Trismus and odontogenic infection - A retrospective study

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ABSTRACT

Odontogenic infections are polymicrobial, consisting of aerobic microorganisms, strict anaerobes and facultative anaerobes. It can either be localised or rapidly spread to the deep neck space causing space infection and need immediate emergency medical and surgical management. The aim of this study is to evaluate the association of odontogenic infection leading to trismus and its prevalence amongst patients visiting a university dental institution. 63 patients aged between 17 years old to 70 years old, whose details were obtained from the electronic database in Saveetha Dental College and Hospital from June 2019 till May 2020 were included in the study. All 63 patient records were assessed for the details such as age, sex, odontogenic infection type, odontogenic infection source, space involved, and pain score (VAS). The data were analysed. Results showed that in the odontogenic infection types, pericoronitis has a higher prevalence with 42.9%. The right mandibular third molar is the most prevalent (25.4%) odontogenic infection source. Amongst space involved, Submasseteric space is the most common space infected (42.9%). When the pain score VAS is assessed, patients have a higher VAS score between 6.00 (33.5%) and 8.00 (38.1%), respectively. There is a positive correlation between pericoronitis and mandibular third molar teeth. There is also a positive correlation between pericoronitis and Submasseteric space involvement. In conclusion, our study revealed a positive association between odontogenic infection involving Submasseteric, Submandibular space and painful trismus.

INTRODUCTION

Odontogenic infection is an oral disease arising from the tooth and associated structures due to dental caries and subsequent pulp and periapical involvement. The pathogenesis is of microbial origin (Bali et al., 2015; Venugopal and Maheswari, 2016; Subashri and Maheshwari, 2016). Based on their bacteria type, quantity, and degree of virulence, they may spread into the maxillary and mandibular anatomical spaces (Chaitanya, 2017; Maheswari et al., 2018; Misra et al., 2015). If untreated, it also spreads...
across the face, jaws, and neck (Kityamuwesi et al., 2015). Based on the various previous studies done by Huang et al. (2004), Bridgeman et al. (1995) and Bross-Soriano et al. (2004), there are many causes of head and neck infection. Still, odontogenic infection is the most common cause.

Odontogenic infections are mixed consisting of aerobes, strict anaerobes and facultative anaerobes (Steele et al., 2015; Muthukrishnan and Kumar, 2017; Subha and Arvind, 2019). It can either be localised to one region or have diffuse spread around tissue planes or further extend to the deep neck spaces and need immediate emergency medical and surgical management (Uluibau et al., 2005; Misra et al., 2015; Patil et al., 2018).

Trismus termed as “lockjaw” originated from the Greek word meaning gnashing (as in teeth). Trismus refers to the restriction of the range in the movement of the jaws. It results from spasm of the masticatory muscle (Chaitanya et al., 2018). Previously trismus referred to sequelae occurring after tetanus, but currently, it refers to mouth opening restriction due to various etiologies (Dhanrajani and Jonaidel, 2002; Choudhury, 2015). By definition, trismus is a limitation of mouth opening due to a reflex muscle spasm (Steele et al., 2015; Muthukrishnan et al., 2016; Patil et al., 2018). Trismus occurs as a temporary disorder and may resolve in less than two weeks; however, the trismus with permanent symptoms may also occur rarely, especially in advanced submucous fibrosis (Warnakulasuriya and Muthukrishnan, 2018). The disorder may interfere with normal speech and eating movement abilities, including swallowing (Tveterås and Kristensen, 2009).

There are various etiologies for trismus development. Few authors classify trismus based on their relation to the involvement of temporomandibular joint pathology - intra-articular and extra-articular causes. Other causes are trauma, infections, neoplasm, and iatrogenic (Loh et al., 2017).

The most important hallmark of all masticatory space infection is limited jaw opening. Early identification and treatment of odontogenic infection can prevent progression to life-threatening space infection (Dharman and Muthukrishnan, 2016). Oral infection from pericoronitis commonly spreads to pterygomandibular space and leads to trismus (Rohini and Kumar, 2017). Involvement of spaces in addition to clinical diagnosis requires advanced imaging modalities like MRI for the exact localisation of the lesion (Subha and Arvind, 2019). Cases of untreated odontogenic infection have led to complications such as cervical cellulitis and medias-

The objective of this case-control study was to evaluate the cases who presented with trismus from an odontogenic source of infection.

**MATERIALS AND METHODS**

The study was set in a university hospital setting, and Institutional Ethics Committee approval was obtained. 63 case sheets of patients who developed trismus from an untreated odontogenic infection between June 2019-March 2020 were retrieved from the oral medicine department. The case sheets, clinical photographs, medical history, medication history, treatment done was recorded. The data were analysed by 2 reviewers - the primary researcher and department faculty. Data collection was done by entering data into Microsoft Excel and then transferred into a statistical package for Social Sciences (SPSS) software. The independent variables present in the study were age, sex, odontogenic infection source, abscess, cellulitis, space infection and trismus. The dependent variables were trismus, mouth opening, interincisal mouth opening distance, pain, and VAS. The type of analysis used for this study was correlation and association.

**RESULTS AND DISCUSSION**

Case records of 63 patients who developed trismus from an odontogenic source were analysed. The age of the study group was between 17-70 years. Out of all odontogenic infections, pericoronitis had the highest prevalence, with 42.9%. The other sources of odontogenic infection were abscess (19%), osteomyelitis (1.6%), periapical pathosis (36.5%). The X-axis represents the type of Odontogenic infection, and Y-axis represents the number of patients who reported with the odontogenic infection mentioned. 27 patients reported with pericoronitis, 23 with the periapical lesion, 12 cases with abscess and one patient with osteomyelitis (Graph 1).

Tooth number 48, right mandibular third molar, is the most prevalent (25.4%) odontogenic infection source. The X-axis represents the source (tooth ) for Odontogenic infection, and Y-axis represents the number of patients. Tooth number 48 (25.4%)is the most common source of odontogenic infection in our study (Graph 2).

The Submasseteric space is the most common space infection, with a prevalence of 42.9%. The X-axis represents the involved space, and Y-axis represents the number of patients. Submasseteric space is the most common space infection with 27 cases.
(42.9%), followed by canine space infection in 21 cases (Graph 3).

The other spaces involved were canine, buccal, sub-mandibular and submental spaces. When VAS pain scores were assessed, patients have a higher score in 6.00 (38.1%), 8.00 (33.5%) and 9.00 (3.2%). The X-axis represents the Visual Analogue Scale (VAS), and Y-axis represents the number of patients. Majority of patients (n = 24, 38.1%) had a VAS Pain Score of 6.0 (Graph 4).

In correlation between odontogenic infection type and odontogenic infection source, pericoronitis with the source from 38 and 48 (mandibular third molars) are more frequent with p<0.05, showing a positive correlation between both. The X-axis represents the type of Odontogenic infection with its source, and Y-axis represents the number of patients. The Chi-square test was done, P-value=0.001, (P<0.05), which is statistically significant. There is an association between the source of origin of infection and the clinical presentation of the infection (Graph 5).

The correlation between odontogenic infection and space involved showed a significant finding with p-value <0.05, between pericoronitis and subsequent submasseteric space involvement. 26 cases from the study group developed trismus arising from pericoronitis. The X-axis represents the clinical types of odontogenic infection with the space involved in the patient, and Y-axis represents the number of patients. The Chi-square test was done, P-value =0.001 (<0.05), which is statistically significant. There is a significant association between the odontogenic infection and subsequent specific anatomic space infection. 26 patients with pericoronitis developed submasseteric space infection with trismus (Graph 6).

The correlation between odontogenic infection type and VAS pain score showed the highest frequency of VAS scored with a 6.0 score for 21 cases assessed and showed a positive correlation, p<0.05. The X-axis represents the type of Odontogenic infection with their pain scores, and Y-axis represents the number of patients. The Chi-square test was done, P-value =0.001 (P<0.05), which is statistically significant. There is a significant association between the clinical type of odontogenic infection and pain score (VAS) (Graph 7).

In this present study, the occurrence of odontogenic infection was analyzed and correlated with the odontogenic infection source, space involved, and pain score (VAS). The total sample size is 63 patients, between 17 and 70 years old.
In this study, 4 variables were assessed, which were odontogenic infection type, odontogenic infection source, space involved, and pain score (VAS). Chi-Square test showed that there were significant findings for all the variables (p<0.05). Pericoronitis with Submasseteric space infection showed the highest prevalence with a VAS score of 6.0 being most prevalent.

Very less literature is available, which correlates between the odontogenic infection and associated trismus onset. A study was done by Monasteri and Henriquez (2018) analysed 6992 for odontogenic infection, its prevalence, origin. The odontogenic infection characteristics and its complication were assessed in this study. The space involved based on gender were assessed. However, there was no specific finding on trismus as a complication. Out of the total samples examined, 60.1% of cases were associated with an odontogenic infection.

In the previous study done by Aloosi et al. (2017), in the Kurdistan-Iraq population with 60 patients, the common spaces involved form the odontogenic source of infection were submandibular (28.3%) and Infratemporal (28.3%) space respectively. The association between pericoronitis and submasseteric space involvement reported in our study is similar to the findings reported by Aloosi et al. (2017). The limitation of this present study can be improved
by increasing the sample size and broadening the sample size demographics and not just being a single institutional-based study. In the future, with the current knowledge of odontogenic infection and trismus, early diagnosis and early intervention to treat the odontogenic infection can decrease the life-threatening complications.

CONCLUSION

Within the limits of this study, a positive relation between odontogenic infection, subsequent involvement of Submasseteric, Submandibular space, and painful trismus were observed. Further multicentric study with a larger population, longer follow up with wider parameters needs to be done to firmly establish the correlations and association between odontogenic infection and trismus.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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