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Evaluation of Factors Associated with Occurance of Third Molar Pericoronitis: A Clinico-Radiographic Study

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Abstract

Introduction: Pericoronitis refers to inflammation of the gingiva in relation to the crown of a partially erupted tooth. It mostly affects third molars. It may be acute, subacute or chronic.

Aims: To study the association of angular position of third molar and to evaluate predisposing factors associated with occurrence of pericoronitis in third molars.

Materials and Methods: The sample consisted of 92 patients with 110 sites affected by pericoronitis. Clinico-radiographic examination was carried out. Clinical findings consisted of age, sex, amount of eruption, predisposing factors signs and symptoms. Radiographic examination was done to assess angular position using Winter's classification.

Statistical Analysis: By using Descriptive statistical analysis, findings were summarized using numbers and percentages,

Results: The peak age of occurrence of third molar pericoronitis was 23-28 years with female predominance. Mandibular molars were involved more commonly. Vertical positioned and partially erupted third molars were most commonly affected by pericoronitis in both arches. Upper respiratory tract infection was most frequently associated predisposing factor with periocoronitis.

Conclusion: Vertically positioned partially erupted third molars are more likely to be affected by from pericoronitis. Considering high risk, early treatment should be rendered.

Keywords: *pericoronitis, third molar, angulation, impaction*

Introduction

A pathological condition in which tooth can not erupt to its normal functional position is called tooth impaction. Third molars most commonly affected teeth by impaction.[1] studies have shown that 9.5 to 39% of mandibular third molars fail to erupt in the oral cavity.[2] Restricted skeletal growth, lack of space, increased crown size and late maturation of third molar are proposed etiological factors for it.[3] Sometimes, impacted wisdom tooth may remain asymptomatic for lifetime, But it may give rise to pathological conditions like pericoronitis, root resorption or distal caries of adjacent teeth, bone resorption, development

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of cyst or tumour.[4]

Pericoronitis is the inflammation of operculum in relation to the crown of a partially erupted, slowly erupting or impacted tooth. The pericoronitis may be acute, subacute or chronic.[5] Acute form afflicting approximately 10% of third molar, is most common reason for its extraction.[6] According to the study done by McArdle et al, out of 1431, 49% of mandibular third molar indicated for extraction due to pericoronitis which was highest among all other causes evaluated.[7]

The acute form is charecterised by severe pain, sometimes refers to adjacent area, swelling of pericoronal tissues, trismus, regional lymphoadenopathy, pus discharge, fever, pain on swallowing. Subacute form is manifested as pain, jaw stiffness, dysphagia, intraoral swelling and pus discharge in the absence of extraoral swelling. In chronic form, there is mild discomfort or dull pain lasting from one or two days with remissions for many months.[5,9]

Sometimes infection may spread to facial planes and involve vestibular, buccal, submassetric, submental, submandibular and pterygoid spaces. These spaces are communicated with infratemporal, temporal, and parapharyngeal spaces and deep aspects of head, neck and mediastinum. So there is potential risk of spread of infection into vital regions.[5,8]

The predisposing factors suggested for pericoronitis are stress, respiratory infection, fatigue and hormonal changes. So stressing on predisposing factors is equally important while understanding the nature of disease.[5]

Growth of retromolar pad is negligible after age 16 years, so prediction of angular position of third molar to pericoronitis is more reliable after this age. To predict etiological role of angular position analysis after this age can be advocated.[6]

So the purpose of this study was to study its association with angular position of third molar and to evaluate predisposing factors associated with occurrence of pericoronitis in third molars.

Materials and Methods

The patients reported to the department of periodontology, Government Dental College and Hospital, Nagpur, for the treatment of signs and symptoms of pericoronitis were included in the study. Patients with age 17 to 40 years were included and carious third molars were excluded. 92 patients with 110 sites of pericoronitis were evaluated over a period of 3 months.

All the patients were examined using mouth mirror and willam's periodontal probe under artificial light in dental chair. A standard case history proforma (fig: 1) made for this study, was recorded by single examiner. The principle findings were related to nature of pericoronitis by observing signs and symptoms, its recurrence and predisposing factors by questioning patient. Patients were divided into four 6-year age groups ranging from 17-40 years. Intraoral radiographs were taken.

The winter's classification (1926) was used to determine the position of the third molar to long axis of second molar. It classified position such as mesioanglar, distoangular, vertical and horizontal in sagittal plane. Buccal version, lingual version and torsiversion in axial plane.

The diagnosis of acute and chronic pericoronitis was done based on the findings. The patient presented with extraoral swelling, trismus, pyrexia, dysphagia, severe or radiating pain, onset and/or lymph node involvement was diagnosed as acute pericoronitis. Moderate to dull pain, discomfort, duration of pain, sore throat and/or discharge were considered for diagnosis of chronic pericoronitis.

Descriptive statistics were used and findings were summarized using numbers and percentages.

Results

93 patients were diagnosed for pericoronitis for 109 sites of third molars. 59 (63.4%) patients were female and 34 (36.6%) patients were male (Table1). Male to female ratio reporting to hospital was 1:1.73 at the time of study.

The peak age group affected was 23-28 years and included 40 patients (43.01%) followed by age group 17-22 years which included 28 patients (30.11%). And 29-34 years and 35-40 years being least affected with 17 (18.28%) and 8 (8.60%) patients respectively (Table1).

Out of 93, 18 patients showed bilateral involvement. Mandibular molars were involved more commonly with 105 sites.

Among mandibular molars, pericoronitis is most commonly associated with vertical position showing in 53.33% (56) of sites, followed by distoangular position in 36.20% (38) sites, then mesioangular position in 8.57% (9) sites and least seen in horizontal position in 1.90% (2) of sites (Table 2). 29 sites of 105 sites showed buccal placement and 8 sites showed lingual placement and rest (69) sites had normal placement of mandibular molar(Table 3).

Only 4 sites of maxillary molar were involved. All patients showed unilateral involvement. Vertical position was present in 2 sites, 1each with mesioangular and distoangular position (Table 2). 3 out of 4 maxillary molars were placed buccaly while 1 had normal placement. (Table 3).

110 sites were classified as acute pericoronitis affecting 57 sites which were most common followed by chronic form with 40 sites and 13 sites were diagnosed as subacute pericoronitis (Table 4). Pericoronitis had manifested itself more commonly in half to 2/3 rd erupted teeth (Table 4).

Few patients had predisposing factors for pericoronitis (Table 5). Upper respiratory tract infection (19) being most common followed by stress (14) then hormonal problems (1). 41 (45.56%) patients had recurrent attack of pericoronitis and had taken treatment for it.

Table 1: Frequency distribution of pericoronitis patients by age group and gender

Age group (Years)	Male	Female	Total
17-22	12	16	28 (30.11%)
23-28	15	25	40 (43.01%)
29-34	5	12	17 (18.28%)
35-40	2	6	8(8.60%)
Total	34 (36.6%)	59 (63.4%)	93

Table 2: Distribution of angular position in maxillary and mandibular region

Position	Mandibular	Maxillary
Mesioangular	9 (8.57%)	1 (25%)
Vertical	56 (53.33%)	2 (50%)
Distoanular	38 (36.20%)	1 (25%)
Horizonal	2 (1.90%)	0
Total sites	105	4

Table 3: Distribution of buccopalatal/buccolingual position in maxillary and mandibular region

Position	Mandibular	Maxillary
Buccal	29	3
Lingual/Palatal	8	0
Normal	68	1
Total	105	4

Table 4: Distribution of acute, subacute and chronic pericoronitis in relation with amount of tooth erupted

Amount of tooth erupted	Acute pericoronitis	Subacute pericoronitis	Chronic pericoronitis	Total
Tip	7	2	8	17
1/3rd	14	3	4	21
Half	15	5	15	35
2/3rd and more	21	3	13	37
Total	57 (51.82%)	13 (11.82%)	40 (36.36%)	110

Table 5: Distribution of patients by predisposing factors

Predisposing Factors	Patients presented
Hormonal problems	1
URTI	19
Stress	14
None	59
Total	93

Discussion

Pericoronitis is an inflammatory condition of pericoronal flap commonly affecting third molars, mostly seen in young adults. Symptoms of pericoronitis ranges from mild discomfort, pain on biting as seen in chronic periocoronitis to acute condition presenting with severe radiating pain with extraoral swelling, lymphoadenopathy and trismus.[5,9]

Pericoronitis can affect individuals of any age group. Peak age of occurrence varies between 21 to 25 years as observed by Key,[11] Baitaineh et al,[5] Hazza'a et al [9] and Akpata.[10] Finding of our study goes with it with maximum incidence age group is 23 to 28 years (43.01%) followed by 17 to 22 years (30.11%) (Table 1). Higher incidence of pericoronitis few years later to its eruption age could be due to longer exposure of irritants from oral cavity. [9]

Female preponderance is seen in this study affecting 63.4% of all patients included in study (Table 1). This findings are in accordance with the study carried out by Key,[11] Baitaineh et al (56.7%). [5] Key had said that in modern society though sexual disparity had seen in jaw size but it is not determinant for development of infection. [11]

Mandibular molars are seen more affected in our study. No disparity was seen in involvement of right or left sides. Bilateral concurrent pericoronitis was seen in 18 individuals (19.35%). Though as mentioned by Key it is a rare event merely affecting about 3% of patients, high occurrence is seen in our study may be due to pain, discomfort and trismus limiting the patient's ability to maintain oral hygiene and may be due to the repeated incidences of pericoronitis. He also had mentioned that patient's preference to retain both teeth is one of the factor for its occurance. [11]

The present study showed that in mandibular molars, vertically impacted teeth were more frequently affected by pericoronitis with involving 53.33% sites, followed by distoangular impaction with 36.20% of sites, mesioangular impaction with 8.57% of sites and least with 1.9% in horizontal impaction (Table 2). It is in agreement with previous studies by Bean et al[8], Hazza'a et al[9] and Akpata[10]. The percentage of vertical impaction was 50% as observed by Hazza'a et al[9]and 54.4% by Akpata[10]. These findings are in disagreement with the findings of Key[11] where mesioangular impactions were seen affecting most commonly with 34.4 %. This difference in findings by Key[11] may be related to its study population of different race with different anthropological profile. It accounts for length of ramus and mandibular body.[10]

A systematic review and meta-analysis carried out by Galvão et al also concluded that vertical positioned mandibular third molar has greatest chance of getting pericoronitis and the horizontal position decreases this chance.[12] In maxillary molars, only 4 sites of pericoronitis were diagnosed with vertical impaction producing 50% sites, distoangular and mesiangular with 1 site each (25%) (Table 2).

The co-relation of pericoronitis and angular position of third molar may be because of fact that some angular positions are more common in one population than others.[9] Teeth with zero or less angulation could be likely to erupt in oral cavity.[10] So when causative factors are present, teeth eruting in oral cavity may get affected by pericoronitis showing its association.

Out of 105 sites of mandibular third molars 29 were buccaly placed, 8 were lingually placed and 68 were in normal position. In maxillary third molars, 3 were buccaly placed and one was in normal position. The results could not br compared as there are no previous studies in literature regarding buccolingual position of third molars. (Table 3)

While comparing forms of pericoronitis, acute pericoronitis was diagnosed for 51.82% sites which

was most common form in this study. 36.36% sites were diagnosed as chronic pericoronitis. Subacute form was least with 11.82% (Table 4). Similar results were seen in study by Baitaineh et al.[5] They classified pericoronitis as acute and subacute where 56.86% acute cases were diagnosed.

In case of amount of tooth eruption, partially erupted teeth i.e. whose half, 2/3rd and more surface is erupted in oral cavity are afflicted with pericoronitis. Findings of Hazza'a et al[9] are in accordance with present study. Reason for it may be explained by partially erupted tooth are more likely to cause food lodgment, initiating inflammation in the space between tooth and tissues over it.

In agreement with previous studies by Key[11] and Baitaineh et al[5], upper respiratory tract infection (URTI) was the most common observed predisposing factor for pericoronitis (Table 5). By weakening of general condition, URTI increases risk of pericoronitis. There is weakening of defense mechanism owing to infection, altering oral microbiota balance. It might be explanation for increase in risk with illness. Due to proximity of third molar and nasopharynx, gram negative organisms have common pathogenic aspect with URTI and pericoronitis.[5]

As we know viruses are involved in the etiology of URTI, but role of viruses in pericoronitis is not yet clear. By influencing defense mechanism, viruses make host susceptible for subsequent bacterial superinfections. It may result into predisposition of pericoronal tissues to secondary invasion of bacteria. [13]

Next to URTI, stress was another factor predisposing to pericoronitis. Stress mentioned by participant was related to financial reasons, work load, exam, study, emotional turmoil and family problems. Key[11] and Baitaineh et al [5] also observed stress as predisposing factor after URTI. This is in disagreement with Bean et al[8], who reported stress as most common predisposing factor affecting 70% individuals. Stress may decrease the salivary flow resulting in reduction in lubrication of mucosa and mechanical debridement action. It may pave the way for inflammation of tissues.

Previous studies[11, 5, 8] have mentioned less relevance of menstruation with pericoronitis. Same was observed in this study

Pericoronitis has high recurrence rate.[9] In this study, 45.56% patients were suffered from pericoronitis previously. Bean et al[8] reported half of their subjects had previous flare ups. Hazza'a et al[9] noted very high recurrence rate with 86% cases had at least 2 episodes of pericoronitis. These differences in findings are may be result of differences in the rate of extractions carried out prophylactically or after first attack of pericoronitis.

Pericoronitis is an inflammatory condition of pericoronal flap. The operculum over tooth acts as a trap for food debris accumulation where invasion of bacteria occurs and it acts as incubation zone for anaerobic bacteria for rapid multiplication. The inflammatory reaction may result from toxins released by bacteria, which results into swollen operculum due to inflammatory exudates.[8,9] This explains etiopathogenesis of pericoronitis. The exciting cause is cuspal impingement causing trauma to the operculum. [9]. It adds into severity of it. Further inflammation may spread to potential facial spaces increasing risk for spreading infection to vital regions.[8] So to avoid it early diagnosis and treatment is necessary.

Conclusion

Pericoronitis is inflammatory condition affecting all ages with female preponderance. The peak age of occurrence is 23 – 28years. Vertically positioned third mandibular molar are most commonly affected by pericoronitis followed by distoangular, mesioangular

and horizontal. It manifests itself more in normally positioned mandibular third molar than buccal and lingual position. In maxillary third molar, vertical position is most common followed by distoangular and mesioangular position. In buccolingual plane, normal position was more common in mandibular third molars and buccal position was more common in maxillary third molars.

It is seen more frequently in partially erupted teeth with high recurrence. Bilateral pericoronitis is less common than unilateral one. Acute pericoronitis is more common form. Upper respiratory tract infection is the most common predisposing factor followed by stress and hormonal problems. Considering high recurrence and potential risk, early decisive treatment should be recommended.

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