Odontogenic infections in a dental emergency care unit: Eleven-year epidemiological analysis

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Abstract

Aim: To evaluate medical records from patients who underwent abscess drainage due to odontogenic infections in a public hospital in the city of Belo Horizonte (Minas Gerais, Brazil) during the period of 2003 and 2013. Methods: A retrospective analysis of cases which required drainage of abscesses due to dental infections. The types of therapeutic procedures analyzed were endodontic drainage, intraoral mucosa drainage, periodontal drainage, and extraoral drainage. Results: 162,902 cases required dental assistance, and 32,352 cases required drainage of abscesses due to dental infections. The most frequent approach was endodontic drainage (21,313 procedures); the least frequent procedure was extraoral drainage (922 procedures). Conclusions: Odontogenic infection is a common clinical condition in dental clinics. It should be diagnosed and treated as quickly as possible to avoid or minimize progression to more severe cases.

Keywords: focal infection; dental; epidemiology; retrospective studies.

Introduction

Initially well-localized dental infections of low complexity are usually resolved without complications when appropriate therapy is conducted in cases where patient does not have predisposing systemic conditions. However, inefficient therapy or lack of treatment may result in progression to severe conditions, such as osteomyelitis, Ludwig’s angina, airway compromise, necrotizing fasciitis, intracranial structure involvement and mediastinitis, which can be life-threatening complications1,2.

Rapid and aggressive treatment of odontogenic abscesses is necessary to avoid these complications2. Dental abscesses usually include secondary caries, trauma, or periodontal or endodontic infections3. Therapy can include the elimination of the causative focus, extraction, endodontic treatment, surgical drainage, and/or administration of antibiotics3.
The objective of this study was to review and analyze the treatment of odontogenic abscesses at the Emergency Department of the Municipal Hospital Odilon Behrens (HMOB) from 2003 to 2013.

Material and methods

This retrospective study was conducted in the Dental Department of HMOB of Belo Horizonte city, MG, Brazil, and was approved by the Ethics Committee on Human (research number: 56442116.7.0000.5129). Records dating from 2003 to 2013 were analyzed to determine the total number of drainage procedures performed for abscesses in the maxillofacial region. The factors evaluated were the types of drainage procedures performed: endodontic, intraoral or extraoral mucosa extraoral and sulcular (periodontal abscesses). The number of cases of Ludwig's angina, which may develop in simpler cases, was recorded for comparison between cases of different complexities.

Results

Analyses of 11 years of data from the Dental Department showed that 162,902 patients were treated (average, 14,809/year). Abscess drainage was performed 32,352 times or an average of 2,941 times per year (19.85%). The most frequent surgical procedure was endodontic abscess drainage with an average of 1,937 cases per year (65.86%), followed by intraoral tissue drainage (average of 683 cases - 23.23%) and periodontal abscess drainage (average of 224 cases - 7.61%). The least frequent procedure was extraoral drainage, with an annual average of 84 cases (2.84%). These results are shown in Table 1. Ludwig's angina is a complication still less frequent, with 135 cases in 11 years (0.41%).

The hospitalization for at least one day was necessary in 388 patients (average of 35 cases per year - 1.19%). The mortality occurred in 17 cases (average 1.5 cases per year - 0.05%). These results are shown in Table 2.

Discussion

Suppurative odontogenic infections represent an important challenge in the dental clinic because of the risk of propagation and serious potential complications. The assessment of infection involves the extent, etiology, and systemic conditions. Clinical data, images, and laboratory tests can determine if there is a localized infection or suggest the propagation of infection, and, based on these findings, therapeutic modalities are chosen. However, the most important procedures for orofacial suppurative infections are surgical drainage and removal of the primary source of infection.

In this study, treatment procedures were divided as follows: extraoral drainage, intraoral mucosal drainage, periodontal drainage, and endodontic drainage. It is important to emphasize that the HMOB did not use tooth extraction as a protocol for pain relief. HMOB has adopted drainage for treating dental infections.

Table 1 - Total number of patients from 2003 to 2013 in HMOB’s Dental Department and the frequency of infections and procedures.

| Year | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections | Total patients | Total infections |
|------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 2003 | 15,126         | 3,211           | 21.23          | 80              | 2.49           | 602             | 18.74          | 252             | 7.84           | 2,257          | 70.28          | 20              | 0.62           |                 |                 |                 |                 |
| 2004 | 14,908         | 2,970           | 19.92          | 70              | 2.35           | 533             | 17.94          | 231             | 7.77           | 2,122          | 71.44          | 14              | 0.47           |                 |                 |                 |                 |
| 2005 | 14,681         | 2,835           | 19.31          | 74              | 2.61           | 584             | 20.59          | 288             | 10.15          | 1,876          | 66.17          | 13              | 0.45           |                 |                 |                 |                 |
| 2006 | 14,496         | 2,975           | 20.52          | 80              | 2.68           | 528             | 17.74          | 254             | 8.53           | 2,100          | 70.58          | 13              | 0.43           |                 |                 |                 |                 |
| 2007 | 14,568         | 3,349           | 22.98          | 61              | 1.82           | 679             | 20.27          | 256             | 7.64           | 2,340          | 69.87          | 13              | 0.38           |                 |                 |                 |                 |
| 2008 | 15,119         | 3,693           | 24.42          | 72              | 1.94           | 697             | 18.87          | 325             | 8.80           | 2,585          | 69.99          | 14              | 0.37           |                 |                 |                 |                 |
| 2009 | 16,671         | 3,527           | 21.15          | 65              | 1.84           | 921             | 26.11          | 296             | 8.39           | 2,231          | 63.25          | 14              | 0.39           |                 |                 |                 |                 |
| 2010 | 15,787         | 3,207           | 20.31          | 76              | 2.36           | 784             | 24.44          | 263             | 8.20           | 2,069          | 64.51          | 15              | 0.46           |                 |                 |                 |                 |
| 2011 | 15,329         | 2,500           | 16.30          | 143             | 5.72           | 637             | 25.48          | 138             | 5.53           | 1,566          | 62.64          | 16              | 0.64           |                 |                 |                 |                 |
| 2012 | 13,803         | 1,990           | 14.41          | 96              | 4.82           | 759             | 38.14          | 128             | 6.43           | 1,004          | 50.45          | 3               | 0.15           |                 |                 |                 |                 |
| 2013 | 12,414         | 2,095           | 16.86          | 105             | 5.01           | 793             | 37.85          | 33              | 1.57           | 1,163          | 55.51          | 0               | 0              |                 |                 |                 |                 |

n = number; % = percentage

Table 2 - The frequency of hospitalization and mortality of patients from 2003 to 2013 in HMOB’s Dental Department.

| Year | Hospitalized patients | Mortality |
|------|-----------------------|-----------|
|      | n                     | n         |
| 2003 | 42                    | 2         |
| 2004 | 37                    | 1         |
| 2005 | 41                    | 3         |
| 2006 | 39                    | 1         |
| 2007 | 29                    | 2         |
| 2008 | 33                    | 1         |
| 2009 | 29                    | 1         |
| 2010 | 42                    | 1         |
| 2011 | 46                    | 3         |
| 2012 | 34                    | 2         |
| 2013 | 16                    | 0         |
and prefers the continuation of appropriate treatment. The number of cases of Ludwig's angina was cited to evaluate and compare the number of low complexity infections with that of highly complex infections without the intention to discuss local and systemic treatments for this type of infection. Well-localized infections may result in severe conditions and can be life-threatening; in 11 years, 388 patients (1.19%) required internment at least one day and 17 patients (0.57%) died due to complications of these infections.

After analyzing the data presented, infections involving the maxillofacial region represented 19.85% of all dental emergencies in this hospital. Of these patients, 96.71% underwent some kind of intraoral drainage. Extraoral drainages, which require greater surgical experience, anatomical knowledge and result in an external scar, represented only 2.84% of cases. Furthermore, the cases diagnosed as Ludwig's angina amounted to only 0.41% of all cases observed during this period.

Comparison of the number of procedures performed revealed that treatments of low complexity infections are more common daily for a dental surgeon than the high complexity ones. This confirms the need for professional knowledge to make a diagnosis and treat low complexity infections to avoid progression to serious conditions.

Many studies have been published on the epidemiology of dental infections\(^1^4^3^1^1\). However, studies on the anatomical drainage locations (local treatment) and their prevalence are few.

This study was conducted in the Dental Department of HMOB of Belo Horizonte city, MG, Brazil, which is a reference center for dental emergencies. It has full-time dentists and oral maxillofacial surgeons. It aims to serve an estimated of 4 million people in the Belo Horizonte metropolitan area.

Studies like the one conducted at Metro Health Medical Center (Cleveland, Ohio, USA), which serves 3.4 million people in Northern Ohio, showed that 86 cases of odontogenic infection were treated from 1983 to 1989\(^8^\). Another study conducted in Well Taub General Hospital in Houston (Texas, USA) analyzed 50 cases of oral maxillofacial infection from 1987 to 1990; of these, 43 cases were of odontogenic origin\(^4^\). From 1972 to 1990, 561 patients were admitted to the maxillofacial surgery division at the University of Turin, Italy, with acute infections. In the present study, we found that 32,352 patients had dental infections, an average of 2,941 cases annually requiring some abscess drainage procedure.

Factors such as geographical location, population density, socio-economic status, and the registration period should be considered in any comparison of statistical results\(^1^2^\). Additionally, the oral health of the population must be considered, taking into account hygiene and access to preventive and curative dental treatment.

This study, conducted at HMOB, on the incidence and evolution of these infections improves current understanding of dental care emergencies in a representative sample of the population of Belo Horizonte and provides data that could be helpful for developing strategies for preventing odontogenic infections.

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