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Key factors of odontogenic infections requiring hospitalization: A retrospective study of 102 cases

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ABSTRACT

Objective: This retrospective study describes the clinical and sociodemographic data collected from patients hospitalized due to odontogenic infections.
Materials and Methods: A retrospective study was conducted in patients admitted presenting odontogenic infections at Besat Educational Hospital between 2010 and 2015.
Treatment: consisted of intravenous antibiotics, surgical incision and drainage, and extraction of involved teeth. The Study variables were categorized as demographic, preadmission, preoperative, anatomic, treatment, involved teeth and complications. Appropriate descriptive statistics were calculated.
Results: The sample consisted of 102 patients (62 males, 40 females) with a mean age of 28.7 ± 13.19 years. Mandibular posterior teeth were the most frequently involved (72.4%). Moreover, trismus, fever, and dysphagia were the most frequent preadmission clinical variables; in 51%, 24.5%, and 22% of cases respectively. The perimandibular, masticator and peripharyngeal spaces were infected in 72%, 61%, and 3% of cases, respectively. The combination of intravenous penicillin and metronidazole were the most frequently prescribed antibiotics (73.5%). General anesthesia was needed in 89% and local anesthesia in 11% of patients before surgical treatment. In addition, 4 patients required urgent tracheostomy for airway management. The average number of drained anatomic spaces was 1.5 spaces per patient. Additionally, the average length of hospital stay was 6.8 days and mortality recorded in this study was only one case.
Conclusion: Understanding of the key variables involved in severe odontogenic infections has been greatly improved by recent studies and reinforced by the present study. The authors concluded that the major criteria for hospital admission of patients with severe odontogenic infections are trismus, fever, and dysphagia.

1. Introduction

Odontogenic infections (OI) are the most common type of head and neck infections among adult population [1]. Although most patients with mild OI can be managed as outpatients successfully, however in some cases OI can cause extensive morbidity and sometimes result in death. The management of these severe OI generally requires emergency surgical treatment and prolonged hospitalization [2]. Generally, predisposing factors such as alcoholism, immunosuppression, uncontrolled diabetes mellitus and multiple underlying medical conditions are reported to increase the risk of OI [3]. The purpose of this study is to evaluate the demographic and clinical aspects associated with the treatment of severe OI in patients managed in hospital settings.

2. Material and methods

Post to the approval by the institutional review board of Hamadan Besat Educational Hospital (Ethical approval IR.hmu.sd.Rec.1394), the medical records of patients admitted for treatment of severe OI from June 2010 to April 2015 were reviewed. The criteria for hospital admission were progressive

☆ AsianAOMS: Asian Association of Oral and Maxillofacial Surgeons; ASOMP: Asian Society of Oral and Maxillofacial Pathology; JSOP: Japanese Society of Oral Pathology; JSOMS: Japanese Society of Oral and Maxillofacial Surgeons; JSOM: Japanese Society of Oral Medicine; JAMI: Japanese Academy of Maxillofacial Implants.

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swelling of the face or neck suggesting abscess or cellulitis, dysphagia, dyspnea, and/or trismus (maximum interincisal opening <20 mm). Data was collected from patients' records realizing age, gender, and occupation as demographic variables of this study.

Preadmission variables included smoking, addiction, preadmission antibiotic therapy, and the presence of immunocompromising diseases (such as diabetes, human immunodeficiency virus [HIV] seropositivity, use of immunosuppressive medications, severe kidney disease, and cancer chemotherapy within the previous year). Moreover, the time-related variables included the onset of swelling before admission, and the length of hospital stay (LHS).

The Preoperative clinical variables included causative teeth, dyspnea, dysphagia, odynophagia, tachycardia, trismus (maximum interincisal opening ≤20 mm), WBC, blood sugar, and admission core temperature.

Involved teeth were determined as being carious clinically and radiographically as mentioned in the patients' records. For the purpose of better statistical analysis, upper and lower teeth were grouped into three categories: anterior (incisors + canine), posterior (premolars + 1st and 2nd molars) and third molars.

Furthermore, the anatomic variables included fascial spaces involved by cellulitis or abscess, and number of spaces affected in each patient. It is worth mentioning that cellulitis or abscess formation was diagnosed with clinical evaluation (swelling, redness, fluctuation, discharge, etc. . .) and enhanced computed tomography assessment. (Fig. 1) In addition, all of the cases included in this retrospective study were diagnosed as abscesses. The treatment variables included the anatomic spaces drained, the number of drains used, and antibiotic(s) used. Anesthesia variables were: type of anesthesia (general or local), and type of intubation (endotracheal or tracheotomy).

Finally, the correlations between length of hospital stay, and WBC count, admission temperature core, the number of drained facial spaces, trismus, dysphagia and fasting blood sugar were evaluated in this study. These correlations were analyzed using Mann-Whitney or Spearmann's tests. P values <0.05 were considered as significant.

3. Data management and analysis

Data were recorded retrospectively on standardized collection forms. A database was constructed using Microsoft Excel (Microsoft, Redmond, WA) and imported into SPSS 11.5 (SPSS, Inc, Chicago, IL) for statistical analysis. Descriptive statistics were computed for all of the study variables.

4. Results

The medical records of 102 subjects (62 male, 40 female) from 1 to 68 years of age (mean 28.7 ± 13.19) were enrolled in this study. There were 52 (51%) farmers and/or workers, 28 (27.5%) housewives, 18 (17.6%) students, and 4 (3.9%) employees. Three subjects (3%) had immunocompromising diseases (2 insulin-dependent diabetics and 1 renal failure). Moreover, there were 21 (20.6%) smokers and drug addicts. At the time of entry into this study, 61 (59.8%) subjects were taking various oral antibiotics, predominantly penicillin and metronidazole, as detailed in Table 1.

The most frequently involved teeth were the lower posterior teeth (bicuspids and first and second molars) (44.8%), followed by the lower third molars (27.6%). Anterior teeth caused the least amount of severe odontogenic infections and hospitalization in this study.There was no significant difference in the right or left side of causative teeth frequency (Table 2).

On admission, 3 subjects (2.9%) reported dyspnea, 23 (22.5%) complained of dysphagia and odynophagia, and 53 (51.9%) had trismus (MIO ≤ 20 mm). The initial core temperature ranged from 36.6 °C to 38.8 °C, with a mean ± SD of 37.50 ± 0.48 °C. The initial mean ± SD WBC was 12.4 ± 4.5, with a range of 4.5–30.3 × 10^3/μL. Blood sugar test on admission showed a range from 68 to 215 with a mean ± SD of 103.3 ± 23.5 mg/dl. Subjects presented with a history of 8.3 ± 6.25 days of preoperative swelling (range, 1–30 days) (Table 3).

Fascial spaces involved with odontogenic infections are shown in Table 4. The most commonly infected space was the submandibular (58 spaces, 56.8%), followed closely by the buccal and pterygomandibular (47 spaces, 46%). The right side spaces (60%) were more affected by infection than the left side spaces (40%) (Table 4).

Topical anesthetics and mild sedation were used for analgesia during incision and drainage in 11(10.8%) subjects, and general anesthesia was used in the other cases (89.2%). As far as airway management is concerned, endotracheal intubation through direct laryngoscopy took place in 87(85.3%) subjects. However, 4(3.9%)

Table 1
Demographic and preadmission variables.

	N (%)	Mean ± SD	Range
Age (years)		28.7 ± 13.19	1–68
Gender			
Male	62(61)		
Female	40(39)		
Job			
Farmer	36(35.29)		
Housewife	28(27.45)		
Student	18(17.65)		
Worker	16(15.69)		
Employed	4(3.92)		
Immune system compromise			
Diabetes	2(2)		
Renal failure	1(1)		
Smoking ± Drug addiction	21(20.6)		
Preadmission antibiotic therapy			
Not recorded	38(37.3)		
Yes	61(59.8)		
No	3(2.9)		

Table 2
Involved teeth in spreading odontogenic infection.

Involved teeth	Right (N)	Left (N)	Total N (%)
Mandibular third molars	21	16	37(27.6)
Other mandibular posterior teeth	30	30	60(44.8)
Maxillary third molars	3	5	8(6)
Other maxillary posterior teeth	8	13	21(15.7)
Maxillary anterior teeth	3	3	6(4.5)
Mandibular anterior teeth	1	1	2(1.5)
Total	66(49.3%)	68(51.7%)	134

Table 3
Preoperative clinical variables.

	N (%)	Mean ± SD	Range
Dyspnea	3(2.9)		
Dysphagia	23(22.55)		
Trismus (MIO ≤ 20 mm)	53(51.96)		
Tachycardia	2(1.96)		
Odynophagia	23(22.55)		
White blood cell count on admission (*10^3)		12.4 ± 4.5	4.5–30.3
Admission core temperature (°C)		37.50 ± 0.48	36.6–38.8
Blood sugar (mg/dl)		103.35 ± 23.51	68–215
Days of preoperative swelling		8.30 ± 6.25	1–30