

Results

A total of 412 patients presenting to the Periodontics Department of Rasht Dental School in 2016 who were selected by simple random

sampling underwent clinical periodontal examination. Of all, 31 patients had a PPD ≥ 4 mm in primary clinical examination, and were recalled for additional clinical examination and radiography. On radiographs, 20 patients did not have bone resorption; 9 patients were diagnosed with chronic periodontitis despite the presence of periodontal pockets and bone loss since they had high PI, GI, and CI.

Only 2 patients met the criteria for localized aggressive periodontitis, both of which were females and under 20 years of age. They both had a level of education below high-school diploma (Table 1). No patient was diagnosed with generalized aggressive periodontitis.

Thus, the frequency of localized aggressive periodontitis in patients presenting to the Periodontics Department of Rasht Dental School in 2016 was 0.48%.(Table1)

Table 1. Demographic information of patients with localized aggressive periodontitis

Patient	Gender	Age	Educational level	Plaque index	Gingival index	Calculus index
Patient1	Female	16 yrs	Below high-school diploma	2	2	1/1
Patient 2	Female	17 yrs	Below high-school diploma	2	1/1	2

table 2 presents the demographic information of all patients.(Table2)

Age < 20 years (%) >20 years (%) Mean age	(56%/79)234 (43%/20)178 31 years
Gender Female (%) Male (%)	(58%/25)240 (41%74)172
Level of education	(43%/68)180
Below high-school diploma (%) High-school diploma or higher (%)	(56%/31)232

Discussion

The first step in strategy planning is to acquire adequate knowledge about the current status of the problem. Thus, studies on the prevalence of a disease or a specific condition can play an important role in prevention, control or treatment of the respective disease. This study evaluated 412 patients presenting to the Periodontology Clinic of Rash Dental School. Of all patients, only 2 were diagnosed with localized aggressive periodontitis.

Although the age of onset of localized aggressive periodontitis is around the puberty age (14), evidence shows that a small number of affected patients are younger than 15 years(9,17-19). This is probably due to the insignificant level of destruction and absence of radiographic evidence. Radiographic interpretation of the distance between the CEJ and alveolar bone crest on bitewing radiographs may vary from 0.9 mm to 1.6 mm (2,20). Presence of 2 mm distance between the CEJ and alveolar bone crest may indicate periodontitis (2). A previous study on jaw models reported that the normal distance between the CEJ and alveolar bone crest is 1-2 mm (11). The prevalence of localized aggressive periodontitis in European countries such as Finland, Denmark, Switzerland, UK, and Netherlands is reportedly 0.1% (11,14,22-24). The prevalence of localized aggressive periodontitis was 0.76% in a study conducted in Spain on 17-26-year-olds, 0.42% in 17-23-year-olds in Asian countries such as the Saudi Arabia(25), 0.47% in 19-28-year-olds in Japan(26), 0.53% in 14-17-year-olds in the United States (27), and 0.8% in 12-19-year-olds in Nigeria (28). Comparison of the studies indicates that age is important in assessment of disease prevalence, as the prevalence rates are almost the same in similar age groups while studies on older patients have reported higher prevalence rates.

Araszadeh et al. evaluated 1068 individuals between 15-17 years in different regions of Sabzevar city and reported the frequency of aggressive periodontitis to be 8 patients (30). Sadeghy et al, in 2003 evaluated the prevalence of aggressive periodontitis in female students between 15-18 years in Tehran high-schools and reported the frequency of aggressive periodontitis to be 0.14% (31). Eres G et al, in 2009 in Turkey evaluated the periodontal treatment needs, and prevalence of localized aggressive

periodontitis in 3056 teenagers between 13-19 years and reported its frequency to be 0.58%(31). The obtained frequency value in their study was not similar to that in other studies, considering the age range and diagnostic criteria.

Iran is a semi-industrial Asian country, and its dominant population consists of Iranian Persians. According to Saxby, aggressive periodontitis in non-industrial Asian countries is more prevalent than in industrial European countries(22). Also, according to Saxby, Harley, Melvin, and Aass, it is more common in black people compared with Caucasians (21,22,27,33). Thus, aggressive periodontitis is expected to have a higher prevalence in our country, compared with European countries, and the results show a higher prevalence rate compared with European countries. No study is available regarding the frequency of aggressive periodontitis in Persians.

Controversy exists regarding the correlation of aggressive periodontitis with level of education. Albandar et al, in their study in Uganda found no significant correlation between the socioeconomic status and level of education with the frequency of aggressive periodontitis(26). However, Lopez et al, in Chili and Gjermo et al, in Brazil showed higher frequency of aggressive periodontitis in groups with lower socioeconomic status and level of education (10,33).

This study was a descriptive analytical study; thus, the correlation of level of education and aggressive periodontitis could not be analyzed. A case-control study is required to analyze this correlation.

Suggestions

Considering the current results and differences with the findings of other studies conducted in Iran, further studies with larger sample size and longer duration are required to find the epidemiological pattern of aggressive periodontitis in Rasht.

Conclusion

The results showed that the frequency of aggressive periodontitis in patients presenting to the Periodontology Clinic of Rash Dental School was 0.48%. This result was different from the findings of similar studies conducted in other cities. This difference can be due to our smaller, non-homogenous sample size compared with other study populations as well as shorter study period. Moreover, other studies have been conducted in other geographical locations on patients with different levels of oral hygiene. All these factors can explain the controversy in the results. Both patients diagnosed with aggressive periodontitis in this study were females, and under 20 years of age. No definite conclusion can be drawn regarding the relationship of aggressive periodontitis and level of education due to small sample size and age range of patients (< 20 years) (10,27,33).

This study was conducted in Iran, and no black people were present in this study. Thus, the results cannot be optimally generalized to black or Caucasian populations.

Acknowledgement

We acknowledge that all the financial support and funding were provided by the Deputy of Research, Guilan University of Medical Sciences.

Conflicts of interest

There are no conflicts of interest

References

1. Mata C da, The relationship between oral-health-related quality of life and general health in an elderly population: A cross-sectional study , Journal Gerodontology Association and John Wiley & Sons Ltd,2019;36(1):71-7 https://doi.org/10.1111/ger.12384https://doi.org/10.1111/ger.12384

2. Carranzas clinical periodontology. 12th.Missuri: Mosby, 2015; 1(3): p45-47; 1(4): p145-295; 3(7): p112-121; 6(33): p534-535, 7(40): 656.

3. Lang NP, Lindhe J, editors. Clinical Periodontology and Implant Dentistry.12th. John Wiley & Sons; 2015, Vol 1; 6(19): p428-449; Vol 2.; 6(19): p428-449.

4. Löe.H, Anerud. A, Boysen.H, Morrison.E. Natural history of periodontal disease in man Rapid, moderate and no loss of attachment in Sri Lankan laborers 14 to 46 years of age. Journal of Clinical Periodontology ,1986;8(2): 431-440;https://doi.org/10.1111/j.1600051X.1986.tb01487.xhttps://doi.org/10.1111/j.1600-051X.1986.tb01487.x

5. Croxson LJ. Periodontal awareness: the key to periodontal health. International dental journal. 1993;43(2 Suppl 1):167-77.

6. Neville BW, Damm DD, Chi AC, Allen CM. Oral and maxillofacial pathology. Elsevier Health Sciences; 2015; 1(4): p185-190.

7. Silness P, Loe H. Periodontal disease in pregnancy. Acta odontol scand,1964;22(1). 121-35.https://doi.org/10.3109/00016356408993968

8. Green JC, Vermillion JR. The simplified oral hygiene index. J Am Dent Asso 1964; 68(2): 7-13.https://doi.org/10.14219/jada.archive.1964.0034

9. Loe H, Silness J. Periodontal disease in prwgnancy. Acta Odontol Scand 1963;21(3): 533.https://doi.org/10.3109/00016356309011240

10. López NJ, Ríos V, Pareja MA, Fernández O. Prevalence of juvenile periodontitis in Chile. Journal of Clinical Periodontology. 1991;18(7):529-33.https://doi.org/10.1111/j.1600-051X.1991.tb00085.x

11. Kronauer E, Borsa G, Lang NP. Prevalence of incipient juvenile periodontitis at age 16 years in Switzerland. J Clin Periodontal 1986; 13(2): 103-8.https://doi.org/10.1111/j.1600-051X.1986.tb01441.x

12. Page RC, Kornman KS. The pathogenesis of human periodontitis: an introduction. Periodontology 2000. 1997;14(1):9-11..https://doi.org/10.1111/j.1600-0757.1997.tb00189.x

13. Saxen MS. Prevalence of Juvenile Periodontitis in Finland. J Clin periodontol 1980; 7(3): 177-86https://doi.org/10.1111/j.1600-051X.1980.tb01961.x

14. Bear PN. The case for periodontosis as a clinical entity. J Periodontol 1971; 42(8): 516-20.https://doi.org/10.1902/jop.1971.42.8.516

15. Lang N, Bartold PM, Cullinas M, Jeffcoat M, Mombelli A, Murakami S, et al. Concensus report: aggressive periodontitis. Ann Periodontol 1999;4(1):53. https://doi.org/10.1902/annals.1999.4.1.53

16. Tonetti MS, Mombelli A. Early onset periodontitis. Ann Periodontol 1999; 4: 39 53.https://doi.org/10.1902/annals.1999.4.1.39

17. Manson JD, Lehner J. Clinical features of Juvenile Periodontitis. J Periodontol,1974; 45(1):636-40.https://doi.org/10.1902/jop.1974.45.8.2.636

18. Hormand J, Frandsen A. Juvenile Periodontitis. Localization of bone loss in relation to age, sex and teeth. J clin Periodont 1979; 6(1):407-16.https://doi.org/10.1111/j.1600-051X.1979.tb01939.x

19. Aass AM, Albandar J, Aasenden R, Tollefsen T, Gjermo P. Variation in prevalence of radiographic alveolar bone loss in subgroups of 14 year old school children in Oslo. J Clin Periodontol 1988; 15(1):130-133.https://doi.org/10.1111/j.1600-051X.1988.tb01006.x

20. Polson AM, Reed BE. Long term effect of orthodontic treatment on crestal alveolar bone levels. J Periodontol 1984;55(1):28-34.https://doi.org/10.1902/jop.1984.55.1.28

21. Stoner JE. An investigation into the accuracy of measurements made on radiographs of alveolar crests of dried mandibles. J Periodontol 1972 ;43(3): 699-701. https://doi.org/10.1902/jop.1972.43.11.699

22. Hoover JN, Ellegaard B, Attstorm R. Radiographic and clinical examination of Periodontal status of firs molars in 15-16 year old Danish school children. Scand J Dent Res 1981; 89(3): 260-3.https://doi.org/10.1111/j.1600-0722.1981.tb01680.x

23. Saxby MS. Juvenile periodontitis: An epidemiological study in the west midlands of the United Kingdom. J clin Periodontol 1987; 14(10): 594-8.https://doi.org/10.1111/j.1600-051X.1987.tb01521.x

24. Van der Velden U, Abbas F, Van Steenbergen TJM, De Zoete OJ, Hesse M, De Ruyter C, et al. Prevalence of periodontal breakdown in adolescents and presence of Actinobacillus actinomycetemcomitans in subject with attachment loss. J Periodontol 1989; 60(11) :604-10https://doi.org/10.1902/jop.1989.60.11.604

25. Kowashi Y. Prevalence of Juvenile Periodontitis among students at Nagasaki University. Adv Dent Res 1988; 2(2): 395-6.https://doi.org/10.1177/08959374880020023501

26. Nassar MM, Afifi O, Deprez RD. The prevalence of Localized juvenile periodontitis in Saudi subjects. J Periodontol 1994; 65(7): 698-701.https://doi.org/10.1902/jop.1994.65.7.698

27. Harley AF, Floyd PD. Prevalence of juvenile periodontitis in schoolchildren in Lagos, Nigeria. Community dentistry and oral epidemiology. 1988;16(5):299-301. https://doi.org/10.1111/j.1600-0528.1988.tb01780.x

28. Loe H, Brown LJ. Early onset periodontitis in the United States of America. J Periodontol ,1991;62(10): 608-16.https://doi.org/10.1902/jop.1991.62.10.608

29. H Assarzadeh, Prevalence and Periodontal Treatment Needs of Aggressive Periodontitis,in Students of Specific part of Iran, Journal of International Dental and Medical Research ISSN 1309-100X, Vol 13 · No· 2 · 2020

30. Melvin WL, Sandifer JB, Gray JL. The prevalence and sex ratio of juvenile periodontitis in a young racially mixed population. Journal of periodontology.1991;62(5):330-4.https://doi.org/10.1902/jop.1991.62.5.330

31. Sadeghi R. Prevalence of aggressive periodontitis in 15-18 year old school children in Tehran, Iran. Community Dent Health. 2010; 27(2): 57- 59.

32. Eres G, Saribay A, Akkaya M. Periodontal treatment needs and prevalence of localized aggressive periodontitis in a young Turkish population. Journal of periodontology. 2009;80(6):940- 4.https://doi.org/10.1902/jop.2009.080566

33. Gjermo P, Bellini HT, Pereira Santo V, Martins JG, Ferracyoli JR. Prevalence of bone loss in a group of Brazilian teenagers assessed on bitewing radiographs. J Clin Periodontol 1984; 11(2): 104-13.https://doi.org/10.1111/j.1600-051X.1984.tb00838.x