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INCIDENCE OF DENTAL CARIES IN THE MANDIBULAR 2ND MOLAR ASSOCIATED WITH IMPACTED MANDIBULAR 3RD MOLAR

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ABSTRACT

Background: A tooth is said to be impacted if it does not reach the occlusal plane even after two-thirds root formation. The aetiology of impacted teeth is varied and multifactorial. Significant problems associated with impacted teeth include trismus, infection, cervical caries of second molars. Impacted teeth may be non-functional, abnormal or pathologic and the etiology of impaction depends on several factors.

Aim: The aim of this study was to determine the incidence of dental caries in the mandibular 2nd molar associated with impacted mandibular 3rd molar.

Materials & Methods: A total of 2379 patients who were observed to have impacted mandibular 3rd molar were taken from April 2020 to March 2021.The data was collected from the patient management system. The data was collected and the analysis was done using SPSS by IBM version 23.

Results: Out of the 2379 patients who were observed to have impacted mandibular 3rd molar,67.21% of the patients had dental caries in the adjacent mandibular 2nd molar, whereas 32.79% had no dental caries. 55.40% of the patients were males and 44.60% were females.

Conclusion: Most of the patients who were observed to have impacted mandibular 3rd molar had dental caries in the adjacent mandibular 2nd molar. Out of the patients with dental caries in the mandibular 2nd molar, most of them were males.

Keywords: Mandibular 3rd molar, impaction, dental caries, mandibular 2nd molar,innovative technique

INTRODUCTION

Impaction occurs when a tooth fails to erupt into its anatomical position due to obstructions in the eruption path, poor tooth alignment, a lack of space, or other impediments(1). Teeth that are impacted are those that are unable to erupt into the dental arch in the appropriate time frame. The jaw is observed to have a higher incidence of impacted third molars than the maxilla.Mandibular third molars tend to erupt into the oral cavity after the age of 17years, and there is higher frequency in females than males(2).Third molars in the mandible are known to be related with a variety of diseases and can take on a variety of locations and angulations(3). Clinical and radiographic examinations aid in the classification of these teeth as well as the diagnosis of a variety of diseases. It may also have adverse effects on the adjacent tooth that are irreversible(4).

An impacted tooth is one that does not reach the occlusal plane even after two-thirds root development(5). Mandibular third molar teeth are the most often impacted teeth, according to the research. Due to the distal location of these impacted third molars in the arch and their frequent relationship with a pericoronal flap, this area is less accessible to oral hygiene(6),(7). One of the oldest and significant classification for impacted third molars is by Pell GJ and Gregory GT in 1933(8).

Furthermore, the pressure exerted on the second molars by the impacted third molars renders the second mandibular teeth more susceptible to distal caries(9). Plaque accumulates on the distal surface of the second molars in partially erupted mesioangular and horizontally impacted teeth, predisposing to distal cervical caries(10). The gingival edge recedes, exposing the cemento-enamel interface, which promotes bacterial accumulation and root caries along the distal surface of the second mandibular molars(11). With a mesioangular third molar, detecting distal caries in a second molar is more

challenging.When the caries involves the radicular portion of the second molar, the restorative procedure becomes very difficult and such teeth often end up in extraction(12). The second most common reason for impacted third molar removal is caries involvement of the lower second molar and/or third molar(13). The formation of distal cervical caries in the mandibular second molar is a long process that occurs over time and worsens with repeated oral cavity exposure(14).

One of reasons for development of distal caries in the second molar and the impacted tooth itself is the delay in seeking dental care. Even if the second molar is repaired, recurrent caries will occur if the impacted third molar is left untreated, speeding up the decay process and finally leading to tooth loss(15). Early extraction of impacted third molar teeth, early restorative operations involving second molars, and dental hygiene would all help to prevent the morbidity associated with second mandibular molars(16). Our team has extensive knowledge and research experience that has translate into high quality publications (17),(18),(19),(20),(21–30)(31),(32–34).(35,36).

MATERIALS AND METHODS

It is a single centered retrospective study conducted at Saveetha dental college and hospitals, Chennai. A total of 2379 patients who were observed to have impacted mandibular 3rd molar, predominantly South Indians, were included in the study. Ethical clearance was obtained from the International review board. The study was conducted from April 2020 to February 2021. Validation to the study was done by undergraduate, postgraduates and all faculty members of Saveetha dental college.

Data collection was done by using patient management software which has all patients records . It is a recording system of all patients of all data related to the medical and dental history of patients and treatment done in Saveetha dental college. The collected data was tabulated under the following parameters - name, age, gender and presence of dental caries. The main variables included are the presence of dental caries, age and gender.

The data analysis was performed using SPSS software (version 23). The chi square test and pearson correlation was done. The chi square test was used to compare the data and checked for the distributions at 0.05 level of significance for effect of statistical significance.

RESULTS AND DISCUSSION

The data collected from the digital archives was tabulated, imported to SPSS and descriptive statistics was performed. Out of 2379 patients, the age of 59.98% of the population ranged from 20 to 30yrs , 25.98% of them belonged to the age group of 31 to 40yrs, 7.57% from 41 to 50yrs, 4.75% were below 20yrs and 1.72% of the population were above 50yrs of age group(Figure 1). 55.40% of the study population who were observed to have impacted mandibular 3rd molar were males and 44.60% were females(Figure 2). Out of the entire study population, 67.21% of the study population had dental caries in the adjacent mandibular 2nd molar and 32.79% of them did not have any dental caries in the mandibular 2nd molar(Figure 3).

An association was done between age groups and incidence of dental caries in the mandibular 2nd molar. Out of 67.21% of the patients with dental caries in the mandibular 2nd molar, 56.12% were from 20 to 30yrs age group, 3.95% of the population below 20yrs, 3.15% from 41 to 50yrs, 2.86% from 31 to 40yrs and 1.13% of them were above 50yrs of age group. Out of 32.79% of the patients who did not have dental caries in the mandibular 2nd molar, 23.12% were from 31 to 40yrs, 4.41% from 41 to 50yrs , 3.87% from 20 to 30yrs, 0.80% of them were below 20yrs and 0.59% of them were above 50yrs (Figure 4). The p value was found to be 0.00 which is statistically significant.

A study given by Altiparmak Nur, et.al, 2017 is in consensus with the present study. It states that compared to other parameters, age is not a criteria that increases the prevalence of distal caries lesions in mandibular 2nd molars, as the patients are between 20 to 30 years, with a mean age of 25.6.The study also hypothesize that horizontal and impaction degree of mandibular 3rd molars can increase food packing and plaque retention on the distal surface of the mandibular 2nd molars which in turn cause dental caries.

Crosstabs were done between gender and incidence of dental caries in the mandibular 2nd molar. Out of 67.21% of the patients with dental caries in the mandibular 2nd molar, 36.57% of them were males and 30.64% were females. Out of 32.79% of the patients who did not have dental caries in the mandibular 2nd molar, 18.83% were males and 13.96% were females(Figure 5). The p value was found to be 0.00 which is statistically significant.

A study given by Nikhil Srivastava, et. al, 2017 (37), states that among 200 impacted molars examined, most of them were present in patients in the second decade of life where 55% were male and 45% female patients. This study is in consensus with the present study. A study given by Kamran bhokari. S, et.al, 2017, (38), states that the depth of the impacted third molar and the occlusal angulation between the impacted tooth and the occlusal surface of the second molar influences the distal caries in the second molar. They stated that the second molars adjacent to absent third molars were at

the lowest risk for developing pathology; whereas, second molars adjacent to soft tissue impacted third molars were at greatest risk.

In this retrospective study, dietary and nutritional patterns of the patient, smoking, medical conditions (such as diabetes), were not recorded. Nevertheless, within the limitations of the present study, it can be said that there is a higher incidence of dental caries in the mandibular 2nd molar associated with the impacted mandibular 3rd molar.

Figure 1- Bar graph depicting the age of the study population who were observed to have impacted mandibular 3rd molar. Red colour denotes below 20yrs, Orange colour denotes 20 to 30yrs, Yellow colour denotes 31 to 40yrs, Purple colour denotes 41 to 50yrs and Green denotes above 50yrs of age group. X axis indicates the age of the study population and Y axis indicates the percentage of the study population.

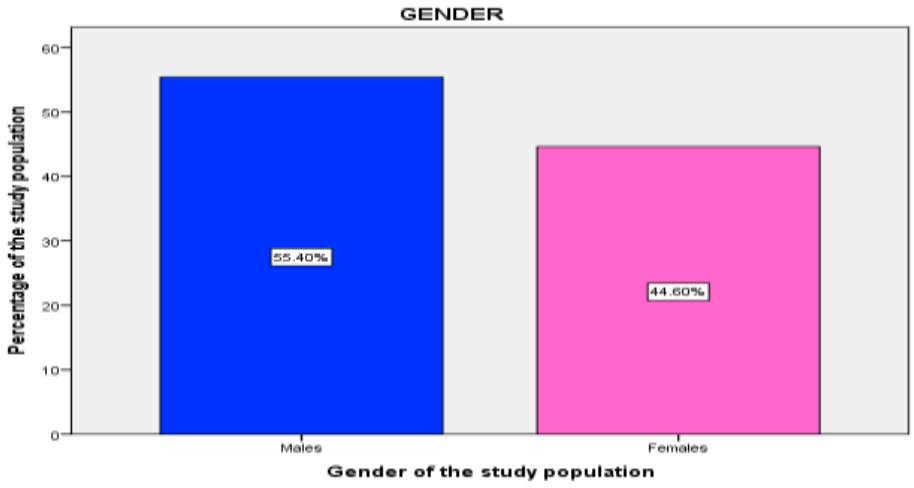

Figure 2- Bar graph depicting the gender of the study population who were observed to have impacted mandibular 3rd molar. Blue colour denotes Males and Pink colour denotes Females. X axis indicates the gender of the study population and Y axis indicates the percentage of the study population.

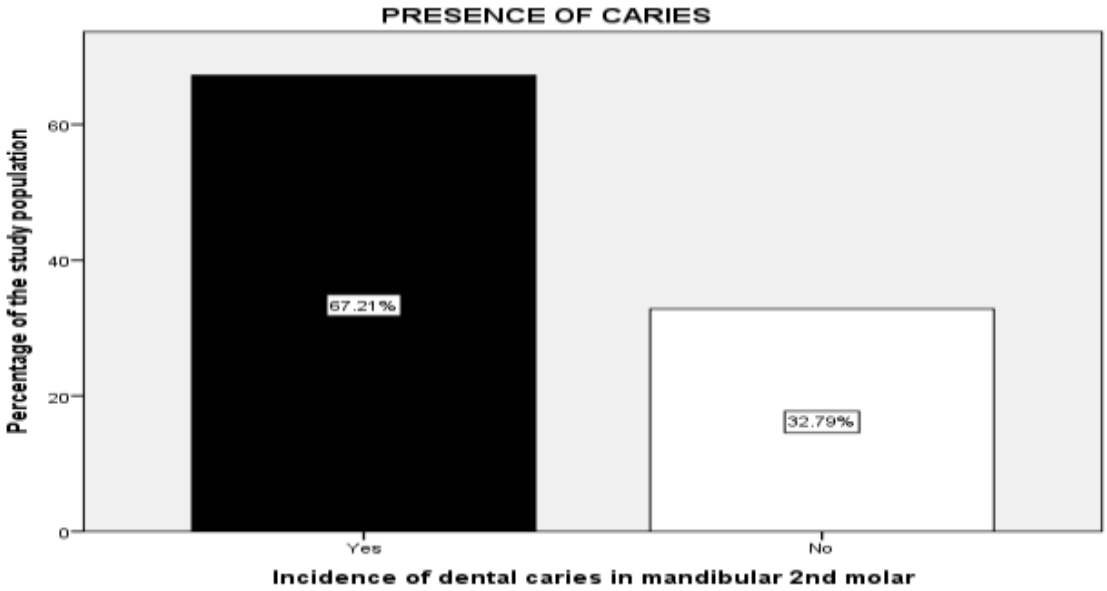

Figure 3- Bar graph depicting the incidence of dental caries in the mandibular 2nd molar of the study population who were observed to have impacted mandibular 3rd molar. Black colour denotes presence of dental caries and White colour denotes absence of dental caries in the adjacent mandibular 2nd molar. X axis indicates the gender of the study population and Y axis indicates the percentage of the study population.

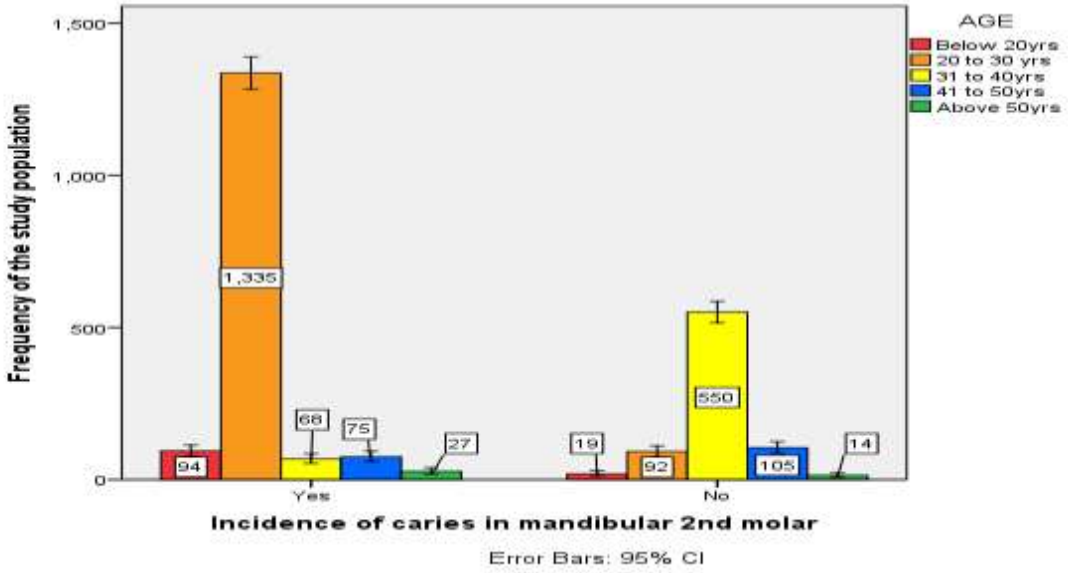

Figure 4- Bar graph depicting the association between age of the study population and the incidence of dental caries in the mandibular 2nd molar. Red colour denotes below 20yrs, Orange colour denotes 20 to 30yrs, Yellow colour denotes 31 to 40yrs, Purple colour denotes 41 to 50yrs and Green denotes above 50yrs of age group. X axis indicates the incidence of dental caries in the mandibular 2nd molar and Y axis indicates the percentage of the study population.

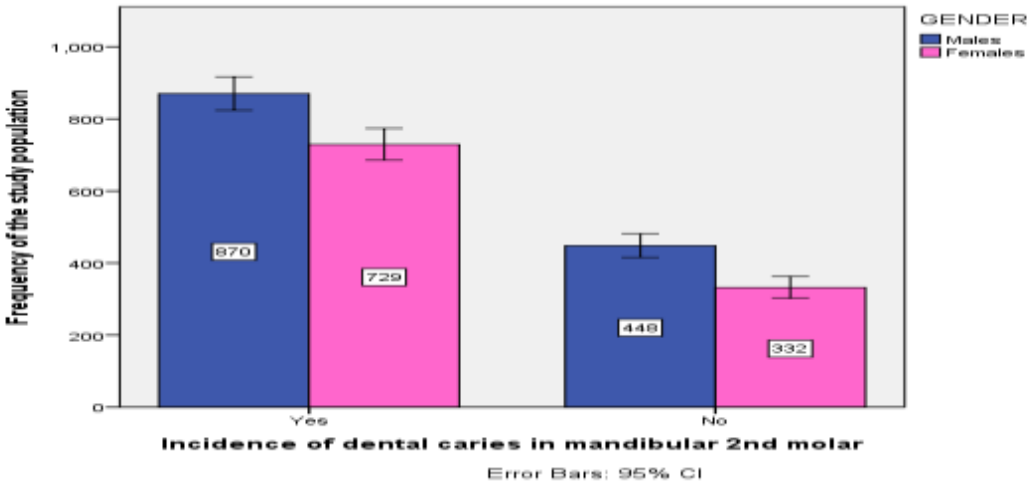

Figure 5- Bar graph depicting the association between gender of the study population and the incidence of dental caries in the mandibular 2nd molar. Blue colour denotes Males and Pink colour denotes Females. X axis indicates the incidence of dental caries in the mandibular 2nd molar and Y axis indicates the percentage of the study population.

CONCLUSION

The incidence of dental caries in mandibular 2nd molars was significantly higher when the highest portion of the impacted mandibular 3rd molars were observed.

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CONFLICT OF INTEREST

None to declare

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