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Presentation of Odontogenic Infection- A Prospective Analysis

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ABSTRACT

Introduction: Infections of the maxillofacial area constitute a frequent entity in the daily practice of maxillofacial surgeons. Human beings are subjected to various infections. Although dental health in India is improving, infections in the orofacial region are known to commonly arise from dental origin. Odontogenic infections are one of the most frequently occurring infectious processes known to both antiquity and present day health care practice. Although there is very little data regarding the incidence of infections of oral cavity, no one doubts its relevance.
Material and Methods: Patients suffering from various infections of the maxillofacial region were examined, clinically and radiologically. Treatment done was extraction, incision and drainage and antibiotic therapy.
Result: A total of 82 patients with Maxillofacial infection, in one year duration, were included in the study. The age ranged from 5yrs to 75yrs, In all the patients included in the study five clinical signs were recorded i.e. Swelling, Trismus, pain, fever and difficulty in breathing, Out of 82 patients 58.54% of the patients had the foci and infection on left side. Mandibular teeth are involved in 71.95% of cases and 28.05% maxillary teeth are involved.
Conclusion: The correct diagnosis and institution of appropriate treatment is a key to successful management of odontogenic infections. Untreated or inappropriately treated simple periapical abscess has a potential of causing local extensions, distant site involvement and in some cases fatal complications. A simple periapical abscess in a healthy individual usually responds well to local therapy with or without surgical drainage

Keywords- Odontogenic infection, abscess, incision and drainage

INTRODUCTION

Infections of the maxillofacial area constitute a frequent entity in the daily practice of maxillofacial surgeons. Speaking of maxillofacial infections, a wide range of conditions having a nature, etiology, clinical presentation and seriousness are included in this definition. They may range from simple cases that are treated as outpatients to sepsis which may cause morbidity and mortality that require early and aggressive intra hospital treatment.[1]

Human beings are subjected to various infections. Although dental health in India is improving, infections in the orofacial region are known to commonly arise from dental origin. Odontogenic infections are one of the most frequently occurring infectious processes known to both antiquity and present day health care practice. Although there is very little data regarding the incidence of infections of oral cavity, no one doubts its relevance.[2, 3]

Three contemporary problems confounding the clinical evaluation of patients with skin and soft tissue infection are diagnosis, severity of infection, and pathogen-specific antibiotic resistance

patterns. Dozens of microbes may cause soft-tissue infections, and although specific bacteria may cause a particular type of infection, considerable overlaps in clinical presentation exist. Early recognition of such infections and appropriate therapy are essential. Dental infections can occur in number of ways: (1) via the introduction of pathogens of extra-oral origin, (2) through a change in the balance of indigenous flora, or (3) with the entry of bacteria into the normally sterile vital pulp of the tooth.[2]

Aim

The aim of this study was to perform statistical analysis of the epidemiology of the dontogenic infections, their characteristics and treatment modalities.

MATERIAL AND METHOD

On a prospective basis, patients suffering from various infections of maxillofacial region of odontogenic origin, who reported to the department of Oral & Maxillofacial Surgery, People's College of Dental Sciences & Research Centre, were inducted into the study during the period of 1st Jan 2014 to 31st December 2014. Patients of all ages were considered for the study. Detailed history was noted for the patients and a thorough clinical examination was done to diagnose the presence of an infection of maxillofacial region. The following variable were collected for each patient: age, gender, affected tooth, anatomical space involved, associated symptoms, treatment modality(extraction alone, extraction with incision and drainage) and number of intervention required, need of hospitalization and duration of hospitalization. Radiological examination of the area of chief complaint was done if required to rule out the cause of infection (involved tooth).

RESULTS

All the patient with maxillofacial swelling of odontogenic origin were included in the study. A total of 82 patients with maxillofacial infection, in one year duration, were included in the study.

TABLE 1: Age distribution of the patient

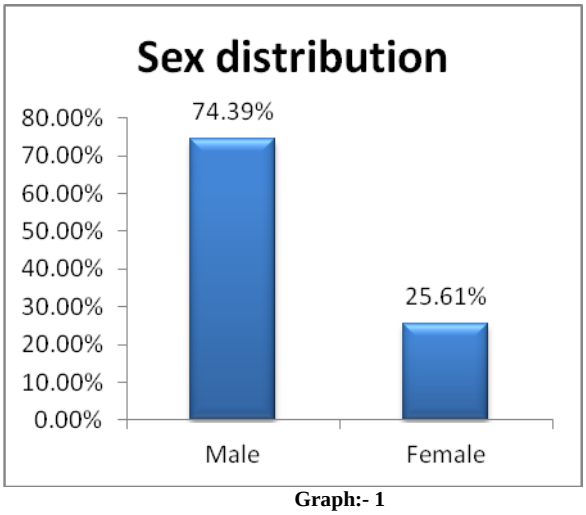
Total no. of patients	Maximum age	Minimum age	Mean age
n= 82	75yr	5yr	33.21 yrs

TABLE 2: Decade wise distribution (n=82)

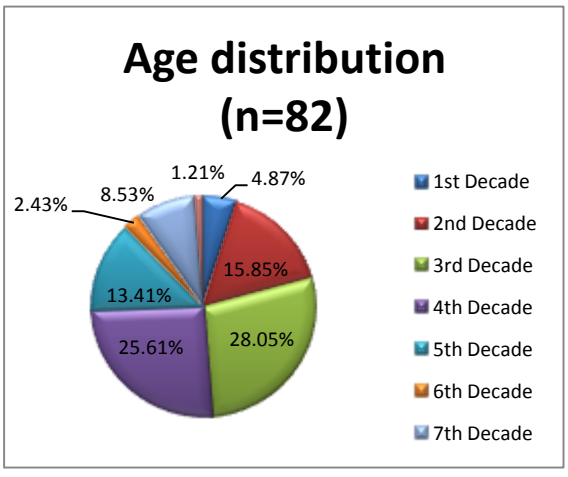
Age Group	Number of Patients	Percentage
1st Decade	4	4.87%
2nd Decade	13	15.85%
3rd Decade	23	28.05%
4th Decade	21	25.61%
5th Decade	11	13.41%
6th Decade	2	2.43%
7th Decade	7	8.53%
8th Decade	1	1.21%

TABLE 3: Sex distribution

Total no. of patient	Male	Female
82	61 (74.39%)	21 (25.61%)



Graph:- 1



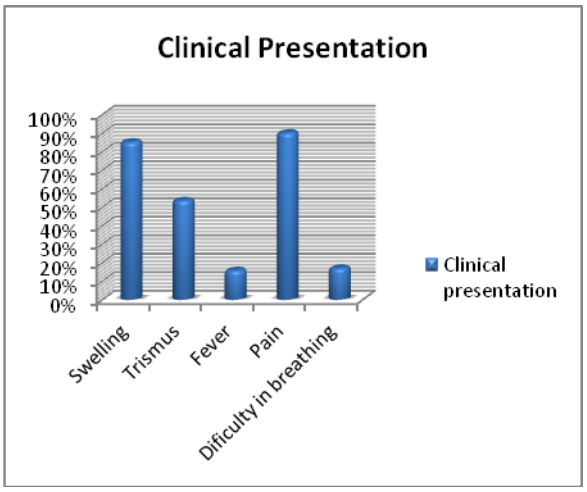
Graph:- 2

The age ranged from 5 yrs to 75 yrs with the mean age of 33.21 yrs (table-1). 28.3% of the patient were in 4th decade of life (maximum) and 1.21% in 8th decade of life (minimum) (table-2, graph-1). There was a male predominance found in this

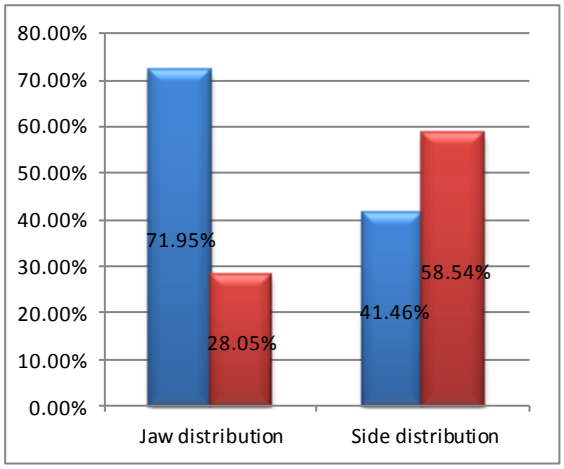
study. Out of 82 patients 61 patients (74.39%) were male and 21 (25.61%) were female. Male to Female ratio was 2.9:1 (table-3, graph-2).

TABLE 4 : Clinical findings

Clinical feature (n=82)	number of patients presented with	Percentage
Swelling	70	85.36%
Trismus	44	53.66%
Fever	13	15.85%
Pain	74	90.24%
Difficulty in breathing	14	17.07%



Graph:- 3



Graph:- 4

TABLE 5: Site distribution

Site (n=82)			
Mandible	**Maxilla**	**Right**	**Left**
59 (71.95%)	23 (28.05%)	34 (41.46%)	48 (58.54%)

TABLE 6: Tooth invloved

Tooth	Number	Percentage
Upper right central incisor	2	2.43%
Upper right lateral incisor	1	1.21%
Upper right first premolar	1	1.21%
Upper right second premolar	4	4.87%
Upper right first molar	7	8.53%
Upper right second molar	4	4.87%
Upper left canine	2	2.43%
Upper left first premolar	2	2.43%
Upper left second premolar	1	1.21%
Upper left first molar	4	4.87%
Upper left second premolar	4	4.87%
Upper left third molar	1	1.21%
Lower left central incisor	2	2.43%
Lower left lateral incisor	2	2.43%
Lower left canine	3	3.65%
Lower left first premolar	5	5.88%
Lower left second premolar	5	5.88%
Lower left first molar	17	20.73%
Lower left second molar	10	12.19%
Lower left third molar	7	8.53%
Lower right central incisor	3	3.65%
Lower right lateral incisor	1	1.21%
Lower right canine	1	1.21%
Lower right first premolar	4	4.87%
Lower right second premolar	4	4.87%
Lower right first molar	9	10.97%
Lower right second molar	5	6.09%
Lower right third molar	6	7.32%
Total	117	

Table 9: Distribution of spaces:

Space	Number (n=82)	Percentage
Submandibular	25	30.49%
Buccal	18	21.95%
Submental	14	17.07%
Submassetric	7	8.54%
Sublingual	10	12.19%
Dentoalveolar	15	18.29%
Pterygomandibular	3	3.65%
Cannine	7	8.53%
Palatal	2	2.43%
Infraorabital	1	1.21%

Table 10 :Site and frequency of incision and drainage

Incision and drainage(n=82)	Intra-Oral (n=61)	Extra-Oral (n=61)	Drainage Tube
61 (74.39%)	45(73.77%)	16(26.23%)	19(31.15%)

In all the patients included in the study five clinical signs were recorded i.e. Swelling, Trismus, pain, fever and difficulty in breathing. In this study, most common clinical presentation was pain (90.24%) and swelling (70%) followed by trismus (53.66%). It is surprising that only15% of the patients had fever.

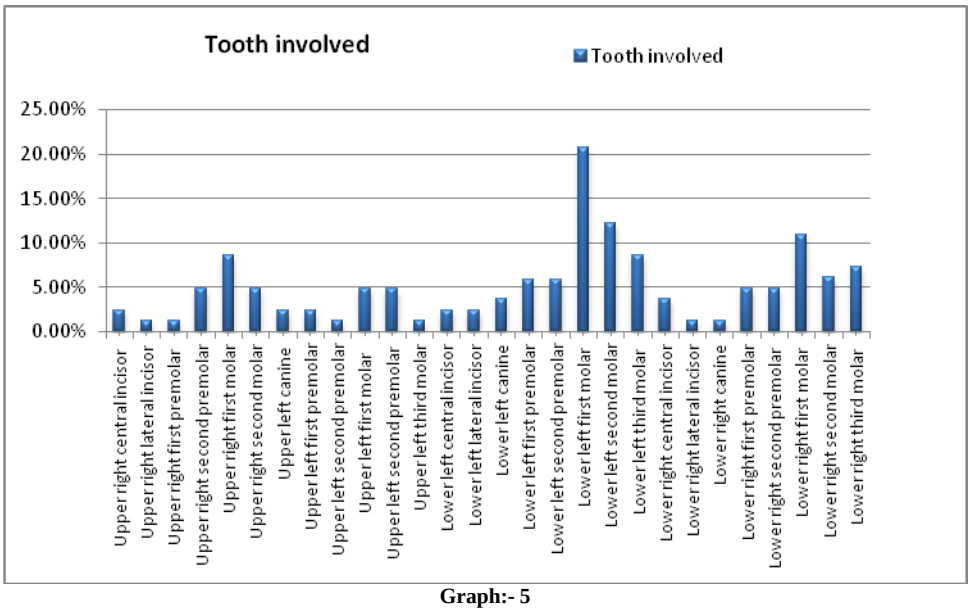
Out of 82 patients 58.54% of the patients had the foci and infection on left side. There was a statistical significance between the distribution of foci in upper and lower jaws. Mandibular teeth are involved in 71.95% of cases and 28.05% maxillary teeth are involved.

The first molar tooth was most commonly associated with infection. (n = 54). The teeth involved in the infection were equally distributed in all the four quadrants of the dentition. Upper left central, lateral

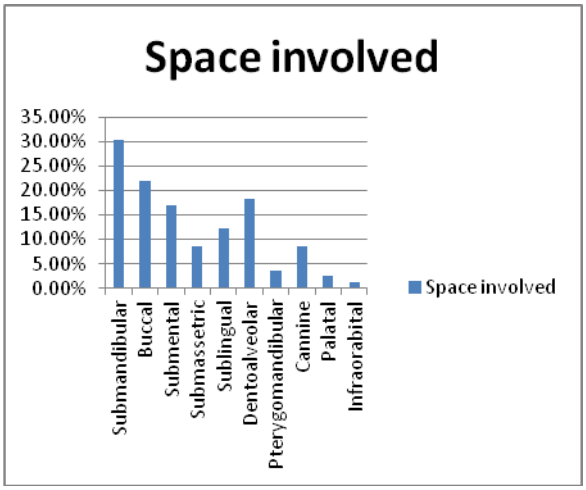
incisors and upper right canine were not found to be responsible for any infection formation in this study. The correlation of the tooth involved and the site of infection formation was highly significant (P = 0.01).

In 82 patients, 102 spaces were involved, with majority of patients reporting with involvement of multiple spaces.

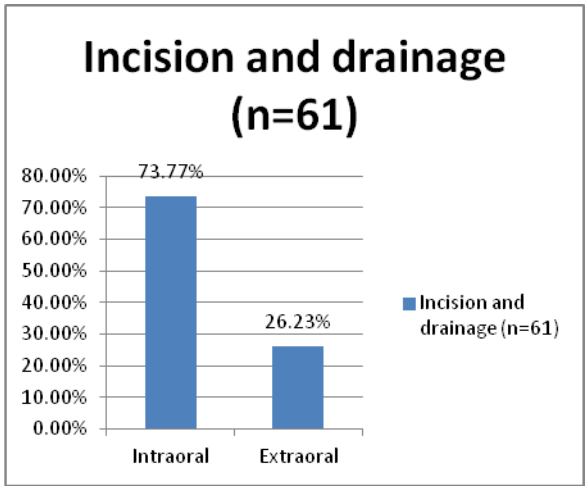
Submanidbular (30.49%) and buccal (21.95%) were predominantly involved followed by submental (17.07%), dentoalveolar (18.29%) and sublingual space (12.19%). We did not found any case of temporal space and Ludwig's angina during the study period.



Graph:- 5



Graph:- 6



Graph:-7

The conditions were managed by extraction or root canal treatment of offending tooth alone or along with incision and drainage (by extraoral or intraoral approach).

Extraction alone was performed in 21 cases (25.61%). Incision and drainage was done in 74.39% of cases, of which 73.77% were done intra orally and 26.23% extaorally. Drainage tube was placed in only 31.15%. Duration and frequency of changing drainage tube was dictated by the response of the patient

Out of 82, 28 patients were hospitalized with the period of hospitalization ranges from 3 days to 7 days. Out of this 28 patients 20 patients were diabetic and are from 5th to 6th decade of

life. All of this 28 patients have increased WBC count.

Random blood sugar analysis was performed for all cases. 32 patients were reported with increased blood sugar level. Out of these 32 patients 20 patients were admitted to hospital for management. WBC counts were increased in 62 (75.6 %) patients.

DISCUSSION

Origin of maxillofacial infection could be from a periapical lesion, periodontal condition, pericoronal problem, post surgical infection ore direct trauma resulting in epithelial breach. Out of these cause odontogenic ones are most commonly encountered. Mostly ignored or ill-treated decayed tooth becomes the root cause of a serious and life threatening infection. In a country like India where healthcare providers are inadequate in number and facilities are less, ignorance of dental problems adds to worsening condition. Complications such as retropharyngeal spread and intracranial or mediastinal spread and airway obstruction indicate the potentially serious nature of infections[4].

Kangara et al (1980)[5], Haug et al (1991)[6] and Haung T (1991)[7] in their studies found that there is male predominance in patients having maxillofacial infections, However Hunt (1989)[8] claimed that both sexes are equally involved. In our study there was male predominance, out of 82 patients, 61 were male and 21 were female.

HAUG et al (1991)[6] in his study found that the most common age range for all odontogenic infections was 25 to 30 years. Huang T (2004)[7] found the mean of patients with deep neck infection was 49 years. Flynn T. (2006)[9,10] claimed that the mean age of patient with severe odontogenic infection was 34.9 years. Studies by Rega A (2006)[11] and Tozoğlu S et al (2009)[12] showed that odontogenic infections are found in almost all age group ranging from 4 to 80 years. However in our study the age group affected was 5 to 75 years and the mean age was 3.21 year.

The incidence of odontogenic infections is increasing in the general adult population and this calls for the need of greater patient education and awareness and increase in supply and demand of dental care.[13]

The incidence of tooth involved infectious process was fairly distributed across the whole dentition. Certain teeth were not involved in an infection formation in this study group like upper right canine and third molar and upper left central and lateral incisor. The tooth involved in the infection process was directly responsible for the site of development of the infection due to the anatomic spatial relation of the root tip to the muscle attachment in that area. The dental anatomy, particularly the root length plays a significant role in determining the space involved. Involvement of the maxillary canine and premolars most commonly led to spread of infection in the Infraorbital / Canine space. Infections related to the maxillary third molars were less frequently identified. The mandibular third molars were frequently associated with Masticator space infections with or without involvement of Buccal or Submandibular spaces (Multiple space infections).

Storoe et al (2001) [14] in their study found that the most commonly involved tooth in ododntogenic infection is mandibular third molar. Flynn T et al (2006) [9,10] and Tozoglu et al (2009)[12] found the association of upper and lower molars more frequent. The first molars, upper and lower, were involved in maximum number of cases in this study population (n = 62). This might be because the permanent first molar is the first tooth to erupt in the oral cavity, thus has the maximum exposure to cariogenic food and bacteria, making it more prone for caries and periodontal diseases and hence directly responsible for more number of odontogenic infection.

Haung (2005)[15] found that the most commonly involved space is Parapharyngeal space, Haug (1991)[6], Rega A (2006)[11] and Tozoglu et al (2009)[12] stated that the Buccal

and Submandibular spaces are most frequently involved. Flynn (2001) [9,10] claimed Masticator, Preimandibular and Peripharyngeal spaces were most commonly encountered. In our study we found the most commonly involved space in odontogenic infection was Submandibular followed by Buccal and Submental.

Acute maxillofacial infections usually present with signs and symptoms in the form of pain, swelling, pyrexia, trismus and difficulty in breathing. In this study we had recorded these prominent signs, symptoms and duration.

Bridgeman et al (1995)[16] in their study at the Royal Melbourne Hospital in which they reported a prevalence of 100% for pain and 98% for swelling as a clinical presentation. In our series of 82 patients, most frequent clinical presentation was pain (90%) and swelling (85%).

Patients tend to ignore pain alone as a symptom and often resort to the analgesic drugs to mask this important clinical symptom and in the bargain report late to the hospital.

Bridgeman et al (1995) [16] claimed that 50% patients with maxillofacial infection present with fever. Haug et al (1991)[2] suggested that the rise in temperature is one of the prominent symptom of maxillofacial infection. In our study, only 15.85% reported with fever. Generally patients with acute bacterial infections may present with fever, and elevation of body temperature above normal. 84.15% of patients with bacterial infection had no pyrexia in our study.

Pyrexia, in general is caused by pyrogens, which bring about the fever and these pyrogens may be exogenous (e.g. endotoxins of gram negative bacteria) or endogenous (e.g. cytokines released from host cells in response to the infection). The microbiology of orofacial infections as demonstrated in the literature are the most common reasons for fever in proportion to our patients with acute maxillofacial infection. Basically pyrogens are produced as a result of bacterial infection and act by causing elevation of the set point of hypothalamic thermoregulatory centre, which in turn results in vasoconstriction, decreased peripheral heat loss and fever. The other reason for developing fever in these patients is decrease in the oral intake of the fluids and solid food leading to dehydration and malnutrition.[17,18]

Trismus, a common clinical feature of odontogenic infection, was seen in 44 (53.66%) out of 82 patients which correlates with the study of *Bridgeman et al* (1995)[16] where 46% of trismus patient were seen. Flynn T. (2006)[9] found dysphagia and trismus in 70% of the patients in his study. Trismus commonly manifests when Masticator spaces.

The correct diagnosis and institution of appropriate treatment is a key to successful management of odontogenic infections. Untreated or inappropriately treated simple periapical abscess has a potential of causing local extensions, distant site involvement and in some cases fatal complications. A simple periapical abscess in a healthy individual usually responds well to local therapy with or without surgical drainage.[4,5,19]

Management of acute orofacial odontogenic infection should always the treatment of offending tooth either endodontically or surgical along with surgical drainage / decompression of the involved tissues, supplemented by appropriate antibiotic administration.

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