Epidemiology and clinical manifestations of odontogenic infections

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Abstract

Aim: Comparison of socio-demographic and clinical data regarding odontogenic infections among hospitalized and ambulatory adults in Albania.
Methods: The clinical and socio-demographic data of 159 patients treated in Maxillo-facial Surgery Service at University Hospital Center, Tirana, during the year 2011, were the basis of this retrospective study. Hospitalized and outpatients with odontogenic infections were included in this study.
Results: No significant differences were found in age, gender, social status or education of the two groups of patients. A high percentage of hospitalized patients had trismus, edema of the floor of the mouth and decreased mobility of the tongue. The most frequent cause of odontogenic infections in these patients were the mandibular third molars followed by the mandibular first and second molars, whereas in outpatients this role belonged to mandibular first two molars.
Conclusion: Important differences exist in the clinical features of odontogenic infections among patients with and without need for hospitalization. Some of these features can help identify potential cases that require hospitalization.

Keywords: characteristics, infection, mandibular, odontogenic.

Introduction

Odontogenic infections are among the most frequently encountered infections afflicting humans. In the vast majority of the patients these infections are minor and are resolved either by spontaneous drainage through the gingival tissues of the tooth or by extraction of the offending tooth. Chronic infections from the apex of the tooth to the surface mucosa or skin are not uncommon in populations who receive little or no dental care (1). A great deal of pain and suffering accompanies the occasional establishment of these infections in maxillary sinus space, or mandibular spaces. Removal of the offending tooth almost always results in rapid resolution of the infection, even with antibiotic therapy. Unfortunately, these minor tooth-related infections occasionally become serious and life-threatening. Aggressive surgical and medical care is necessary to prevent disastrous results.

Odontogenic infections constitute a serious pathological condition that is often considered an emergency in dental practice. They have the potential to spread extremely quickly from a localized infection in an infection that can provide airway compromise with the need for rapid and aggressive medical treatment and surgical intervention (2). Management of severe odontogenic infections can present a significant burden of health care system. In most cases, the first door to knock is the dental physician of primary care whose possibilities are the active intervention, drug therapy and referral to an oral maxillofacial specialist. It is important that the clinician be competent in the diagnosis of the disease, evaluation of progress and its severity, and the compilation of a definitive treatment plan (3).

The objective of this study was to compare the socio-demographic and clinical data of odontogenic infections among hospitalized and ambulatory adults in Albania. The identification of the characteristic profile of patients with and without need for hospital care can improve the early assessment of the gravity of infection and mode of treatment.

Methods

The basis of this retrospective study was the clinical and socio-demographic data of 159 patients with OI, treated at Maxillo-Facial Surgery Service at University Hospital Center "Mother Theresa" in Tirana, in 2011. Patients with odontogenic infections were divided into two groups, hospitalized and outpatients group and were submitted to study indexes. Socio-demographic and clinical data were collected retrospectively from patients' hospital records and laboratory results. Clinical variables included reported signs and symptoms, source of infection and anatomical spaces involved. Doctors upon admission had mainly documented attributes that appear abnormal (emergency). Consequently, in both study groups there were missing the qualities that were not recorded in patient's file.

The statistical program MedCalc 12 was used for data analysis. Chi-square test was used to compare proportions between variables. Student's t-test was used to compare the mean age between the two groups of the patients. The level of statistical significance was determined as $P \leq 0.05$.

Results

The mean age of the total patients included in this study was 16.8±37.7 years. The sample consisted of 132 (83%) hospitalized and 27 (17%) ambulatory patients during the one year study period. Although it seems that the age of hospitalized patients was slightly larger than the age of ambulatory patients, no significant difference was found regarding the mean age of patients in both groups. The mean age of ambulatory patients was 31.4±16.4 years, while the mean age of hospitalized patients was 36.2±18.4 years without significant difference between them ($t=1.4$, $P=0.1$). Also, no statistically significant difference was found between two groups according to gender, social status, or educational level.

According to education, most patients (57%, $P<0.01$) had finished high school, with an average socioeconomic status (61%, $P<0.01$). About 56% of ambulatory patients were males and 44% were

females, whereas 61% of hospitalized patients were males and 39% were females (P=0.7). A slight predominance of men compared to women was noticed among hospitalized patients (male-to-female ratio: 1.6). Young women seemed to have better habits regarding the general hygiene and oral health than their partners. Social status and education may not represent a reliable index taking into account the presence of some foreign hospitals and private centers that absorb part of the population with better financial opportunities.

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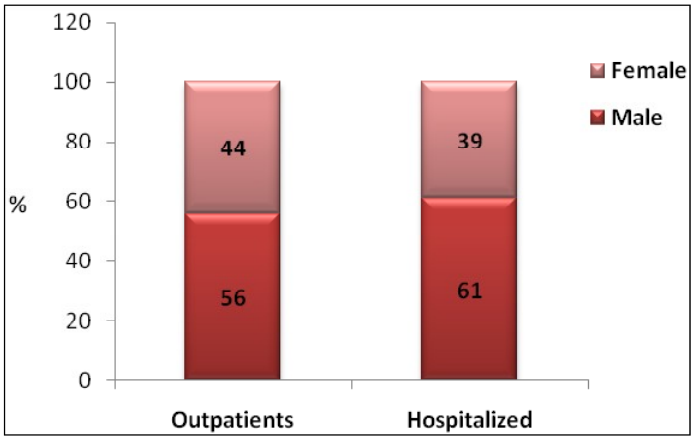
Figure 1. Distribution of patients by gender in both groups

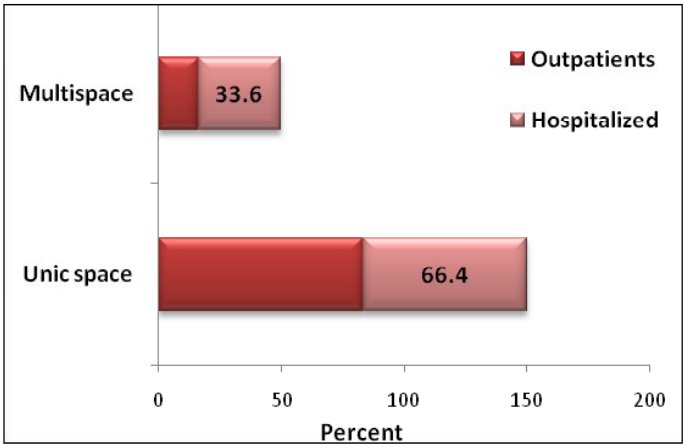


There were some important differences in the presenting signs of odontogenic infections between the two groups.

A higher proportion of the hospitalized patients had trismus (69%), floor of the mouth edema (8.6%) and decreased tongue mobility (9.1%).

The facial swellings in the hospitalized patients were predominately firm (70%) and the mean body temperature was 37.0±0.7°C, whereas in outpatients, the facial swellings were more fluctuant and the mean body temperature was 36.4±0.6°C. The mean leukocyte count in hospitalized patients was $13.2\times10^3/\mu l$(±4.2). The mean length of stay in hospital was four days. The hospitalized patients had a significantly greater number of multiple space infections (33.6%) than the outpatients group (16.3%, P<0.01) (Figure 2).

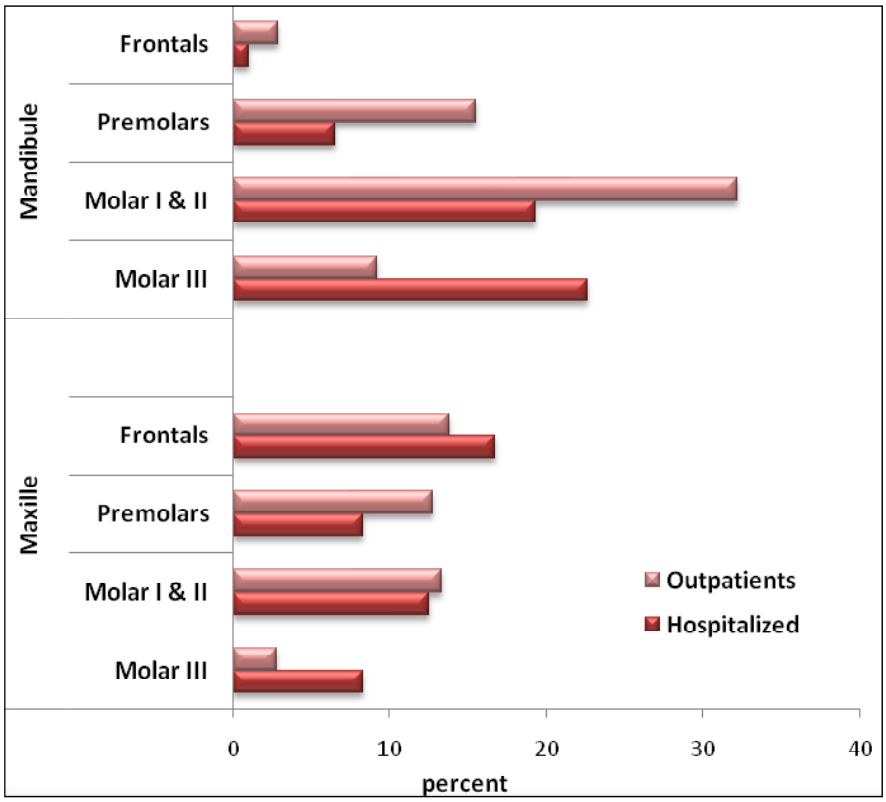
Figure 2. Involvement of anatomic spaces



The most commonly involved anatomical space in the outpatients group was the buccal space (44.6%), while in the inpatients group was the submandibular space (55.2%).

The submandibular, submental and submasseteric spaces were more likely to be involved in the hospitalized group than in the outpatients group ($P<0.05$).

Figure 3. Teeth that caused odontogenic infection



The most common source of odontogenic infections in the hospitalized group were the mandibular third molars (19.7%) and first/second molars (17.7%), whereas in the outpatients group were the mandibular first/second molars (25.5%) (Figure 3).

Discussion

Significant differences exist in the clinical features of odontogenic infections between patients with and without needs for hospitalization. Some of these features can help identify potential cases that require hospitalization. The practice often requires that physicians take into account the indications of hospitalization with the aim of early diagnosis and prevention of serious, life threatening conditions (4). Trismus and dysphagia have been reported as the most common symptoms that occur in hospitalized patients. Other researchers have also identified pain and mouth edema. In our study, inpatients were more likely to present with trismus, floor of the mouth edema, decreased tongue mobility and elevated temperatures, than outpatients. Trismus is often a readily noticeable sign and should alert the clinician of an upper airway problem that requires additional investigation. Such patients should be further evaluated for other risk factors such as an elevated floor of mouth, difficulty in swallowing and decreased air intake (1). These symptoms are suggestive of a severe course of infection and should be managed on that basis. Several studies have found the submandibular and buccal spaces to be the most commonly involved anatomical spaces in odontogenic infections (5-13). In a study, the buccal space was the most frequently involved space in the outpatient group, whereas the submandibular space was the most commonly involved space in the inpatient sample (5). The involved anatomical spaces can be graded in severity depending on their proximity to the airway and the threat they pose to compromising the airway or vital structures, such as the heart or brain (6). Buccal space infections are therefore of relatively low severity as they are less likely to threaten the airway or vital structures. On the other hand, submandibular space involvement poses a greater threat as the infection can result in severe swelling and trismus that may potentially hinder access to the airway. Consequently, these types of odontogenic infections are categorised as moderate or severe, and may be more likely to require intensive treatment (14-18). The most common source of odontogenic infections in the inpatient group was the mandibular third molars, while in the outpatient group it was the first/second mandibular molars. The mandibular bone is typically thin in the region of the posterior molars, which often leads to its perforation, allowing purulent collection to spread between fascia planes (1).

During the health visits, clinicians should ask about the time when the history of infection has begun, signs and symptoms changes, the progress of the disease, and previous drug treatments. Examination should include assessment of swelling, stretch and consistency, reaction of lymph glandules, trismus, sinusitis, changes in the teeth and firm tissues, and the temperature level (19,20). Indications for hospitalization include a body temperature of 37.7°C, dehydration, respiratory airways or vital structures threat, moderate or severe infection according to anatomic localization, the need for general anesthetics, and the need to control the systemic disease in affected patients.

Conclusion

This study highlights some important differences in features of odontogenic infections among hospitalized and outpatients in Albania. These changes may help clinicians in recognizing the trend of serious odontogenic infections that potentially may require hospital care.

Conflicts of interest: None declared.

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