A 38- Year Demographic Study of Central and Peripheral Giant Cell Granulomas of the Gaws

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Abstract

Objective: The purpose of this study was to retrospectively analyze the demographic characteristics of patients with central peripheral giant cell granulomas (CGCGs) / (PGCGs) an Iranian population.

Methods: In this 38-year retrospective study, the data were obtained from records of 1019 patients with CGCG and PGCG of the jaws referred to the Department of Oral and Maxillofacial, Pathology, Mashhad University of Medical Sciences, Iran between 1972 and 2010. Information regarding age distribution, gender, location of the lesion and clinical signs and symptoms was documented.

Results: A total of 1019 patients were affected by giant cell granuloma lesions (GCGLs) including 435 CGCGs and 584 PGCGs. The mean age was 28.91 ± 18.16. PGCGs and CGCGs had a peak of occurrence in the first and second decade of life respectively. A female predominance was shown in CGCG cases (57.70%), whereas PGCGs were more frequent in males (50.85%). Five hundred and ninety eight cases of all giant cell lesions (58.7 %) occurred in the mandible. Posterior mandible was the most frequent site for both Lesions. The second most common site for PGCG was posterior maxilla (21%), whereas anterior mandible was involved in CGCG (19.45%). The majority of patients were asymptomatic. Patient's age, location (mandible/maxilla) and bleeding were the influential variables on the type of the lesion.

Conclusion: Although the CGCGs share some histopathologic similarities with PGCGs, differences in demographic features may be observed in different populations.

Key words: Giant cell Granuloma, Jaw, Centrals peripheral

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Introduction

Giant cell granuloma lesions (GCGLs) are benign, non-odontogenic, relatively uncommon tumors of the oral cavity, which arise either peripherally within gingiva, or centrally as an intraosseous lesion (1).

The peripheral giant cell granuloma (PGCG) is a reactive exophytic lesion arises in periodontal ligament and mucoperiosteum of the alveolar ridge. It is also known as a giant-cell epulis, giant-cell reparative granuloma, or giant-cell hyperplasia (2). It occurs more frequent in the fifth and sixth decades of life with a slight female predilection (3).

The central giant cell granuloma (CGCG) is a benign intra-osseous proliferative lesion that occurs almost exclusively in the jaws. They comprise fewer than 7% of all benign

tumors of the jaws (4,5). This lesion mainly occurs in children or in young adults, with a female predilection. It is more common in the mandible (3,6).

CGCG and PGCG are virtually identical histologically, being characterized by the presence of osteoclast-like giant cells scattered in a cellular fibro-vascular stroma. However, despite their similarity, distinct clinical behavior is observed for these lesions. CGCGs are benign but may show aggressive behavior with bone destruction, rapid growth, pain, root resorption and tendency to recur after excision, whereas low recurrence rate and rare bone or tooth resorption are seen in PGCGs (7-9).

There is considerable variation in the clinical behavior of CGCG. Rapid onset of pain, parasthesia, root resorption, and tooth displacement may be seen. Sometimes these lesions are asymptomatic (10).

The distribution pattern of giant cell granulomas (GCGs) observed in one country may not be evident in other countries. The clinical and demographic features of these lesions including patient age and sex, location of lesion, and distribution vary with race and geographic location. There is no extensive data concerning clinico-pathologic features of GCGLs in the English-language literature in Iranian population. Only Motamedi *et al.* (3) and Aghbali *et al.* (11) studies have been published.

As GCGs are common lesions in our country, we attempted to evaluate demographic features of patients in an Iranian population.

The purpose of this study was to retrospectively analyze the clinical features of 1019 patients with CGCGs and PGCGs in Iranian population. The findings were compared with the literature in respect of age, gender, location of the lesion and clinical signs and symptoms (pain, swelling and bleeding).

Methods

The data for the retrospective study were obtained from records of 1019 patients with CGCG and PGCG of the jaws referred to the Department of Oral and Maxillofacial, Mashhad University of medical Sciences, Mashhad, Iran between 1972 and 2010. Diagnosis of CGCGs and PGCGS based on histological examination of hematoxylin-and-eosin tissue sections and data in patients records (peripheral /central) which was reconfirmed by two pathologists. This 38-year retrospective study was based on existing data. Clinical data were analyzed, focusing on age, gender, location of the lesions, and clinical signs and symptoms including pain, swelling and bleeding which were available in patients records. For GCG location the following scheme was used. The maxilla and mandible were divided into 6 anatomical regions, 3 on either side: anterior (from the midline to the distal surface of the canine), posterior (from the mesial aspect of the first premolar to the distal side of the third molar) and anterior-posterior (12). The anatomical region of 46 PGCGs and 60 CGCGs were not available. Statistical analysis was performed using SPSS software. For evaluation of influential variables on the type of the lesion (PGCG and CGCG) binary logistic regression model

was performed. The influential variables were evaluated in comparing with the reference groups including age <10, male patient, mandible, existence of swelling and bleeding. Data were considered significant at $P< 0.05$.

Results

A total of 1019 out of 9485 patients (10.7%) were affected by GCGLs during the study (435 CGCGs and 584 PGCGs). Patients ranged in age at the time of diagnosis from 2 to 90 years with a mean age of 28.91 ± 18.16. PGCGs and CGCGs had a peak of occurrence in the first and second decade of life respectively. Table 1 shows distribution of PGCGs and CGCGs in different decades of age with statistically significant difference ($P<0.05$).

Table1- Relative distribution of PGCGs and CGCGs in different decades of age

Age in decades	PGCG	CGCG
0-10	118 (20.20)	75(17.24)
10-20	97 (16.60)	111 (25.51)
20-30	90(15.41)	81 (18.62)
30-40	102 (17.46)	64 (14.71)
40-50	78 (61)	51 (11.72)
50-60	63 (13.35)	32 (7.35)
60-70	17 (2.91)	14 (3.21)
>70	19(3.25)	7(1.6)
Total	584(100)	435 (100)

A female predominance was shown in CGCG cases (57.70%), whereas PGCGs were more frequent in males (50.85%) with statistically significant difference ($P<0.05$).

The distribution in terms of gender in CGCG and PGCG cases are presented in separately Table 2.

Table2- Relative frequency of giant cell granuloma lesions based on sex origin

PGCG	**Female**	287(49.15)
	Male	297(50.85)
	Total	584(100)
CGCG	**Female**	251(57.70)
	Male	184 (42.30)
	Total	435(100)

Five hundred and ninety eight cases of all giant cell lesions (58.7 %) occurred in the mandible and 421 cases (41.3 %) were in maxilla ($P<0.05$). The mandibular and maxillary distribution of PGCGs and CGCGs are demonstrated in Table3.

Table3- Relative frequency of giant cell granuloma lesions based on location

PGCG	**Mandible**	324 (55.5)
	Maxilla	260 (44.5)
	Total	584(100)
CGCG	**Mandible**	274 (63)
	Maxilla	161 (37)
	Total	435 (100)

Posterior mandible was the most frequent site for both CGCG (35.75%) and PGCG (32.70%) cases. The second most common site for PGCG was posterior maxilla (21%), whereas anterior mandible was involved in CGCG (19.45%). PGCGs were distributed equally between the anterior maxilla and mandible. Table4 shows the frequency of studied lesions based on region of jaws without statistically significant differences. The majority of patients were asymptomatic. Bleeding was reported in 31% of PGCGs and 21% of CGCGs ($p<0.05$). Pain

(p=0.626) and swelling (p<0.05) were only observed in 6.08 % and 2.45 % of patients respectively.

Table4- Distribution of anatomical regions for studied lesions in the jaws.

Lesion	Mandible		Maxilla				
	Anterior	Posterior	Anterior	Anterior	Posterior	Anterior-Posterior	Total
PGCG	98 (18.20)	176 (32.70)	28 (5.20)	99 (18.40)	113 (21)	24 (4.5)	538(100)
CGCG	73 (19.45)	134(35.75)	22 (5.85)	65 (17.35)	59 (15.75)	22 (5.85)	375(100)_
P-value		P=0.302			P=0.964		

The influential variables were evaluated in comparing with the reference groups. Age <10, male patient , mandible, existence of swelling as well as of bleeding were respectively considered as the reference groups for evaluation the influence of age, sex, lesion location (mandible/maxilla), swelling and bleeding on the type of the lesion (PGCG or CGCG).

As it is shown in Table 5, the probability of allocating female patients to CGCG group is 1.3 times more than males. The probability of allocating maxilla to CGCG group is 0.73 times more than mandible.

Moreover, the probability of allocating the groups without bleeding and without swelling are 1.57 and 0.48 times more than groups with bleeding and swelling respectively.

According to the binary logistic regression, patient's age, lesion location (mandible/maxilla) and bleeding as the influential variables showed significant effect on the type of the lesion (Table5).

Table5- Influential variables on the type of the lesion (PGCG/ CGCG).

Variables	B	S.E[1]	p	OR[2]	CI[3](95% CIfor OR)	
sex	.259	.142	.069	1.296	.981	1.712
jaw	-.314	.144	.030	.731	.551	.969
swelling	-.723	.497	.146	.485	.183	1.285
bleeding	.451	.161	.005	1.571	1.146	2.152
Age			.019			
<10	.570	.217	.008	1.769	1.157	2.704
10-19	.277	.232	.232	1.320	.837	2.080
20-29	-.026	.233	.910	.974	.617	1.537
30-39	.010	.255	.968	1.010	.613	1.664
40-49	-.194	.287	.500	.824	.469	1.446
50-59	.335	.462	.468	1.399	.566	3.458
60-69	-1.042	.664	.117	.353	.096	1.296
Constant	-.088	.543	.871	.916		

1-Standard Error 2-Odds ratio 3-Confidence interval

Discussion

The present study details the profile of patients diagnosed as having central and peripheral giant cell granulomas referred to the department of oral and maxillofacial, Mashhad University of medical Sciences , Mashhad, Iran between 1972 and 2010. A total 1019 cases were evaluated, and epidemiologic findings were compared with

previous studies. It is important to mention that we evaluated 1019 lesions in a 38-year period, whereas small number of cases considered in previous series (1,6,9,11,13,14).

CGCGs occur more often in patients younger than 30 years of age (9,15,16) . In our study, a peak of occurrence was in the second decade of life, corresponding to the findings of other authors (13). Although it has been shown that PGCGs occur more frequent in the fifth and sixth decades (3) the first decade was the most frequent age in the current study. In some studies patients were aged between four and seven decades, whereas most of our patients with PGCG were under 40 years old (1).

It should be noted that in the current study influential variables on the type of the lesion (PGCG/CGCG) were also evaluated. According to the results, patient's age, lesion location (mandible/maxilla) and bleeding as theinfluential variables showed significant effect on the type of the lesion.

The majority of studies agree that there is a female predominance for CGCG lesions (3,9,13,15,16) which is in agreement with our results. In the present study, PGCGs appeared more common in males, which is in contrast to the proved thesis that describes predilection for female patients (3,9,13,15-17) . Murat *et al* (2004) also reported male predilection (56%) which was slightly higher than our results (18).

A mandible predominance (58.7%) was identified in our series, and is in agreement with other studies (4,9,15,18). We also reported that only upper jaw effects on the type of the lesion including central or peripheral giant cell granuloma.

Similar to our results, previous studies (5, 10,15,19,20), have been stated that molar and premolar areas of mandible were more often affected by CGCGs than the anterior parts. Most of PGCG cases were also in the posterior part of mandible in our study. The second most common site for PGCG was posterior maxilla (21%), whereas anterior mandible was involved in CGCG (19.45%). In contrast to our results Boffano et al showed maxilla as the most frequent site for PGCGs (20).

The clinical features of CGCGs varied considerably and is hard to predict (9).

Bleeding was the most common clinical feature in our cases, whereas Sun et al reported asymmetric swelling of the jaw as the most common clinical aspect in their series (11). Swelling was seen in only 3% of our cases.

Pain was considered to be associated with aggressive behavior of lesions (16) and was the second most frequent clinical aspect in our study. It should be mentioned that bleeding and pain were more common in patients with PGCG than CGCG.

Conclusion

In conclusion, in contrast to most of previous studies PGCGs occur more common in the first decade and also more frequently in male patients. Although the CGCGs share some histopathologic similarities with PGCGs, differences in demographic features may be observed in different populations. Therefore, demographic evaluation of lesions which are more common in our country may help in

the diagnosis and management of these lesions.

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Conflict of Interest: "None Declared"

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