Original Article

Inflammatory Jaw Swellings: Review of 1, 276 Cases seen at the University College Hospital, Ibadan

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ABSTRACT

***Introduction*:** Jaw swellings are common presenting cases at oral diagnosis clinics of which inflammatory causes are important. However, these cases are usually under-represented in histologically diagnosed jaw swellings. The aim of this study was to review the clinico-pathologic features of clinically diagnosed cases of inflammatory jaw swellings that presented in our hospital within 10 years.

***Methods*:** Data on age, gender, clinical diagnosis and site distribution were analyzed descriptively using frequencies, ranges and means ± SD. Variables were compared using Chi square and ANOVA tests as appropriate. Level of significance was set at $p < 5\%$.

***Results*:** Inflammatory jaw swellings were seen in 568 males and 708 females, commoner in adults (18 years and above) constituting 82.3%.The mean age of occurrence was 34.2 ± 18.9 years while the peak age of occurrence was 20-29 years. Mandibular swellings constituted 66.7% of the cases while the left side of the mandible was most commonly affected constituting 32.1%. Dentoalveolar abscess was the most commonly diagnosed inflammatory jaw swelling constituting 37.1%, followed by pericoronitis (28.6%). Maxillary swellings were commoner in males while mandibular lesions were commoner in females ($p < 0.001$).

***Conclusions*:** From this review, inflammatory jaw swellings were commoner in females and adults, with dentoalveolar abscess as the most common clinically diagnosed condition.

INTRODUCTION

Jaw swellings may occur in the mandible or maxilla[1]. Although a clear-cut classification of jaw swellings is not presently in use, different classifications have been attempted[1]. One of them is the MIND classification which groups jaw swellings into metabolic, inflammatory, neoplastic and developmental[2]. An additional category is the idiopathic classification for lesions that cannot be included in the four preceding categories[2]. Inflammatory swellings arise as a result of trauma (physical or chemical), infections (mostly bacterial), reactive or immunologic mechanisms[2]. Inflammatory jaw swellings include abscesses, osteomyelitis, fascial space infections, periodontal infections[3]. Abscesses may be classified anatomically into pericoronitis (pericoronal abscesses), periodontal abscess, gingival abscess, and periodontal-endodontic abscess[4]. Jaw swellings of inflammatory origin are considered dental emergencies[5]. They may be life-threatening in some cases if not promptly and adequately managed[6,7].

***Key words*:** jaw swelling, inflammation, dentoalveolar abscess, osteomyelitis

Literature reviews on inflammatory jaw swellings are not readily available probably because of the multifactorial nature of the aetiology of these swellings. Thus with this review, it is hoped that we will provide a description of inflammatory jaw swellings in our hospital during a ten-year period (2007-2017), and add to the present knowledge base of jaw swellings locally and internationally.

MATERIALS AND METHODS

Case note records of all diagnosed cases of jaw swellings seen at the department of Oral pathology, University College Hospital between January 2007 and June 2017 were retrieved, coded and entered into SPSS version 20. All cases clinically diagnosed as inflammatory jaw swellings were included. Jaw swellings were broadly grouped by location as mandibular, maxillary, and mandibular and maxillary swellings. The swellings were also categorized as dentoalveolar abscess, pericoronitis, ludwig's angina, cellulitis, osteomyelitis, palatal abscess, gingival abscess, infected periapical cyst, periapical abscess, periodontal abscess, submandibular abscess, submasseteric abscess, multiple fascial abscess. Data on prevalence, age, gender, and location were descriptively analysed for each jaw swelling categorization. Data are presented as mean +/- standard deviation, percentages and frequencies where applicable. Patients who were less than 16 years of age were regarded as children.

RESULTS

A total of 1,276 inflammatory jaw swellings were recorded in the study period that spanned 10 years. Inflammatory jaw swellings were more in females than males with a male: female ratio of 1:1.3. The overall mean age was 34.2 ± 18.9 years while the peak age of occurrence was 20-29 years with a range of 1-91 years (Figure 1).

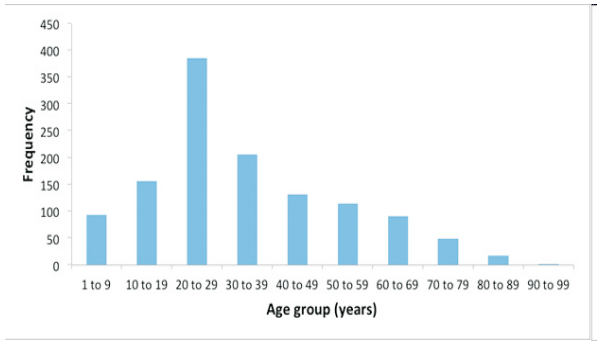

Figure 1: Age group distribution of inflammatory jaw swellings

Most jaw swellings were located in the mandible (66.7%) with left side of the mandible being the most commonly affected site (32.1%) (Figures 2 and 3).

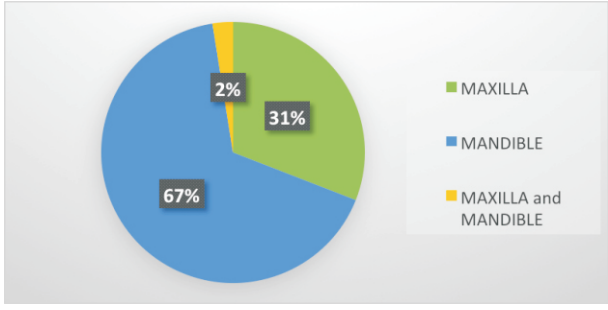

Figure 2: Site distribution of inflammatory jaw swellings

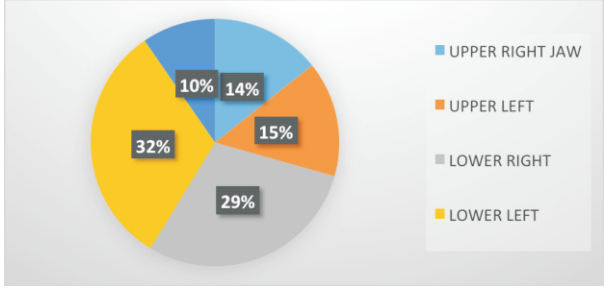

Figure 3: Quadrant distribution of inflammatory jaw swellings

The most common cause of inflammatory jaw swelling was dentoalveolar abscess (37.1%), followed by pericoronitis (28.6%) (Table 1).

Table 1: Distribution of inflammatory jaw swellings based on causes, age, gender and site

Etiology	Pediatric: Adult	Male: Female	Maxilla: Mandible	Total
Dento-alveolar abscess	102: 375	226: 248	177: 296 *	474
Pericoronitis	10: 355	132: 233	13: 351 *	365
Ludwig's angina	0: 16	10: 6	0: 16	16
Cellulitis	6: 29	8: 27	19: 11 *	35
Osteomyelitis	3: 10	5: 8	1: 12	13
Palatal abscess	0: 14	6: 8	14: 0	14
Gingival abscess	1: 9	2: 8	5: 4 *	10
Infected periapical cyst	1: 11	8: 4	7: 5	12
Periapical abscess	32: 112	75: 69	101: 41 *	144
Periodontal abscess	13: 132	73: 72	57: 85 *	145
Submandibular abscess	1: 17	11: 17	0: 18	18
Submasseteric abscess	1: 18	6: 13	0: 18 *	19
Multiple space infection	0: 11	6: 5	1: 3 *	11

Note: * included cases that involved both mandible and maxilla

Mandibular swellings were commoner in females while maxillary swellings were commoner in males (Figure 4).

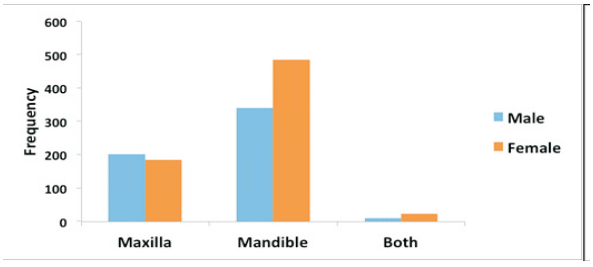

Figure 4: Site distribution of inflammatory jaw swellings based on gender

DISCUSSION

Jaw swellings occur following metabolic, inflammatory, neoplastic or developmental causes . The causes of inflammatory jaw swellings in our study were dentoalveolar abscess, pericoronitis, periodontal abscess, periapical abscess, osteomyelitis, ludwig's angina, multiple space infections and gingival abscess. Out of the 1276 cases of inflammatory jaw swellings seen in this study, females had more inflammatory jaw swellings when compared with males (1.3:1). Amongst the females, dentoalveolar abscess formed the most prevalent lesion. Another study reported that males had more inflammatory swellings than females with a reported percentage of 50.9% . Folayan et al. however reported more cases of pericoronitis amongst the female gender (51.9%) . It has been documented that females have an increased sensitivity to oral health problems because of the unique hormonal changes they experience. These hormonal changes affect the blood supply to the gingiva and the body's response to toxins resulting from plaque buildup. As a result, females are more prone to developing periodontal disease and this may progress to pericoronitis or abscesses.

In a study by Lasisi et al., it was noted that males had more jaw swellings than females (1.1:1), however, the aetiology of these swellings were not individually analysed . Odai et al., however, reported a female predilection of jaw swellings . We suggest that when documenting jaw swellings in relation to whatever index, it may be more useful to do this with reference to the aetiology of such swellings. This is the only way such documentations can have relevance for clinical treatment planning and for influencing policy regarding management of specified jaw swellings.

The mean age of occurrence of inflammatory jaw swelling in this present study was 34.27 ± 18.9 years (fourth decade) which is in keeping with another study on jaw swellings with a mean age of 32.36 ± 17.14 years . Becconsall-Ryan et al. reported a mean age of 44 years amongst patients with inflammatory maxillofacial swellings . The peak age group of occurrence of inflammatory jaw swelling in this study was 20-29 years which was the same peak age group reported by Moloney et al. and Akinyamoju et al. . The reason why inflammatory jaw swellings occurs more in adults than children may be because

there is a higher caries incidence adults compared to children and because untreated tooth decay, which is the most prevalent cause of inflammatory jaw lesions, is declining in children but increasing in adults .

The most common cause of inflammatory jaw swelling in the present study is dentoalveolar abscess (37.1%), followed by pericoronitis (28.6%). The most common cause of dentoalveolar abscess is dental caries and dental caries has been shown to be more prevalent in females . This is due to a faulty amelogenin gene which results in a deficient enamel matrix, reduced salivary flow rate, reduced buffering effect of saliva, more access to food, and earlier tooth-eruption time . Similarly, the finding of pericoronitis as the next most common cause of inflammatory jaw swelling in our study could also be attributed to the higher prevalence of inflammatory jaw swellings in females. The most common cause of pericoronitis is impacted third molars and third molar impaction has been shown to be more prevalent in females . Studies have reported that females suffer more from third molar impaction as they have smaller mandibles when compared to males .

The next common inflammatory jaw swellings seen in this study were periodontal abscesses (11.4%) and periapical abscesses (11.3%). This is in agreement with a study by Patel et al. (4) who reported that periodontal abscesses was the third most common dental emergency with a prevalence of 14%, which is slightly higher than the result from our study. In the present study, osteomyelitis was seen in 13 cases with a male to female ratio of 1.6:1. A previous study however, reported an almost equal gender distribution .

The mandible (specifically the lower left quadrant) was the location for majority of the inflammatory jaw swellings in our study. However, the left mandible was the common location after the anterior maxilla in another study . The quadrant most affected may be related to the dominant quadrant of use, but we did not test to correlate this. A study conducted to test for the dominant side for chewing found that females believed they chewed more on one side than the other, whereas men chewed on both sides equally .

The higher prevalence of inflammatory jaw swelling involving the mandible compared to the maxilla may be due to differences in bone density, vascularity and gravity assisted stasis of food materials leading to caries. Several studies have documented that the posterior mandible is the most common site for maxillofacial swellings generally . Some other studies reported the maxilla as the most common location of inflammatory jaw lesions . This may be because the most prevalent lesions in their studies were periapical lesions, which have a predilection for the maxilla although these may not present clinically as swellings.

In conclusion, we found that inflammatory jaw swellings were commonly seen more in the mandible and in females. The most common cause for these swelling was dentoalveolar abscess.

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