

Oral granuloma gravidarum: a retrospective study of 41 cases in Southern Brazil

Juliana Andrade CARDOSO¹, Juliana Cassol SPANEMBERG¹, Karen CHERUBINI², Maria Antonia Zancanaro de FIGUEIREDO², Fernanda Gonçalves SALUM³

1- MSc, Oral Medicine Division, São Lucas Hospital, Pontifical Catholic University of Rio Grande do Sul (PUCRS), Porto Alegre, RS, Brazil.

2- PhD, Professor, School of Dentistry, Oral Medicine Division, São Lucas Hospital, Pontifical Catholic University of Rio Grande do Sul (PUCRS), Porto Alegre, RS, Brazil.

3- PhD, Senior Lecturer, School of Dentistry, Oral Medicine Division, São Lucas Hospital, Pontifical Catholic University of Rio Grande do Sul (PUCRS), Porto Alegre, RS, Brazil.

Corresponding address: Fernanda Gonçalves Salum - Hospital São Lucas - PUCRS - Av. Ipiranga, 6690 - Sala 231 - 2º andar - 90610-000 - Porto Alegre - RS - Brazil - Phone/Fax: +55 51 3320-3254 - e-mail: fernanda.salum@pucrs.br

Received: January 7, 2013 - Modification: April 1, 2013 - Accepted: April 12, 2013

ABSTRACT

Granuloma gravidarum (GG) is an inflammatory lesion, which develops in the oral mucosa of pregnant women in response to chronic low-grade irritants, under the influence of hormonal factors. Objective: To characterize GG clinically by means of a retrospective study of the cases of the Oral Medicine Division, São Lucas Hospital, Brazil. Material and Methods: Cases of GG diagnosed between 1980 and 2012 were analyzed. Data were obtained referring to the age of the patients, lesion location, clinical features, as well as the presence of local irritants. The gestation period in which the lesion developed was also investigated. Results: Forty-one cases of GG were found. The lesions developed predominantly in the third trimester of pregnancy (51.22%) and the mean age of the patients was 28 years. Most GG was found in the gingiva (73.17%), was reddish color and had a mean diameter of 1.5 cm. Local irritants were involved in 75.6% of the cases. Conclusions: The hormonal conditions of pregnancy can have an impact on the oral cavity, predisposing the patient to inflammatory lesions such as GG.

Key words: Epidemiology. Pregnancy. Granuloma gravidarum. Pyogenic granuloma.

INTRODUCTION

Granuloma gravidarum (GG) is an inflammatory lesion, which develops in the oral mucosa of pregnant women in response to chronic irritants of low degree such as bacterial biofilm, dental calculus and traumatic agents. Increased concentrations of estrogen and progesterone raises the levels of *Prevotella intermedia* in the subgingival biofilm, diminishes the host response to bacterial biofilm, increases vascular permeability, favors the infiltration of fluids into the perivascular tissues and enhances the inflammatory response, having an important role in the development of the lesion¹⁰.

From the histopathological point of view, there are no differences between GG and pyogenic granuloma. There is a variation in the nomenclature of lesions based on their occurrence in the gestation period^{4,13}. The lesions are composed of

highly proliferative vascular tissue, with numerous channels bordered by endothelium, which can appear obliterated by erythrocytes. There is inflammatory infiltrate mixed with neutrophils, plasmocytes and lymphocytes¹.

The need for surgical intervention during pregnancy should be carefully examined, considering the high rate of GG recurrence, as well as the possibility of regression after childbirth, due to the normalization of hormonal levels¹⁵. In general, treatment during pregnancy is necessary if the lesion causes functional or aesthetic harm. On the other hand, its surgical excision is indicated after pregnancy². The control of the bacterial biofilm is of great importance to prevent recurrence after treatment^{5,7}.

The aim of this study was to characterize GG, by means of an epidemiological survey of cases diagnosed over a period of 32 years, in the Oral Medicine Division, São Lucas Hospital – Pontifical

Catholic University of Rio Grande do Sul (PUCRS), Brazil.

METHODS

A total of 206 medical records of female patients with pyogenic granuloma, diagnosed from 1980 to 2012, were selected in the Oral Medicine Division, São Lucas Hospital – Pontifical Catholic University of Rio Grande do Sul (PUCRS), Brazil. The cases were reviewed to determine if the lesion developed during pregnancy, which characterizes GG. The histological slides were reviewed by a pathologist to confirm the anatomopathological diagnosis.

The following information was obtained from the selected medical records: age of patients, location, size, coloration and type of lesion insertion, as well as the presence of ulceration, bleeding and local irritants (bacterial biofilm, dental calculus, gingivitis or trauma). The gestation period in which the lesion occurred, its time of development and treatment were also examined.

Statistical analysis

The data were initially evaluated by descriptive statistics. The qualitative variables were expressed as absolute and relative frequencies. The quantitative variables were described by mean and standard deviation.

Comparison of the results for age groups, gestation period and lesion size was carried out by constructing contingency tables and applying the chi-square test. Due to the small sample size, the significance of the test was obtained via simulation using the Monte Carlo method. The software used was the SPSS version 17.0.

RESULTS

Forty-one cases of GG were found in patients aged 19 to 44 years, with a mean of 28 years ($SD \pm 6.45$). In 51.22% of the cases, the lesion had developed in the third trimester of pregnancy, in 24.39% in the second trimester and in 17.07% in the first trimester. This information was not available in the medical records of 7.32% of the patients.

The most prevalent location of GG was the gingiva, corresponding to 73.17% of the cases, with no statistically significant difference between the upper and lower region. The other affected sites were the tongue (14.63%), lip (7.32%), palate and buccal mucosa (4.88%). The lesions appeared as nodules with diameters of 0.5 to 3.5 cm with a mean of 1.46 cm ($SD \pm 0.89$). Reddish coloration was observed in 92.68% of the cases, an ulcerated surface was present in 31.71%, and the occurrence of bleeding, spontaneous or upon touch, occurred

in 48.78% of the GG cases. Pedunculated base was observed in 60.98% of the cases, while in the other cases, the lesions were sessile (Figures 1 and 2).

The mean time of development was 168 days, but most lesions (65.85%) had up to 3 months of duration. Local irritant factors were reported in 75.61% of the cases. The irritants described in the medical records were bacterial biofilm (29.27%), gingivitis (21.95%), calculus (12.20%) and trauma (12.20%). These characteristics are described in Figure 3.

Regarding treatment, 82.93% of the lesions were surgically excised. In 41.18% of the cases, the excision was performed a few weeks or months after childbirth and in 58.82% of the cases, it was performed during pregnancy. After the removal of local irritants, three lesions (7.32%) had spontaneous remission, two of them during pregnancy. In 9.75% of the cases, patients did not return, so there was no information about their treatment.

There was a significant association between age and gestation period since the pregnant women up to 25 years old showed a tendency to develop GG



Figure 1- GG on lip associated with trauma by orthodontic appliance



Figure 2- GG with ulceration in gingiva

GRANULOMA GRAVIDARUM			
		N	%
Age of patients	Up to 25 years	15	36.59%
	26 to 35 years	20	48.78%
	≥36 years	6	14.63%
Time of development	Up to 3 months	27	65.85%
	4 to 6 months	7	17.07%
	7 to 9 months	1	02.44%
	More than 10 months	6	14.63%
Location	Tongue	6	14.63%
	Lip	3	07.32%
	Gingiva	30	73.17%
	Others	2	04.88%
Size	Up to 1 cm	20	48.78%
	1 to 2 cm	13	31.71%
	>2 cm	8	19.51%
Coloration	Reddish	38	92.68%
	Pinkish	3	07.32%
Base	Pedunculated	25	60.98%
	Sessile	16	39.02%
Presence of ulcer		13	31.71%
Presence of bleeding		20	48.78%
Local irritants	Bacterial biofilm	12	29.27%
	Gingivitis	9	21.95%
	Dental calculus	5	12.20%
	Trauma	5	12.20%
	None or not known	10	24.39%
Gestation period	1 st Trimester	7	17.07%
	2 nd Trimester	10	24.39%
	3 rd Trimester	21	51.22%
	Not known	3	07.32%
TOTAL CASES		41	

Figure 3- Age of patients with GG, localization, clinical characteristics of lesions, predisposing factors and gestation period when lesions developed

in the first trimester of pregnancy (50%, $p=0.057$). The patients with ages between 26 and 35 years showed the lesion mainly in the third trimester (78.9% $p=0.001$). There was no association between the other clinical parameters evaluated.

DISCUSSION

There are various retrospective studies that have reported on the clinicopathological characteristics of pyogenic granuloma, among which cases of GG are often included. However, a series of cases specifically examining the clinical characteristics of GG are not found in the literature. Thus, the present study aimed to retrospectively review 41 cases of GG diagnosed in the Oral Medicine Division, São Lucas Hospital, Brazil.

GG can start developing during the first trimester

of pregnancy and its incidence increases as of the seventh month¹⁴. These characteristics were demonstrated in the present study, in which the pregnant women up to 25 years old showed a tendency to develop the lesion in the first trimester, but the majority of lesions occurred in the third trimester. The lesions were more prevalent in the third decade of life, where the mean age of the patients was 28 years. These results were similar to those described in the literature regarding pyogenic granuloma^{6,8,16}. This is the first study to date to specifically describe the age of patients with GG.

In the present study, 73.17% of the lesions were located in the gingiva, without a difference between the upper or lower region. According to the literature, the gingiva is the most affected region, and the upper lesions are more prevalent¹². The presence of some predisposing factor was

detected in 75.61% of the cases studied. Bacterial biofilm and dental calculus were the main local irritants associated with GG, explaining the greater involvement of the gingiva by inflammatory lesions. Other sites such as the tongue, lip, palate and buccal mucosa can be affected due to traumatic factors. Thus, the presence of local irritants associated with hormonal factors increases the probability of the development of GG, mainly in the gingiva. During pregnancy, marked inflammatory characteristics are usually observed in the gingiva, with the presence of edema, intense erythema, hyperplasia and an increased tendency of bleeding³. This is due to the capacity of pregnant women to produce large amounts of progesterone and estrogen, which potentiate the vascular response.

Despite of the possibility of regression of GG with the regularization of hormone levels after childbirth¹⁵, in 58.82% of the cases surgical excision was performed during the 2nd trimester. In these cases, surgery was an option of the patients due to the aesthetic harm, bleeding and halitosis caused by the lesions. Moreover, in 41.18% of the cases, even after childbirth, there was no remission and the lesions were also surgically treated.

In this study, the lesions were clinically observed as pedunculated or sessile nodules, usually reddish color, capable or not of bleeding and ulceration. These findings are compatible with those described in the international literature with respect to the clinical appearance of pyogenic granuloma^{7,8,11,12}, and therefore demonstrate that there are no clinical differences between the two lesions⁹. Pregnancy alters female hormonal conditions considerably. These alterations can have repercussions on the oral cavity, predisposing the pregnant woman to periodontal inflammation, where GG is a reactional lesion resulting from this inflammation.

CONCLUSIONS

The hormonal conditions of pregnancy can have an impact on the oral cavity, predisposing the patient to inflammatory lesions such as GG.

CONFLICT OF INTEREST STATEMENT

None.

REFERENCES

- 1- Amirchaghmaghi M, Falaki F, Mohtasham N, Mozafari PM. Extragingival pyogenic granuloma: a case report. *Cases J*. 2008;1(1):371.
- 2- Arias-Santiago S, Aneiros-Fernandez J, Orgaz-Molina J, Fernández-Pugnaire MA, Girón-Prieto MS, Naranjo-Sintes R, et al. A pregnant woman with a nodule on the tongue: a quiz. *Lobular capillary haemangioma (pyogenic granuloma)*. *Acta Derm Venereol*. 2011;91(5):607-8.
- 3- Carrillo-de-Albornoz A, Figuero E, Herrera D, Bascones-Martínez A. Gingival changes during pregnancy: II. Influence of hormonal variations on the subgingival biofilm. *J Clin Periodontol*. 2010;37(3):230-40.
- 4- Daley TD, Nartey NO, Wysocki GP. Pregnancy tumor: an analysis. *Oral Surg Oral Med Oral Pathol*. 1991;72(2):196-9.
- 5- Gondivkar SM, Gadbail A, Chole R. Oral pregnancy tumor. *Contemp Clin Dent*. 2010;1(3):190-2.
- 6- Gordón-Núñez MA, Vasconcelos Carvalho M, Benevenuto TG, Lopes MF, Silva LM, Galvão HC. Oral pyogenic granuloma: a retrospective analysis of 293 cases in Brazilian population. *J Oral Maxillofac Surg*. 2010;68(9):2185-8.
- 7- Jafarzadeh H, Sanatkhan M, Mohtasham N. Oral pyogenic granuloma: a review. *J Oral Sci*. 2006;48(4):167-75.
- 8- Krishnapillai R, Punnoose K, Angadi PV, Koneru A. Oral pyogenic granuloma - a review of 215 cases in a South Indian teaching hospital, Karnataka, over a period of 20 years. *Oral Maxillofac Surg*. 2012;16(3):305-9.
- 9- Markou E, Eleana B, Lazaros T, Antonios K. The influence of sex steroid hormones on the gingiva of women. *Open Dent J*. 2009;3:114-9.
- 10- Mealey BL, Moritz AJ. Hormonal influences: effects of diabetes mellitus and endogenous female sex steroid hormones on the periodontium. *Periodontol* 2000. 2003;32(1):59-81.
- 11- Salum FG, Yurgel LS, Cherubini K, De Figueiredo MA, Medeiros IC, Nicola FS. Pyogenic granuloma, peripheral giant cell granuloma and peripheral ossifying fibroma: retrospective analysis of 138 cases. *Minerva Stomatol*. 2008;57(5):227-32.
- 12- Saravana GH. Oral pyogenic granuloma: a review of 137 cases. *Br J Oral Maxillofac Surg*. 2009;47(4):318-9.
- 13- Silva-Sousa YT, Coelho CM, Brentegani LG, Vieira ML, Oliveira ML. Clinical and histological evaluation of granuloma gravidarum: case report. *Braz Dent J*. 2000;11(2):135-9.
- 14- Silverstein LH, Burton CH Jr, Singh BB. Oral pyogenic granuloma in pregnancy. *Int J Gynaecol Obstet*. 1995;49(3):331-2.
- 15- Torgerson RR, Marnach ML, Bruce AJ, Rogers RS 3rd. Oral and vulvar changes in pregnancy. *Clin Dermatol*. 2006;24(2):122-32.
- 16- Zarei MR, Chamani G, Amanpoor S. Reactive hyperplasia of the oral cavity in Kerman province, Iran: a review of 172 cases. *Br J Oral Maxillofac Surg*. 2007;45(4):288-92.