

## Age And Gender Related Distribution Of Patients Undergoing Mandibular Third Molar Extractions- A Retrospective Study

Research Article

Sam John Koshy<sup>1</sup>, Madhulaxmi M<sup>2\*</sup>, Sivakuma M<sup>3</sup>

<sup>1</sup> Department of Oral & Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai - 600 077, TN, India.

<sup>2</sup> Professor, Department of Oral & Maxillofacial Surgery, Saveetha Institute of Medical and Technical Sciences, Saveetha University, 162, Chennai - 600077, Tamil Nadu, India.

<sup>3</sup> Senior Lecturer, Department of Oral & Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences (SIMATS) Saveetha University, Chennai, India.

### Abstract

Mandibular third molars are the most common teeth requiring removal for prophylactic or symptomatic reasons. It is important to be able to judge and choose the appropriate surgical approach for treating third molars requiring removal from the oral cavity- Whether it needs a trans alveolar or intra alveolar approach. The aim of this study is to determine the frequency of mandibular third molars undergoing intra alveolar extraction and its correlation to age and gender of the patient. This is a single centre retrospective study done from June 2019 – March 2020. The study samples were collected from a pooled patient data of 21000 patients. Based on the set inclusion and exclusion criterias, 1683 patients who underwent extraction of their mandibular third molars were considered. The parameters were examined and processed with relevance to the extracted mandibular third molar teeth on the basis of age and gender of the patient. IBM SPSS Version 20 was used for statistical analysis. Out of a total of 1683 patients considered for mandibular third molar extraction, the most prevalent age group was 21-30 years of age (25.1%). 45% were over 30 years to 50 years of age and interestingly 28.1% were over 50 to 90 years of age. Out of a total of 1682 patients, (51.2%) 862 patients were female patients and (48.8%) 820 patients were male patients More than half the total patients considered required extraction of mandibular third molars on the left side (52.6%). The correlation of age and gender on the mandibular third molar seems statistically insignificant as  $p=0.926 > 0.05$  and  $p=0.520 > 0.05$  respectively. This study concludes to establish that though the predominance of mandibular third molar extractions arise in the age group of 21-30 years, they made only one quarter of the total sample population. The overall majority of patients requiring mandibular third molar extraction among our population were over 30 years of age. Gender predilection was females over males in our population.

**Keywords:** Third Molar Extraction; Impaction; Complication Of Third Molar Extraction.

### Introduction

Exodontia according to Geoffery L. Howe is defined as the painless removal of the whole tooth, or root, with minimal trauma to the investing tissues, so that the wound heals uneventfully and no postoperative prosthetic problem is created.[1] The rate of extraction when compared to other teeth is higher for third molars. This is mostly due to the inadequate space between the distal of the second mandibular molar and the anterior border of the ascending ramus of the mandible.[2]

Environmental factors, systemic diseases, genetic polymorphisms, dietary habits and masticatory function can play an etiological role in the occurrence of dental anomalies related to mandibular third molar eruptions. Agensis has been reported as the most frequently occurring dental anomaly.[3] Literature has depicted mandibular third molars to be congenitally missing in 58.02% patients.[4] The rate of impacted mandibular third molar teeth is about 73% of the young adults in Europe. [5] Similar studies conducted around the world have substantiated the same result from their studies. [6] Teeth may remain asymptomatic or may be associated with vari-

#### \*Corresponding Author:

Madhulaxmi M,  
Professor, Department of Oral & Maxillofacial Surgery, Saveetha Institute of Medical and Technical Sciences, Saveetha University, 162, Chennai - 600077, Tamil Nadu, India.  
Tel: +91 7373814000  
E-mail: madhulaxmi@saveetha.com

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ous pathologies such as caries, pericoronitis, cysts, tumors, and also root resorption of the adjacent tooth.[2] It is more questionable to judge the clinician's aptitude on the requirement of extraction of mandibular third molar prophylactically or for symptomatic reasons. It is important to be able to judge and choose the appropriate surgical approach for treating third molars requiring removal from the oral cavity- Whether it needs a trans alveolar or intra alveolar approach. Our population have addressed the need for extraction of teeth only after the commencement of symptoms associated with pain and swelling of the tooth.[7] However, prophylactic or asymptomatic extraction of third molars are practiced around the world for its benefits of reduced chances of incidence of pathology, prevention of anterior crowding and displacement and elevated chances of infections.[8]

Clinicians are often confused due to the lack of statistical evidence on third molar extraction principles and requirement of approach because of specific indications, benefit-risk ratios and timing for the procedures are estimated only by clinical impressions and statistically proven clinical findings.[9] Till date, the institutional team of research has conducted several clinical trials,[10-15] in-vitro studies [16], and awareness surveys [17-25] in the field of Oral and Maxillofacial Surgery. Hence, a retrospective epidemiological setup is used for this study in order to highlight the differences in trends among the population. Previously our team has a rich experience in working on various research projects across multiple disciplines [26-39].

This study was conducted to determine the frequency of mandibular third molars undergoing extraction and its correlation to age and gender of the patient.

## Materials And Methods

Clinical records of patients who underwent third molar extraction from the Department of Oral and Maxillofacial Surgery, between June 2019 and April 2020 were retrieved for this study. Radiographs and clinical records were comparatively evaluated in this study. Institutional ethical clearance was obtained for data retrieval and usage as required for the study (SDC/SIHEC/2020/DIASDATA/0619-0320)

A total of 1706 patients with cross reference and verification using photographic, radiological and telephonic re verification of data were examined for the elimination of errors which could've aroused in the course of the study. Patients who underwent extraction of mandibular third molar teeth with preference to the availability of data of age, gender, availability of radiographs (IOPA/OPG), and follow up reviews were considered in the study. Inclusion of all available data with no sorting process has helped minimize sampling bias and stating applicable validity to the study.

Data was collected from the patient information archives. Patient data with absence of tooth number, patients under the age of 18 and patients with impacted third molars were excluded from the study.

Out of a total of 1706 patients considered for the study, 23 were excluded based on the exclusion criteria. A total of 1683 patients were considered in this study. All extraction procedures were done

with standard surgical protocol and prophylactic antibiotic and analgesic treatment modalities. Data were collected and verified by an external examiner and the statistical evaluation was done using IBM SPSS version 20.

With the dependent variables being age and gender and Independent variable being the extracted tooth, the statistical test of correlation 'chi-square' test was used to obtain the analysis of correlation and association in consideration. All results underwent statistical analysis at a confidence interval of 95%.

## Results And Discussion

Out of a total of 1706 patients considered, 23 patients were excluded from the study as 14 patients did not have a radiograph for evaluation, 9 patients whose tooth number were not mentioned. Out of the considered 1683 samples, according to age, 423 (25.1%) belonged to the age group of 21-30 years, 394 (23.4%) belonged to the age group of 31-40 years, 363 (21.6%) in the age group of 11-20 years, 472 patients (28.1%) belong to the age group of 51-90 years. [Figure 1]

In consideration of the gender, out of the total 1683 patients included in the study, 862 patients (51.2%) were female whereas 820 patients (48.7%) were male and 1 patient was transgender. [Figure 2]

On evaluation of the tooth and quadrant of predominance, 885 patients (52.6%) had undergone extraction of mandibular third molar of the left side (38) and 798 patients (47.4%) had their third molar on the right side extracted (48) [Figure 3].

On correlation of age and gender on the extracted mandibular third molar, all age groups showed a definitive association of prevalence to the left side (38) by 52.6%. However, on considering the age group of 51-60 years, it showed an increase in the rate of mandibular third molar extraction of the right side more prevalent seems statistically insignificant as  $p=0.926>0.05$  [Figure 4]. Third molar extraction continues to be a topic of controversy when it comes to defining its indications among dentists and oral and maxillofacial surgeons.(8). Many authors in literature have found no evidence to support or refute removal of third molars to prevent health related complications. Mettes et al over an extensive study has found no statistical evidence to rightly support or deny that removal of third molars prevents health complications which stands to conceive the concept of prophylactic extraction of teeth. [40]

Growth and development of the jaws and teeth are widely influenced by the Information on the timing and sequence of tooth eruption. Studies have proven to determine the chronological age of children and adults based on bone maturity, rate of development of bone (jaws) and by tooth development and eruption.[41]. Many studies have proved that the mean age of having clinically completely erupted mandibular third molars was 21.49 years in male subjects and 23.34 years in female subjects. [41]. Mean age of mandibular third molar eruption does have demographic variations. Olze et al in his study on Japanese population has stated the average age of eruption of the mandibular third molar is 20.7–22.9 years in women and 19.2–22.1 years in men. [42] He further analyzed mandibular wisdom tooth eruption in African

Figure 1. Pie chart showing percentage of incidence of mandibular third molar extractions based on different age groups. Patients within age group 21-30 years showed the highest incidence rate (25.13% )(green color).

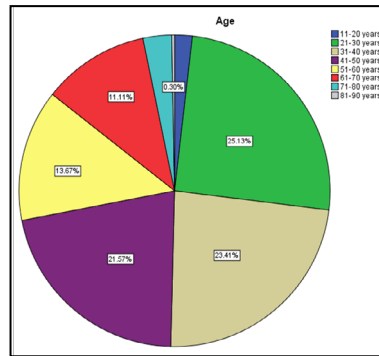


Figure 2. Pie chart showing percentage of incidence of mandibular third molar extraction based on gender of the patient. Incidence in females (represented by blue colour) were more than half of the study population (51.22%).

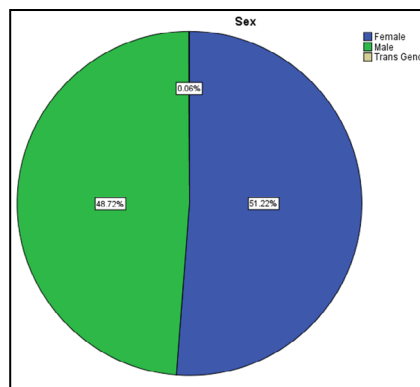


Figure 3. Pie chart showing percentage of incidence of mandibular third molar extractions based on the side of extraction.. Most commonly extracted tooth was on the left side, 38 (52.58%)(represented by blue).

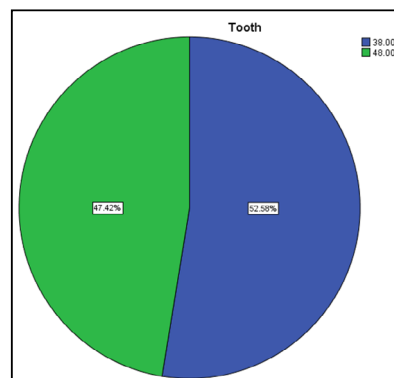
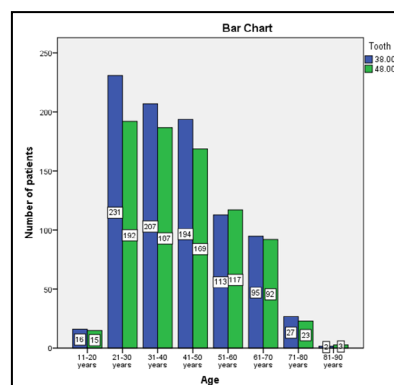


Figure 4. Bar graph showing association between age and the mandibular third molar tooth extracted. X axis denotes the mandibular third molar extractions in different age groups of patients; Y axis denotes the frequency of extractions done; Majority of the extractions occurred in the age group of 21-30 years(25.1%) with more common extractions to the left side(blue)(54.6%) than the right side(green)(45.4%) followed by the age groups of 31-40 years(23.4%). However the association was statistically not significant (Chi square test, p value- 0.926 > 0.05- statistically not significant).



population and have stated the median ages of third molar eruption to be 20.36 and 20.29 years.[43] His study among the German population and their eruption sequence of mandibular third molar probable age of gingival emergence was 20.2–20.6 years in women and 21.4–22.8 years in men.[44]. Coratian population showed the eruption age to be 21.6–21.8 years according to the study conducted by Hrvoje Brkić et al.[45] Studies of the chronological course of third molars eruption in a northern Chinese population by Yu-cheng Guo et al has proved the eruption age of mandibular third molars to be 21.67 and 21.87 among male and female population respectively [46]. The eruption sequence of the Canadian population on having studied upon by Thevisen et al has proved to be 20.2 years [47]. The Turkish population, according to the study conducted by Sisman et al, showed an average age of 22.10 and 22.60 in males and females respectively for the eruption of mandibular third molars [48]. Kutesa et al, on his study on the Ugandan population stated the average age of eruption of lower third molars to be 20 years of age [49]. These studies were in accordance with the result obtained from this study proving an increased prevalence of cases bound for extraction of mandibular third molar occurs in the age group of 21–30 years. [50].

In comparison to all the other studies, this study has proved that 45% of patients who required extraction of mandibular third molar were over 30 years to 50 years of age and interestingly 28.1% were over 50 to 90 years of age. Many studies have also stated that extraction of mandibular third molars were inevitable in population accounting for the age group of 30–50. [51]. However, not many studies have proven the presence of a need pertaining to extract mandibular third molars in an age group of over 50–90 years of age. The reason for delayed extraction or symptomatic extraction of mandibular third molars stand due to both social and personal behavioral and systemic factors of the patients. Systemic factors such as osteoporosis and Osteopenia are conditions characterised by the reduction in bone mineral density which directly affects the need for extraction of the third molar. [52]. Other systemic causes include compromised medical history including diabetes and other systemic conditions prevail in establishing a delayed age for the extraction of tooth in our population.[53] Clinical factors include increased post operative recovery time, complications including fracture tendency, delayed healing and complications. Social factors include lack of awareness and interest of people to the importance of oral health, lack of insurance and government aided help for treatment principle coverage and lack of beneficial and supportive health promotive systems in our society.

The debatable and disputable choice is the reason for extraction of mandibular third molars. The Indian population addresses the need for extraction of teeth only after the commencement of symptoms associated with infection such as pain and swelling of the tooth to an extent of unbearable and unprocastinable distress.[7] However, prophylactic or asymptomatic extraction of third molars are practiced around the world for its benefits of reduced chances of incidence of pathology, prevention of anterior crowding and displacement and elevated chances of infections [8]. When compared to the reasons supporting extraction, There is less agreement about reasons to retain mandibular third molars. Ventä et al in his literature has stated that there are only two contraindications to removal: (1) an unerupted, disease-free, symptomless third molar totally covered with bone, and (2) when removal constitutes an unreasonable risk to the general or local

health of the patient.[54]. Judging with the limited literature available and the clinicians experience, Bruyn et al has proposed eight categories that capture the different reasons for retaining third molars. These categories included (1) risk of damage to adjacent structures, (2) compromised health status, (3) adequate space for eruption, (4) third molar serving as an abutment tooth, (5) orthodontic reasons, (6) eruption into proper occlusion, (7) symptomless third molars in patients over 30 years old, and (8) patient preferred to decline the suggested treatment. [55].

Many have studied the attitude of patients to the needed treatment both prophylactically and symptomatically and the patients response to the need of the treatment. Alfadil et al in his study has proved that 67% of the patients required a prophylactic or asymptomatic need for the extraction of the third molar, out of which 98.8% patients refused the treatment. [56] This lack of interest and non compulsive attitude to the oral cavity and dental treatments have brought the slackness and unimportance to the treatment of the oral cavity which this research highlights.

Disease status is of importance to identify the cause and its clinical relevance for mandibular third molar extractions. Investigators in numerous studies have discussed the epidemiology and management of asymptomatic third molars. The term “asymptomatic” is an insufficient description of the clinical status of the third molar. [57] The ability to distinguish the need and choice of extraction for symptomatic and asymptomatic or prophylactic extraction stands in the understanding with statistical evidence of the surgeon. Symptomatic causes for the extraction of mandibular third molar are many. They include Pericoronitis, Dental Caries and Infections. Pericoronitis is a mild to moderate inflammatory response of soft tissues surrounding a partially erupted tooth or erupted tooth. According to Rakprasitkul et al, 25 to 30 percent of third molars are extracted because of acute or recurrent pericoronitis.[58] Difficulty in reaching the region to maintain adequate oral hygiene is a major cause for dental caries in patients. According to Nordenram et al, caries account for 15 percent of third-molar extractions.[59] Local or systemic causes that lead to pulpal necrosis can result in a localized or spreading fascial space infection. 29 percent of third molar patients who have undergone extraction have shown a history of pertaining infections [60]. Age of developmental completion of the tooth along with symptomatic and asymptomatic relevance for extraction of mandibular third molar tooth has pushed the prevalence of extraction to an age group above 30 years [61].

Extraction of mandibular third molar at a delayed age holds both beneficial and at the same time may lead to many complications. The four most common postoperative complications of third molar extraction reported in the literature are localized alveolar osteitis (AO), infection, bleeding, and paresthesia.(2). Factors thought to influence the incidence of complications after third molar removal include age, gender, medical history, oral contraceptives, presence of pericoronitis, poor oral hygiene, smoking, relationship of third molar to the inferior alveolar nerve, surgical time, surgical technique, surgeon experience, use of perioperative antibiotics, use of topical antiseptics, use of intra-socket medications, and anesthetic technique. [61–72] Our institution is passionate about high quality evidence based research and has excelled in various fields [73–83].

Preventive removal of mandibular third molars at a young age

is justified in literature because retained mandibular third molars are at high risk of developing various pathologies and infections. In addition, at older ages extraction of mandibular third molars becomes more complex, with an increased rate of complication due to deteriorated systemic physiologic conditions and changes in bone physiology. [84, 85].

## Conclusion

This study concludes to establish that though the predominance of mandibular third molar extractions arise in the age group of 21-30 years, they made only one quarter of the total sample population and the overall majority were over 30 years of age. Gender predilection was females over males in our population. The most common extracted third molar tooth was of the left side with a correlation to age and gender of the patient.

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