Original article

A 38-year demographic study of central and peripheral giant cell granulomas of the jaws

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Abstract:

Objective: The purpose of this study was to retrospectively analyze the demographic characteristics of patients with central giant cell granulomas (CGCGs) and peripheral giant cell granulomas (PGCGs) in Iranian population. ***Methods***: The data were obtained from records of 1019 patients with CGCG and PGCG of the jaws referred to our department between 1972 and 2010. This 38-year retrospective study was based on existing data. Information regarding age distribution, gender, location of the lesion and clinical signs and symptoms was documented. ***Results***: A total of 1019 patients were affected GCGLs including 435 CGCGs and 584 PGCGs during the study. 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 CGCG and PGCG cases. 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. ***Conclusions***: 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 which may help in the diagnosis and management of these lesions.

Keywords: central giant cell granuloma; peripheral giant cell granuloma

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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 intraosseouslesion [1].

The peripheral giant cell granuloma (PGCG) is a rare 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 intraosseous 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 youngadults, with a female predilection. It is more common in the mandible[3, 6].

CGCG and PGCG are virtually identical histologically, beingcharacterized by the presence of osteoclast-like giant cells scattered in a cellular fibrovascularstroma.However, despitetheir similarity, distinct clinical behavior

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is observed for these lesions.CGCGs are benign aggressivedestructive osteolytic lesionwith rapid growth,pain, root resorptionand 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 ageand sex, location of lesion, and distribution vary with race andgeographic location.There is little information in the English-language literatureabout the clinicopathologic features giant cell granuloma lesionsinIranian population.

The purpose of this study was to retrospectively analyzethe clinical features of 1019 patients with CGCGs and PGCGs in Iranian population. The findings were compared with the literature inrespect 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 our department between 1972 and 2010. 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 includingpain , 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. The anatomical region of 46 PGCGs and 60 CGCGs was not available. Statistical analysis was performed using SPSS software. Data were analyzed by applying $\chi 2$ Test. Data were considered significant at $P < 0.05$.

Results:

A total of 1019 out of 9485 patients (10.7 %) were affected 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 $\pm$ 18.16. PGCGs and CGCGs had a peak of occurrence in the first and second decade of liferespectively.Table 1 shows distribution of PGCGs and CGCGs in different decades of agewith statistically significant difference ($P < 0.05$).

Table 1: Distribution of PGCGs and CGCGs in different decades of age

Age in decades	PGCG (n; relative %)	CGCG (n; relative %)
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 inCGCG and PGCG cases are presented in separately Table 2.

Table 2: Frequency of giant cell granuloma lesions based on sex origin

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

Five hundred and ninety eight cases ofall 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.

Table 3: Frequency of giant cell granuloma lesions based on location

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

Posterior mandible was the most frequent site for both CGCG (35.75%) and PGCG (32.70%) cases.

Table 4: Anatomical regions of studied lesions in the jaws.

Lesion	**Mandible**			**Maxilla**			
	Anterior (n; relative %)	Posterior (n; relative %)	Anterior-Posterior(n; relative %)	Anterior (n; relative %)	Posterior (n; relative %)	Anterior-Posterior(n; relative %)	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-valu	P=0.302			P=0.964			

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 jawswithout statistically significant differences.

The majority of patients were asymptomatic. Bleeding was reported in 31% of PGCGs and 21% of CGCGs. Pain and swelling were only observed in 6.08% and 2.45 % of patients respectively. Table 5 summarizes the clinical data of patients.

Table 5: Clinical data of patients

Lesion	**Pain(n; relative %)**	**Swelling(n; relative %)**	**Bleeding(n; relative %)**
PGCG	34(6)	9 (1.5)	180 (31)
CGCG	28 (6.45)	16 (3.65)	91 (21)
P-value	P=0.626	P<0.05	P<0.05

Discussion:

The present study details the profile of patients diagnosed as having central and peripheral giant cell granulomas between 1972 and2010. A total 1019 cases were evaluated, andepidemiologic 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].

CGCGs occur more often in patients younger than 30 years of age[9,14,15].In our study, a peak of occurrence was in the second decade of life, corresponding to the findings of other authors[11].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].

The majority of studies agree that there is a female predominance for CGCG lesions[3,9,11,14,15]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 de-scribes predilection for female patients[3,9,11,14-16].Murat et al.'s also reported male predilection (56%) which was slightly higher than our results[17].

A mandible predominance (58.7%) was identified in our series, and is in agreement with other studies[4,9,14,17].

Similar to our results, previous studies[4,9,14,18],have been stated that molar and premolarareas 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[19].

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 mostcommon clinical aspect in their series[11]. Swelling was seen in only 3% of our cases (Table5).

Pain was considered to be associated with aggressive behavior of lesions(15)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.

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 which may help in the diagnosis and management of these lesions.

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