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Prevalence and Distribution of Unerupted/Impacted Teeth Among Individuals 18-25 Years of Age Visiting Outpatient Department of Private Dental College and Hospital in Chennai, India

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Abstract

The term unerupted / impacted teeth defines a failure of the tooth to erupt within the expected time into the dental arch. Impaction is a common dental anomaly where the tooth has not erupted beyond the eruption period. The incidence of unerupted / impacted teeth differs among different populations and in different ethnic groups. The aim of this study was to assess the prevalence of unerupted/ impacted teeth among patients of 18-25 years of age visiting Private Dental college and hospital, Chennai. This is a descriptive study which is performed under a university setting where all the patients reported to Private Dental college and hospital, chennai. The data was collected by reviewing patients records and analysed the data of 86000 patients who underwent extraction between June 2019 to March 2020. The population size of the study was found to be n=296 .Data was collected , tabulated ,statistical analysis was done by SPSS – IBM.(Statistical Package for Social Studies)**.** From the statistical analysis, it is observed that the total number of extraction done between 18-25 years was found to be n=7339 (96%) out of which only n= 295 (4%) was found with an incidence of impaction. The overall prevalence of unerupted/ impacted teeth were higher in males(55.74%) predominantly between the age groups of 24 years (18.8%) and was commonly reported to third molars (41.9%)**.** Within the limitation of the current study, it is found that unerupted / impacted teeth are more common among 24 years of age with male predilection with higher incidence of mandibular molars.

Keywords : *Unerupted tooth , extraction , Type of impaction, frequency of impaction, site of impaction.*

Introduction

The word impaction originated from the Latin word “impact” meaning organ or structure, William stated that impacted tooth is the one which is completely or partially unerupted beyond the eruption period[1]. The term unerupted tooth defines a failure of the tooth to erupt within the expected time into the dental arch and positioned against another tooth, bone, or soft tissue so that its further eruption is disrupted beyond the time usually expected eruption time [2] . The failure of eruptions may be due to systemic and local factors ,which includes cleidocranial dysplasia, Down’s syndrome, and also deficiency of arch length[3,4]. The incidence of unerupted / impacted teeth differs across different populations and different ethnic groups [5,6]. The causes of impaction may be multifactorial usually due to adjacent teeth, dense overlying bone or soft tissue, size of the mandible or maxilla , lack of space in the jaw and the path of eruption, abnormal positioning of tooth bud, or due to any pathological lesions [7,8] . There is a correlation

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between the development of cystic lesions, pericoronitis ,and dental caries with unerupted /impacted teeth [9] .

Some dental surgeons believe that unerupted/ impacted teeth should be removed except, in certain cases like canines [10]. Usually canines may just remain and do not cause any further problems[11]. Thus surgical intervention is not required [12,13]. However, removal of asymptomatic, pathology-free, unerupted / impacted teeth isn't a medical consensus [14,15.] The classifications of impaction enables the oral surgeon to determine the difficulty in removal of the unerupted / impacted teeth. The primary factor in determining the difficulty is accessibility that is determined by adjacent teeth or other structures which paves a way for the teeth to erupt[16]. The majority of classification systems are based on analysis on a radiograph [17,18]. The most frequently considered factors are site of impaction ,type of impaction and severity of impaction .[19]

In most of the studies the impaction rate is higher for third molars when compared with other teeth [20]. The cause is due to inadequate space between the distal surface of the second mandibular molar and anterior border of the ascending ramus of the mandible [21]. However, recently there is no literature regarding incidence and prevalence of unerupted/ impacted teeth [18,22]. The purpose of this study can help to achieve more relevant information of many factors such as gender, age , systemic disease , site of impaction , angulation , severity, type and prevalence of impaction. Thus , The aim of this study was to assess the prevalence of unerupted/ impacted teeth among 18-25 years of age visiting Private dental colleges and hospitals, Chennai, India, by assessing demographic and morphologic factors that can lead to the condition .

Materials and Methods

This was a descriptive study which was performed under a University setting where all the patients between 18-25 years of age reported to Private Dental College and hospitals, Chennai , India. The data was collected by reviewing the patients records and analysed the data of 86000 patients who underwent extraction between June 2019 to March 2020. The ethical approval was obtained from the Institutional Ethical Committee(ethical approval number : SDC/SIHEC/2020/DIASDATA/0619-0320). The population size of the study who underwent extraction due to unerupted/impacted teeth was found to be n=296. The data was cross verified with photographs and was compiled for statistical analysis on SPSS(version 22.0) software. The minimising sampling bias was done by collecting data within the University and by using the simple random sampling method . There was a high internal validity and low external validity in our study. The patients between 18-25 years of age and the patients who underwent extraction due to impacted /unerupted teeth were included in the study. Improper and incomplete data ,repeated data ,extraction done for other reasons were excluded. Chi square test was used to compare the groups ($p<0.05$) was considered significant and the results were interpreted .

Results and Discussion

In the current study , The total number of extraction done among 18-25 years of age was found to be n=7339 (96%). Out of which only n= 296 (4%) was found with an incidence of an unerupted / Impacted teeth. [Figure 1] represents the distribution of study subjects with unerupted / Impacted teeth. [Figure 2] denoted the prevalence and distribution of unerupted / impacted teeth among different age groups. The result of our study showed unerupted / impacted teeth were more prevalent among 24 years of age (18.8%). [Figure 3] represented the prevalence of gender in relation to unerupted / impacted teeth. The total subjects of unerupted / impacted teeth examined were n=296(4%) of which males constituted (55.74%) and females (44.26%). In our study the most commonly associated chief complaint was found to be the presence of pain (84.98%) followed by absence of pain (14.68%) and presence of discharge (0.31%). Nearly (11.82%) of the patients presented with past medical history. Nearly (1.69%) of patients had swelling at the site of impaction .[Figure 4]denoted the prevalence and distribution of unerupted / impacted teeth in individuals of different tooth numbers,of which mandibular third molars showed higher prevalence (41.9%)than maxillary third molars. The total number of impaction was found to be more prevalent in the third quadrant with a common type being mesioangular (38.31%) [Figure 5]. By correlating age, gender, and tooth number males showed more prevalent on unerupted / impacted teeth than females but both males and females showed equal predilection for mandibular third molars with a mean age of 24 years [Figure 6]. Chi square tests for age, gender, tooth number was found to

be statistically significant (p=0.00).

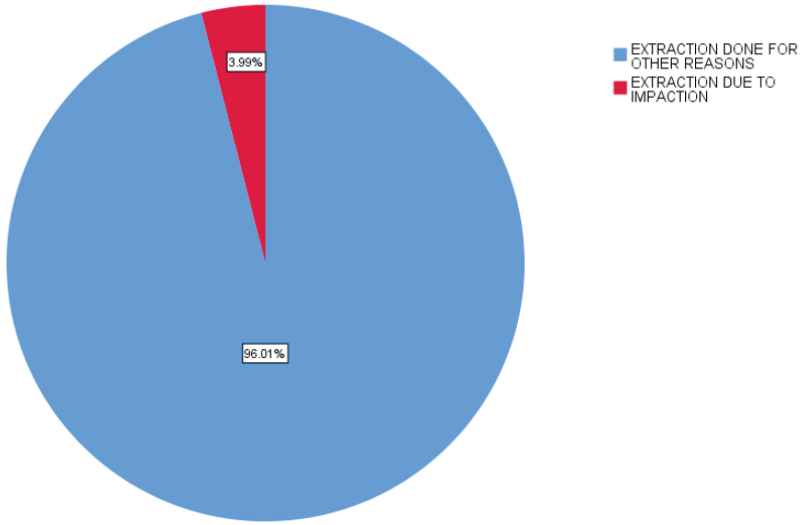

Figure 1 : Pie chart depicting the Prevalence and Distribution of Unerupted / Impacted Teeth Among 18-25 Years of Age Visiting Private Dental College and Hospital in Chennai . Blue colour denotes extraction done for other reasons. Red colour denotes extraction done for impaction. Extraction done for other reasons among 18-25 years of age was found to be(96%) and the extraction done due to impaction was found to be (4%) . (Chi Square test ; p value =0.00 ; p<0.05; hence significant).

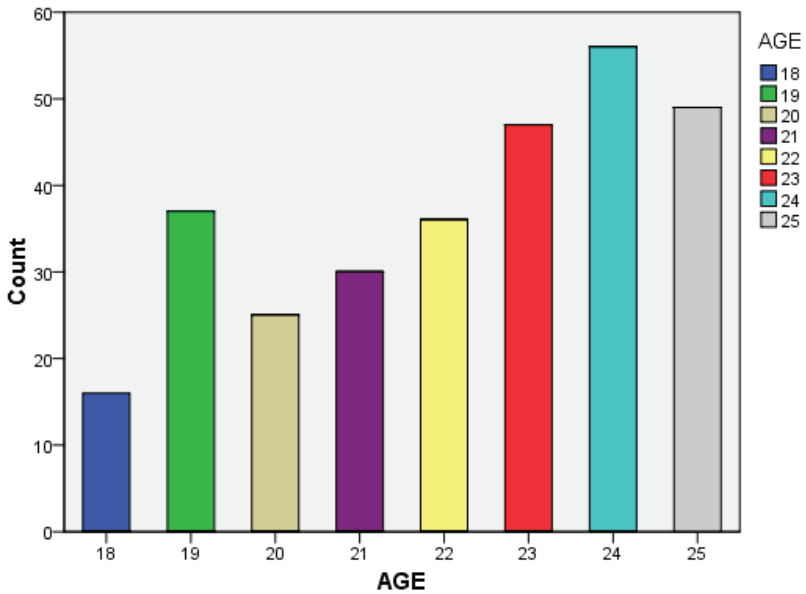

Figure 2 : Bar graph depicting the Prevalence and Distribution of Unerupted / Impacted Teeth Among Different Age Groups Visiting Private Dental College and Hospital in Chennai The graph has been plotted with the frequency taken on the scale from 0-60 on y -axis representing the unerupted / impacted teeth .The age of patients who underwent extraction for unerupted / impacted teeth is plotted on the scale 0-25 along x-axis .Blue colour denotes 18 years of age . Green colour denotes 19 years of age . Brown colour denotes 20 years of age .violet colour denotes 21 years of age . Yellow colour denotes 22 years of age . Red colour denotes 23 years of age .light blue colour denotes 24 years of age . Grey colour denotes 25 years of age . It is evident that the prevalence of Impacted / Unerupted teeth was more common in patients of 24 years of age. (Chi Square test ; p value =0.00 ; p<0.05; hence significant).

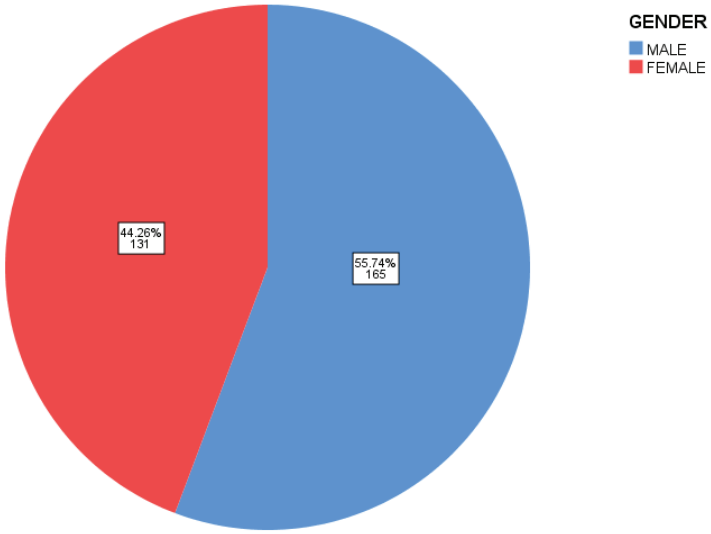

Figure 3 : Pie chart depicting Prevalence and Distribution of Unerupted / Impacted Teeth Among Different Genders Visiting Private Dental College and Hospital in Chennai . Blue colour denotes males. Red colour denotes females. Pie chart shows that Unerupted /Impacted teeth were higher in males . (Chi Square test ; p value =0.04 ; p <0.05; hence significant).

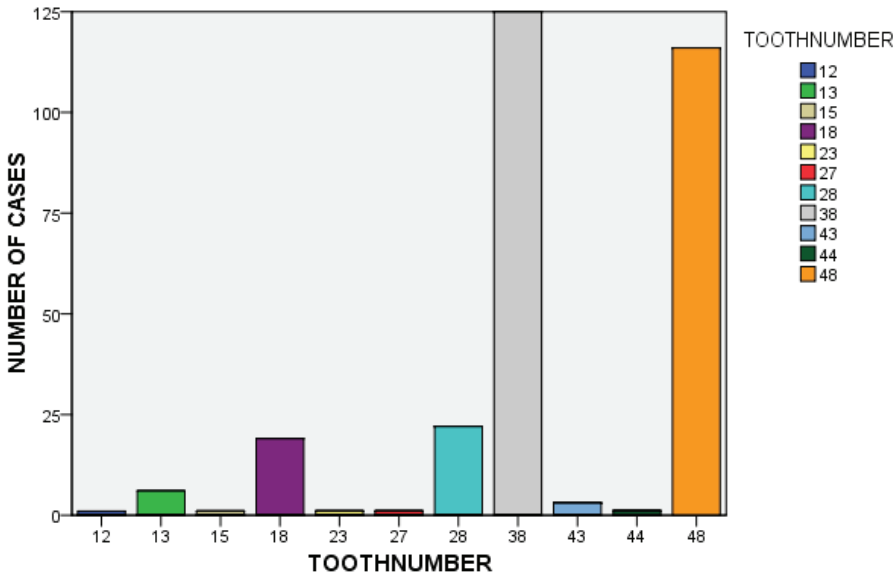

Figure 4: Bar graph depicting the Prevalence and Distribution of Unerupted / Impacted Teeth in Different Tooth Numbers in Individuals Among 18-25 Years of Age Visiting Private Dental College and Hospitals in Chennai. The frequency of unerupted /impacted teeth is plotted on scale 0-125 along y axis. The frequency of tooth number is plotted on the x-axis. Blue colour denotes the tooth number 12. Green colour denotes the tooth number 13. Brown colour denotes the tooth number 15. Violet colour denotes the tooth number 18. Yellow colour denotes the tooth number 23. Red colour denotes the tooth number 27. Light blue colour denotes the tooth number 28. Grey colour denotes the tooth number 38. Purple colour denotes the tooth number 43. Dark green colour denotes the tooth number 44. Orange colour denotes the tooth number 48. The prevalence of unerupted / impacted teeth was most frequently found in the lower left 3rd molar. (Chi Square test ; p value =0.00 ; p<0.05; hence significant).

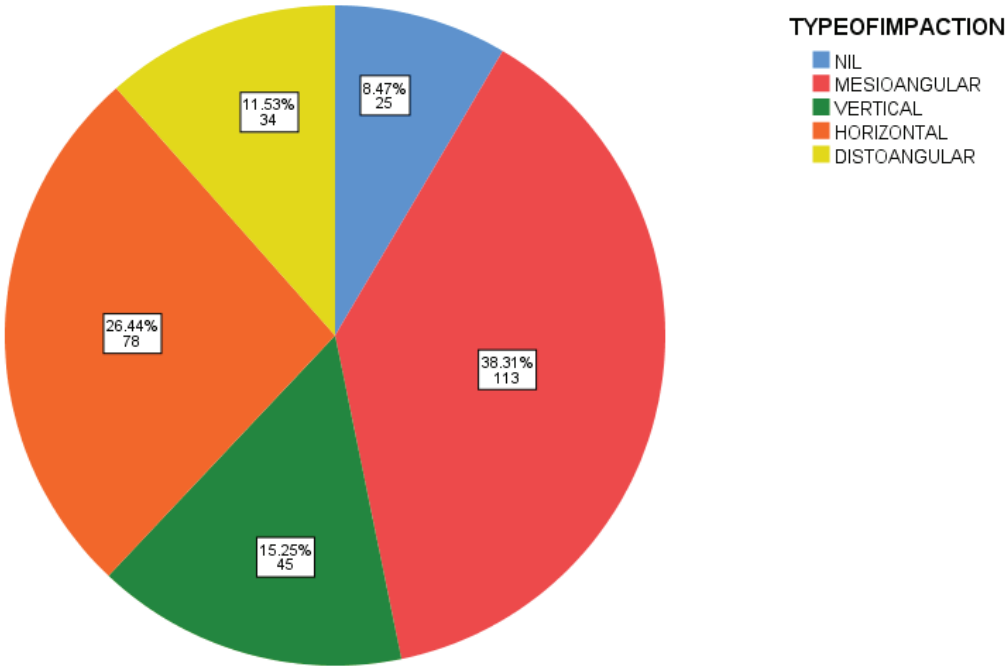

Figure 5: Pie chart depicting the assessment of type of impaction among patients who underwent extraction for unerupted / impacted teeth in Private Dental Colleges and Hospitals in Chennai. Red colour denotes Mesioangular type of impaction. Yellow colour denotes a distoangular type of impaction. Green colour denotes vertical type of impaction. Orange colour denotes horizontal type of impaction. Blue colour denotes absence of any type. Mesioangular was the most commonly found type of impaction among the patients with impacted /unerupted teeth . (Chi Square test ; p value =0.00 ; p<0.05; hence significant).

Figure 6 : Bar graph depicting the Correlation of Age,gender and Tooth Number of Patients Who Underwent Extraction for an Unerupted / Impacted Teeth in Private Dental Colleges and Hospitals in Chennai. The graph has been plotted with the frequency of mean age taken on the scale from 0-25 on y -axis and tooth number on x-axis. Blue colour denotes males. Red colour denotes females. It is evident that males showed more prevalent on unerupted / impacted teeth than females but both males and females showed equal predilection for mandibular third molars with a mean age of 24 years.(Chi Square test ; p value =0.00 ; p<0.05; hence significant).

A tooth which was unable to erupt physiologically into its functional , anatomic position with time is said to be unerupted / impacted teeth [23,24]. The current study showed that the prevalence of unerupted /impacted teeth among 18-25 years of age was found to be (4%)

[Figure 1]. The main reason for the impaction was due to lack of space of the path of eruption or may be due to abnormal positioning of tooth bud [25] . The present study indicated that there are predisposing variables which were associated with impaction [26]. Age was a predisposing factor associated with impaction [20]. A tooth that appeared impacted at the age of 18 years may have as many as chances as 30-50% of erupting fully , except horizontally impacted molars [27] . Impaction was more prevalent in individuals among 24 years of age (18.8%) [Figure 2]. The results of this study are in agreement with the study conducted by Seidu A Bello et al 2011 , suggesting that impacted/unerupted teeth are more prevalent in patients with an age range of 19-26 years. [28]

Gender is another predisposing variable which can be associated with impaction [29]. The results of the present study showed that males had undergone more number of extraction due to impaction (55.74%) compared to females (44.26%) [Figure 3]. The findings of the study were similar to study conducted by Enabulele et al 2017 , stating that males (80%) had higher impaction than females (20%) [30]. This supports the assertion that

there are sex- specific mandibular traits with the sexual dimorphism , clearly observed with bigger jaw bone in males [31]. Similarly , the study conducted by Nagaraj T et al 2016, reported that males had higher impaction than females[32] . But contradictory result was found in the study conducted by Korener et al 2015 , stated that the possibility of dietary influence on the physique , role of genetic factors or a combination of genetic and dietary factors have been proposed to have effect on low prevalence of unerupted / impacted third molar this may be the reason for fewer number of males presented compared to females [33, 34] .

.In our study pain was the most commonly associated chief complaint (84.98%). The pain may be due to the type of impaction, or any pathological growth or condition[1,35] . Similar results showed in the study conducted by Seidu A Bello et al 2011 , and Nagaraj T et al 2016 [36,32]. In our study nearly 11.82% of the population had a history of Diabetes mellitus and hypertension etc . Kemp et al 1980 , in his study mentioned that there was no history with signs of associated pathology and also Junko Mat Suyama et al 2015 , clearly mentioned that the medical history was unremarkable[37]. Only (1.69%) of the patients presented with swelling . The study done by Nagaraj T et al 2016, presented that swelling was associated in most of the cases and the root cause for wisdom teeth swelling is a natural response by the body ,when injured or any infection , so the body wants to bring oxygen rich blood , red blood cells and necessary nutrients to the affected area [32] .

Mandibular third molar was found to be more prevalent than maxillary molar (41.9%) [Figure 4]. Two reasons could be thought , one is due to inadequate space between the distal surface of the second mandibular molar and anterior border of the ascending ramus of the mandible and improper oral hygiene [38] . This study was in concordance with a study conducted by P.Santhosh et al 2015, Nagaraj et al 2016 , revealed that mandibular third molars had higher prevalence of impaction than other teeth [32]. The total number of impaction was more prevalent in the third quadrant with mesioangular being the common type (38.31%)[Figure 5]. As the mandibular growth stops , leading to shortage of retromolar space which is a major etiological factor of mandibular third molar impaction [39]. Osunde et al 2014 , obtained the similar result (ie) mesioangular being the most common type due to their late development and maturation, path of eruption and lack of space in mandible at later age [40].

By correlating age ,gender and tooth number males had higher impaction than females [Figure 6]. But both males and females showed equal gender predilection on mandibular third molar with a mean age of 24 years. The chi square test was compared among age, and tooth number was found to be (p= 0.00), statistically significant. It was observed that the total number of extraction done between 18-25 years was found to be n= 7339 (96%) out of which only n=295 (4%) was found with an incidence of impaction .

The overall inference of our study among prevalence of unerupted / impacted teeth were higher in males ,(55.74%) predominantly between the age groups of 24 years (18.8%) due to sex- specific mandibular traits with the sexual dimorphism clearly observed with bigger jaw bone in males with higher incidence of Mandibular third molars [41] . This might be due to inadequate space between the distal surface of the second mandibular molar and anterior border of the ascending ramus of the mandible and improper oral hygiene [42].

The limitation of our study is unicentered with a limited demographic area of smaller sample size . By investigating the prevalence and pattern of impaction and its association with pathological conditions and also this might help broaden existing knowledge about epidemiology of diseases associated with teeth impaction and improve our clinical management to minimize false interpretations .

Conclusion

Within the limitations of the current study , it is found that unerupted / impacted teeth are more common among 24 years of age with male predilection with higher incidence of mandibular molars. This was the most recent and perhaps first ever studies to evaluate the prevalence of unerupted /impacted teeth among 18-25 years of age visiting outpatient Department of Private Dental college and hospitals .In our study only 4% of population had unerupted / impacted teeth when compared to other studies from different countries and regions. Importance of regular dental checkups which could lead to an early detection of unerupted / impacted teeth and institution of appropriate measures before

complications is encountered .

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Ethical Clearance: It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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