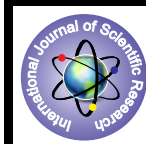


Prevalence and Localization of Gingival Recessions in a Sample of Portuguese Adults.



Health Science

KEYWORDS : gingival recession, prevalence, maxilla, mandibular, incisors, canines, premolars and molars.

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ABSTRACT

Background: Gingival recession is a clinical condition defined as the attachment loss that results in apical migration of the free gingival margin. We intend to determine the prevalence of recession depending on its etiology and possible complications that may outcome in a sample of patients that attended a dental appointment at the University Clinic of Portuguese Catholic University in Viseu, Portugal.

Materials and methods: We conducted a cross-sectional study where we assessed a sample of 101 patients at the University Clinic of Portuguese Catholic University in Viseu, Portugal with a mean age of 23.11 ± 2.23 years old. The participants were subjected to a questionnaire regarding issues related to risk factors associated with gingival recessions and a clinical intra-oral examination was performed in order to identify and measure gingival recession and assess possible etiological factors.

Results: The prevalence of recession was 85.1%, of which 24.8% had recessions with more than 3mm. Among the individuals with gingival recessions, the presence of vestibular recessions was 97.7% and palatal / lingual recessions was 54.2%. We also found that there is a higher prevalence of gingival recession on the left side of the jaw and in the lower incisors.

Conclusions: Although further studies are needed and a more representative sample should be studied, we conclude that the majority of the analyzed sample have correct oral health behaviors, however, some need to be modified as the understanding of the need to change certain habits to prevent gingival recession development.

Background

The gingival recession or marginal tissue recession is a very common medical condition and undesired, defined as the insertion loss that results in migration of the free marginal gingiva from any tooth surface in the apical direction in relation to the cement-enamel junction (CEJ), which is concomitant with root exposure to the oral environment. (1-7) Clinically, a gingival recession may not be easily detectable because it can be presented in a tooth with, for example, a restoration, a carious lesion or even under dental plaque and calculus, being needed to estimate its location. (1-3)

There are several studies that determine the prevalence, the length (number of teeth affected by the recession) and severity (the amount exposed root) of the recession. (3) Kassab and Cohen state that “more than 50% of the population has one or more local gingival recession of 1 mm or more”, and Susin et al. also confirms these results. (7-10)

In 2004, Marini et al. proposed to assess 380 subjects randomly selected for over 20 years. The author found that 38% of the evaluated teeth had gingival recession and more than 40% of individuals who were older than 50 years had at least one tooth affected with this condition. (3)

Apart from the study, Marini et al. enumerates various studies conducted in different countries stating “gingival recession in the U.S. has been reported in 78-100% of the population with middle age affecting 22-53% of your teeth.” (3)

A few decades after the study listed by Marini et al., in 1999, Albander and Kingman developed another U.S. study in which 58% of the population aged between 30 and 90 years had gingival recessions of at least 1mm. (1-5)

Oliver, Brown and Løe, also evaluated a population in the U.S., grouping it by age ranges. Thus, up to 18 years of age, 15% of the population had recessions with 3mm or more, 18 to 24 years, the prevalence increased to 20% and in individuals over 65 years, the prevalence over 45%. (5)

Furlan et al. claim that in their study, “about 76% of the participants studied showed gingival recession”, 20.7% of the 4872 teeth examined evidenced gingival recession, and 3.92% hyper-sensitivity. (11)

Other studies from different parts of the world present differ-

ent results. A study developed in Norway confirms that 51% of the population over 18 years old had gingival recession. Another study in New Guinea confirms that between 11 and 40% present of the population presents gingival recessions, while a study performed in Finland demonstrates that about 68% of the population is affected by the oral condition. (3)

Epidemiological studies on the prevalence of gingival recession in the population in Tanzania have shown that this varies between 13 and 72% both in the sample as a young elder and that these high numbers are also accompanied by high values of plaque (99.6%) and dental calculus (75-100%) due to the low level of oral hygiene. (12)

Some studies present the first maxillary molars and mandibular central incisors as teeth most often affected while others have canines, both above and below and the premolars, mainly in young people, as those who have more prevalence of gingival recession. (1)

It presented a strong association between the presence of calculi supra and infra-gingival and the presence of gingival recession on the lingual surface of the mandibular incisors. (10)

Another study links a prevalence of 40% in patients 16 to 25 years old in labial teeth and the prevalence increases to 80% if the ages are from 36 to 86 years. (4)

Other studies have used more specific areas such as military sample, with a prevalence of 75% recession, or institutionalized elderly which value was 90% (1)

Materials and Methods

This study was designed as an observational cross-sectional epidemiological study. We obtained a sample of 101 individuals who respected the criteria for inclusion in the sample, which were:

- Patients who have a dental appointment at the University Clinic of UCP-Viseu, Portugal;
- Patients with age between 20 and 30 years old;
- Patients with permanent teeth disregarding the presence or absence of third permanent molars;
- Patients who have at least 20 teeth in the oral cavity because otherwise, the small number of teeth could directly interfere with the results of this study;
- Patients without fixed orthodontic appliances.

At the beginning, the patients were informed of the intention of the study and signed the Informed Consent. Then proceeded to the interview. Finally, patients were subjected to an intraoral exam to obtain data on the O'Leary Plaque Index and Gingival Recession Index and, consequently, the observer filled the data on the record sheet.

For intraoral examination we used gloves and mask for individual protection, paper napkins, intraoral mirror, periodontal probe (recommended by the World Health Organization), bib and bib holder, air / water syringe, microbrush, dental plaque revealer (red erythrosine), contra-angle, polishing brush and polishing paste.

To determine the O'Leary index percentage the plaque revealer (erythrosine) was applied in all dental surfaces in order to determine the value of the O'Leary Plaque Index.

Then, during the intraoral examination, the observer calculated the values of the existing gingival recessions using the Smith classification, since it is the most widely used system of classification for statistical studies. The classification scheme presented by Smith to the vertical extent of gum recession is shown in Tables 1.

Score	Criteria
0	No clinical evidence of root exposure
1	No clinical exposure of root exposure but a subjective awareness of dentinal hypersensitivity is reported, and/or there is clinically detectable exposure of the CEJ not extending more than 1 millimeter vertically to the gingival margin
2-8	Root exposure 2 to 8 mm extending vertically from the CEJ to the base of the soft-tissue defect
9	Root exposure more than 8 mm from the CEJ to the base of the soft-tissue defect
*	An asterisk is affixed to the second digit whenever the vertical component of the soft-tissue defect encroaches in the mucogingival junction or extends beyond it into alveolar mucosa. The absence of an asterisk implies either absence of mucogingival junction involvement at the indexed site or its non-involvement in the soft-tissue defect

Table 1. Smith Classification for vertical extension (1997).

We used the Statistical Package for Social Sciences (SPSS 20.0 Mac OS®) in order to process and analyze the data collected from all variables. Through SPSS 20.0®, the continuous variables were described using measures of central tendency (mean) and measures of dispersion (standard deviation). We calculated prevalences that were expressed in percentages. To compare the proportions we used the Chi-square Test.

Results

In this study, the sample used consisted of 101 subjects, 47 individuals (46.5%) belonging to the male gender and 54 (53.5%) to the female gender. The prevalence of gingival recession was 85.1% and for age, we obtained the average of 23.11 ± 2.23 years, with a minimum age of 20 years and maximum of 29 years.

N	Percentage (%)		
At least one recession ≥ 3mm	Positive	25	24,8%
	Negative	76	75,2%
Total		101	100,0%

Table 2: Prevalence of gingival recessions ≥ 3mm in patients with recession.

Table 2 shows the prevalence of gingival recession equal or higher than 3 mm in patients with gingival recession, in which 24.8% had recessions with values equal or higher than 3 mm and 75.2% presented recessions lower than 3mm.

The prevalence of teeth with gingival recession on the buccal surface and on the lingual / palatal surface in the sample is found, respectively, in Table 3 and 4.

In Table 3, it appears that in patients who had gingival recession, only 2.3% had no recessions in the buccal surface, and the majority (55.8%) had 1-3 teeth with buccal recession.

	N	Percentage (%)
Teeth with recession in the buccal surface in the sample with recessions	0 teeth	2,3%
	1-3 teeth	55,8%
	4-6 teeth	16,3%
	≥7 teeth	25,6%
Total	86	100,0%

Table 3: Prevalence of the number of teeth with recession on the buccal surface in the sample with recessions.

In Table 4, it appears that in patients with recessions, the majority (55.8%) had no recession on the lingual / palatal surface.

	N	Percentage (%)
Teeth with recession in lingual / palatal surface in the sample with recessions	0 teeth	55,8%
	1-3 teeth	18,6%
	4-6 teeth	23,3%
	≥7 teeth	2,3%
Total	86	100,0%

Table 4: Prevalence of the number of teeth with recession on lingual / palatal surface in the sample with recessions.

The prevalence of the number of teeth with recession on each side of the mandible and the maxilla is described in Table 5, 6, 7 and 8.

In Table 5, we see that, in patients with gingival recession, 46.5% had recessions in 1-3 teeth on the left side of the maxilla and 43% did not have any recession on that side.

	N	Percentage (%)
Number of teeth with recession in the left maxilla in the sample with gingival recession	0 teeth	43,0%
	1-3 teeth	46,5%
	4-6 teeth	10,5%
Total	86	100,0%

Table 5: Prevalence of the number of teeth with recession in the left maxilla in the sample with recessions.

In Table 6, we observed that, in patients with recessions, the majority (47.7%) had no recession on the right side of the maxilla and 44.2% has 1-3 teeth affected on that side.

	N	Percentage (%)
Number of teeth with recession on the right maxilla in the sample with recession	0 teeth	47,7%
	1-3 teeth	44,2%
	4-6 teeth	8,1%
Total	86	100,0%

Table 6: Prevalence of the number of teeth with recession in the right maxilla in the sample with recessions.

In Table 7, it appears that, in patients with recession, the majority (65.1%) present recession in 1-3 teeth on the left side of the mandible and 22.1% show no recession on the same side.

	N	Percentage (%)
Number of teeth on the left mandible with recession in the sample with gingival recession	0 teeth	22,1%
	1-3 teeth	65,1%
	4-6 teeth	10,5%
	≥7 teeth	2,3%
Total	86	100,0%

Table 7: Prevalence of the number of teeth with recession in

the left mandible in the sample with recessions.

In Table 8, in patients with gingival recession, while 27.9% had no recession on the right side of the mandible, 58.1% had recessions in that side in 1-3 teeth.

		N	Percentage (%)
Number of teeth with recession in the right mandible in the sample with gingival recession	0 teeth	24	27,9%
	1-3 teeth	50	58,1%
	4-6 teeth	10	11,6%
	≥7 teeth	2	2,3%
Total		86	100,0%

Table 8: Prevalence of the number of teeth with recession in the right side of the mandibula with recessions.

Table 9 shows the maxilla and which side is more affected by this condition while table 10 presents the teeth group mostly affected.

In Table 9, it is observed that, in patients with gingival recession, 44.2% have the left mandible most affected with gingival recessions, 22.1% have the right mandible most affected, 20.9% have the left side of the maxilla most affected and 12.8% have the right maxilla most affected.

		N	Percentage (%)
Maxillar and the more affected side	Right Maxilla	11	12,8%
	Left Maxilla	18	20,9%
	Right Mandible	19	22,1%
	Left Mandible	38	44,2%
Total		86	100,0%

Table 9: Prevalence of the the most affected side and which maxilar.

In Table 10 we observe that the teeth group most affected was the mandibular incisors in 24.4% of the cases, followed by the lower premolars in 14.0% of the cases, the upper canines, the upper molars and lower canines with 11.6% of cases each, 10.5% of cases contained the lower molars as the most affected and finally the smallest group consisted of the upper incisor; with only 5.8% of cases.

		N	Percentage (%)
Most affected teeth group	Upper Incisives	5	5,8%
	Upper Canines	10	11,6%
	Upper Pre-molares	9	10,5%
	Upper molares	10	11,6%
	Lower Incisives	21	24,4%
	Lower Canines	10	11,6%
	Lower Pre-molares	12	14,0%
	Lower Molares	9	10,5%
Total		86	100,0%

Table 10: Prevalence of the most affected teeth group.

In Table 11, it was found that 48.8% of the cases were localized recessions and 51.2% were generalized recessions.

N	Percentage (%)		
Gingival Recession type	Localized	42	48,8%
	Generalized	44	51,2%
Total		86	100,0%

Table 11: Prevalence of the gingival recession type.

Discussion

In this study we found that about 85% of the sample had at least one gingival recession, which is a much higher value than found in other studies as, for example, the study developed by *Marini et al.* (64%), *Furlan et al.* (15.21%) and *Slutzkey et al.* (30%),(3,7,11)

From the sample that had at least one gingival recession, 75.2% have their highest recessions under 3 mm which agrees with the data from the study of *Marini et al* (70%), however we can verify that, despite the high prevalence of gingival recession of the sample, with an increase in the severity and its extension, there is also a decrease in the prevalence.(1)

Another relevant fact is that 81.4% of patients with gingival recession presented them in a localized form which goes against what *Slutzkey et al.* defend in their study. (7)

In this study there was a higher prevalence of gingival recession on the buccal surface of the teeth (97.7%) rather than on the lingual/palatine surface (44.2 %) which is consistent with several studies. (5,6,13-16)

When analyzing if the higher presence of gingival recessions was in the upper maxilla or in the mandible, the results are similar to those described in the study of *Tezel et al.*, which there was more recessions in the mandibular teeth, specifically in the left side (44.2%), probably due to the fact that most patients were right-handed and apply more force in the lower teeth brushing than in the upper teeth. (5,6,13-16)

Tezel et al. stated that the teeth “most affected were the maxillary premolars followed by maxillary canines” while *Stoner et al.* argued that the lower incisors were the most affected by the development of gingival recessions. In the present study, we determined that the teeth group most affected were the mandibular incisors (24.4%) followed by premolars (14.0%) which goes, in part, against the results presented by *Stoner et al.* (5)

Although a larger sample is needed for future studies, this study presents an enormous preventive potential in the clinical practice, not only for the medical field of Periodontology, but even in all the fields of dental medicine.

Epidemiological studies with this objective allows the dentist to be more aware of the reasons why certain gingival recessions develop and are mostly present in certain locations, enabling the development of better treatment plans for their patients.

Conclusions

Few studies exist regarding the prevalence of gingival recessions in the Portuguese population and about its prevalence in the oral cavity.

The location, severity and extension of gingival recession may indicate to the dentist its etiological cause, even allowing a fundamental preventive intervention permitting the dentist to obtain better results.

Thus, due to the clinical importance of this condition, both in treatment and in designing a treatment plan, this study is a tool of enormous importance for future studies in the field of Periodontology, Preventive Dentistry and other dental medicine fields.

REFERENCE

1. Tugnait A, Clerehugh V. Gingival recession - its significance and management. *J Dent*. 2001 Aug; 29(6):381-94. | 2. Chrysanthakopoulos NA. Aetiology and severity of gingival recession in an adult population sample in Greece. *Dent Res J*. 2011 Jan; 8(2):64-70. | 3. Marini MG, Greggi SLA, Passanezi E, Sant'ana ACP. Gingival recession: prevalence, extension and severity in adults. *J Appl Oral Sci*. 2004 Sep; 12(3):250-5. | 4. Kassab M, Cohen R. The etiology and prevalence of gingival recession. *J Am Dent Assoc*. 2003 Feb; 134(2):220-5. | 5. Yared K, Zenobio E. A etiologia multifatorial da recessão periodontal. *Rev Dent Press Ortod e Ortop Facial*. 2006; 11(5):45-51. | 6. Lafzi A, Abolfazli N. Assessment of the etiologic factors of gingival recession in a group of patients in Northwest Iran. *J Dent Res Dent Clin Dent Prospects*. 2010; 3(3):3-6. | 7. Slutzkey S, Levin L. Gingival recession in young adults: occurrence, severity, and relationship to past orthodontic treatment and oral piercing. *Am J Orthod Dentofac Orthop*. 2008 Dec; 134(5):652-6. | 8. Ravishankar Y, Srinivas K, Sharma S. Management of black triangles and gingival recession: a prosthetic approach. *Indian J Dent Sci*. 2012; 4(1):141-5. | 9. Mahajan A. Mahajan's modification of the miller's classification for gingival recession. *Dent Hypotheses*. 2010 Aug; 1(2):45-50. | 10. Alghamdi H, Babay N, Sukumaran A. Surgical management of gingival recession: A clinical update. *Saudi Dent J King Saud University*; 2009 Jul; 21(2):83-94. | 11. Furlan L, Sallum A, Sallum E, Junior F. Incidência de recessão gengival e hipersensibilidade dentinária na clínica de graduação da FOP-UNICAMP. *Rev. periodontia*. 2007; 17(1):53-61. | 12. Mumghamba EGS, Honkala S, Honkala E, Manji KP. Gingival recession, oral hygiene and associated factors among Tanzanian women. *East Afr Med J*. 2009 Mar; 86(3):125-32. | 13. Dörfer CE, Joerss D. A prospective clinical study to evaluate the effect of manual and power toothbrushes on pre-existing gingival recessions. *J Contemp Dent Pract*. 2009; 10(4):1-12. | 14. Rajapakse PS, McCracken GI, Gwynnett E, Steen ND, Guentsch A, Heasman P a. Does tooth brushing influence the development and progression of non-inflammatory gingival recession? A systematic review. *J Clin Periodontol*. 2007 Dec; 34(12):1046-61. | 15. Rajapakse P, McCracken G, Gwynnett E, Steen ND, Guentsch A, Heasman PA. Does tooth brushing influence the development and progression of non-inflammatory gingival recession? A systematic review. *J Clin Periodontol*. 2007 Dec; 34(12):1046-61. | 16. Tezel A, Çanakçı V, Çiçek Y, Demir T. Evaluation of gingival recession in left-and right-handed adults. *Int J Neurosci*. 2001; 110:135-46. |