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Original Article

A Study on the Prevalence Status of Third Molars in Ludhiana Region: A Cross Sectional Study

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ABSTRACT

Introduction: With the upliftment of civilisations & culture, the use of soft and refined diet has completely rejected the need for a large and strong jaw for mastication. Therefore, with evolution, human jaws have shrunk remarkably from its larger size to a much smaller one and thus making the space to accommodate all the 32 teeth cumbersome. Hence, the last teeth to develop i.e., third molars are most often impacted. An impacted tooth is a tooth that is impeded from erupting into its usual position in the oral cavity because of lack of space, malposition, or other local or general impediments. The most frequently impacted teeth are the third molars because this late eruption is solely responsible for impaction of the third molar tooth. Various races and population groups exhibit definite inherited patterns of jaw size, tooth size and facial growth and this racial variation in jaw size, tooth size and facial growth is crucial for determination of the eruption, impaction and higher incidence of agenesis of third molars.

Materials and Methodology: A descriptive, cross-sectional study carried out among 200 participants aged between 18 to 26 years from randomly selected three regions of Ludhiana city. 9 groups were made according to age (in completed years) with class interval of one year. Then 20 candidates were selected randomly from each group. Students who had full set of teeth and had exact date of birth were in the inclusion criteria. Those participants who did not give consent and had history of previous extraction of any of the teeth were not included in the study. The personal information of the subjects like name, age, sex, caste, religion and socio-economic status were recorded in a pre-tested, pre-structured proforma. Clinical examination was then done to see the status of third molars and based on the status of their eruption they were classified into completely erupted, partially erupted and unerupted. The eruption status was then assessed by using visual method and with the aid of mouth mirror and straight explorer. The teeth which were to be thought of partially erupted and unerupted were subjected for radiographic examination. The intra-oral peripheral X-rays of subjects were also taken and evaluated. Data were collected and analysed statistically.

Results: The mean age range of the study group was 21 years (± 2.58). The total number of third molars found in 200 subjects was 700; out of them 347 teeth were maxillary and 353 teeth were mandibular. The proportion of third molar agenesis was around 3.33% (24 of total 700 teeth). The third molar agenesis showed predilection for maxilla (4.72%) than mandible (1.94%). Almost 93.88% subjects had all four third molars whereas 2.78% had three third molars, 1.11% had two third molars and 0.5% had only one third molar. Only 1.67% of the subjects had agenesis of all third molars. Eruption status of maxillary and mandibular third molars in which 33.62% of teeth were completely erupted, 40.09% were partially erupted and 26.29% of teeth were unerupted. Complete eruption was found more in mandibular third molars (43.91%) as compared to maxillary third molars (23.03%); while non eruption was resulted more common in maxillary third molars (46.94%) as compared to mandibular third molars (6.23%). Various confounding factors like sex, religion and socio-economic status did not associate with eruption of maxillary and mandibular third molars (P>0.05).

Conclusion: So, the most commonly impacted teeth have predilection towards females than males involving mandible more often. Agenesis was reportedly more common in females than males involving the right side. Left sided mesio-angular impaction was more common pattern of impaction followed by right sided vertical and left sided horizontal type. The most commonly impacted teeth were maxillary right third molar followed by mandibular right third molar.

KEYWORDS: Impactions, Eruption, Third Molar, Agenesis.

INTRODUCTION

Nature tries to eliminate anything that is not in use is a universally known and proven fact which applies to this scenario also. Likewise, with the upliftment of civilisations & culture, the use of soft and refined diet has completely rejected the need for a large and strong jaw for mastication. Therefore, with evolution, human jaws have shrunk remarkably from its larger size to a much smaller one and thus making the space to accommodate all the 32 teeth cumbersome.[1] Hence, the last teeth to develop i.e., third molars are most often impacted. An impacted tooth is a tooth that is impeded from erupting into its usual position in the oral cavity because of lack of space, malposition, or other local or general impediments.[2]

Peterson[3] explained impacted teeth are those teeth that are unable to erupt into the dental arch within the stipulated time of eruption. By the end of 2004, *Farman*[4] quoted that impacted tooth are those teeth that are prevented from eruption due to a strong physical barrier along the path of eruption.

There are wide racial variations in the eruption sequence of third molars, although in all races these set of teeth are the last teeth to erupt. The most frequently impacted teeth are the third molars because this late eruption is solely responsible for impaction of the third molar tooth. Various races and population groups exhibit definite inherited patterns of jaw size, tooth size and facial growth and this racial variation in jaw size, tooth size and facial growth is crucial for determination of the eruption, impaction and higher incidence of agenesis of third molars.[5]

Generally, third molars erupt between the ages of 18 and 21 years[6,7] and their eruption time varies with different races.[6-9] Mandibular third molars may erupt at 14 years of age in Nigerians[7] and in Europeans show that it may erupt even at an age of 26 years.[8]

The third molars in males erupt 3-6 months ahead of that of females.[7] An unerupted or partially erupted tooth can cause mild to severe clinical manifestations. Patients having unerupted tooth seek dental treatment because of pain or swelling or other reasons. The literature shows that tooth impaction is a common phenomenon. However, different regions of the jaw show considerable variations in the prevalence and distribution of impacted third molars.[10]

Therefore, the objective of this study was to evaluate the eruption status of third molars and the type of impaction in the college students in the city of Bangalore within the age group of 18-26 years.

MATERIALS AND METHODOLOGY

A descriptive, cross-sectional study carried out among 200 participants (100 male and 100 female) aged between 18 to 26 years from randomly selected three regions of Ludhiana city. 9 groups were made according to age (in completed years) with class interval of one year. Then 20 candidates (10 male and 10 female) were selected randomly from each group. So, the purpose of this study was explained to each participant and an informed consent was taken. Candidates s who had full set of teeth and had exact date of birth were in the inclusion criteria. Those participants who did not give consent and had history of previous extraction of any of the teeth were not included in the study. The personal information of the subjects like name, age, sex, caste, religion and socio-economic status were recorded in a pre-tested, pre-structured proforma. Clinical examination was then done to see the status of third molars and based on the status of their eruption they were classified into completely erupted, partially erupted and unerupted. The eruption status was then assessed by using visual method and with the aid of mouth mirror and straight explorer. The teeth which were to be thought of partially erupted and unerupted were subjected for radiographic examination. The intra-oral peripheral X-rays of subjects were also taken and evaluated. Data were collected and analysed statistically.

RESULTS

The mean age range of the study group was 21 years (± 2.58). The total number of third molars found in 200 subjects was 700; out of them 347 teeth were maxillary and 353 teeth were mandibular. The proportion of third molar agenesis was around 3.33% (24 of total 700 teeth). The third molar agenesis showed predilection for maxilla (4.72%) than mandible (1.94%).

Almost 93.88% subjects had all four third molars whereas 2.78% had three third molars, 1.11% had two third molars and 0.5% had only one third molar. Only 1.67% of the subjects had agenesis of all third molars.

Table-1 depicts the eruption status of maxillary and mandibular third molars in which 33.62% of teeth were completely erupted, 40.09% were partially erupted and 26.29% of teeth were unerupted. Complete eruption was found more in mandibular third molars (43.91%) as compared to maxillary third molars (23.03%); while non eruption was resulted more common in maxillary third molars (46.94%) as compared to mandibular third molars (6.23%). Table-2 shows that various confounding factors like sex and socio-economic status did not associate with eruption of maxillary and mandibular third molars (P>0.05).

Table 1: Status of eruption of maxillary and mandibular third molars:

Status of eruption	Completely erupted	Partially erupted	Unerupted	Total
Maxillary	79 (22.7%)	107 (30.8%)	161 (46.3%)	347 (100%)
Mandibular	155 (43.91%)	176 (49.86%)	22 (6.23%)	353 (100%)
Total	234 (33.4%)	283 (40.4%)	183 (26.29%)	700 (100%)

Table 2: Significance of variables of third molar eruption:

Variable	Completely erupted	Partially erupted	Unerupted	Chi – square	P – value
Sex					
Male	116 (33.14%)	151 (43.80%)	80 (23.05%)	5.21	0.074
Female	120 (34.10%)	126 (36.39%)	103 (29.51%)		
Social class					
Upper	44 (34.6%)	43 (35.2%)	38 (30.4%)	2.144	0.753
Middle	124 (32.8%)	153 (41.67%)	95 (25.54%)		
Lower	69 (34.67%)	79 (40.20%)	50 (25.13%)		

DISCUSSION

The mean age of the study participants were 21 years (± 2.58 SD). *Sandhu* et al[3] observed a mean age range of their subjects as 19.3 years. *Byahatti S* et al[1,2] reported 21.58 years (±2.9079) as mean age of their subjects and 23.5 years (±2.9079) in other two studies conducted in Libya and South India respectively.

This research has been aimed to identify the eruption status of third molars and also the reasons behind their impactions. They identified that the third molars are most often congenitally missing. Even if present, they may follow an abnormal path of eruption and remain impacted as a result of insufficiency in space at the site of their eruption.[11] Third molars almost contribute for 98% of all impacted teeth. The aetiology behind agenesis of one or more molars is unknown, but several mechanisms that have been suggested like a physical disruption of dental lamina during the developmental stage, space limitation, an inherent defect of dental lamina and failure of induction of the underlying mesenchyme.

In the present study, 33.62 % of the third molars were identified to be completely erupted and remaining 66.38% of the teeth were in various stages of their eruption. Almost same results were observed in *Byahatti S* et al.[1] but in *Sandhu* et al,[3] 24% of the teeth were found to be erupted and 76% were in various stages of eruption.

The ratio of students with all the 4 third molars was higher (93.88%) than a study by *Sandhu* et al.[3] (76%) but lesser than *Byahatti S* et al[2] (94.66%) research conducted in Indian population. In the present study, the incidence of congenitally missing third molars was found to be 3.33% which is lower than the results observed by *Sandhu* et al[3](11.5%), *Levesque* et al[7] reported 9% in French Canadians, *Hattab* et al[8] among the Jordanian people (9.1%), *Venta* et al[9] reported 12% in Finnish students (12%).

In the present study conducted on college students of Bangalore city (India), 1.67% showed agenesis of all third molars, which is almost concurrent to the results obtained from *Hattab* et al[8] (1.7%) and *Hugoson* and *Kugelberg*[10] on Swedish population (2%); but showed slightly less results reported by *Byahatti* S et al[1,2] (2.5% for Libyan population and 3.33% for South Indian population).

The reported ratio of agenesis of third molars in boys (2.22%) was higher than girls (1.11%) and these findings were identical to the findings obtained by *Levesque* et al[7] and *Hattab* et al[8] but differs slightly from those obtained by *Sandhu* et al[3] and Shah et al.[11]

The proposed results show that maxillary agenesis (4.72%) was the commonest than the mandibular (1.94%), which is similar with the results of earlier studies.[3,8]

Observations of present study showed that more than three quarters of the subjects had all four third molars, which was similar to the results obtained by *Hattab* et al[8] and Sandhu et al.[3]

But this ratio was on the higher side when compared with the findings of *Hellman*[12] on American students, who noted that one half of the persons had all four third molars. Results showed no significant differences in eruption status of third molars among boys and girls, (P value = 0.074), which was in close relation with the results obtained from *Hattab* et al.[8] Study shows that maxilla had a higher frequency of unerupted teeth (46.94%) than the mandible (6.23%). 33.62% of third molars were fully erupted, this value is in close with those obtained by *Venta* et al[9](35%) but more than that reported by *Sandhu* et al[3](24%) and less than what is reported by *Hattab* et al[8] as (58%).

CONCLUSION

So, the most commonly impacted teeth have predilection towards females than males involving mandible more often. Agenesis was reportedly more common in females than males involving the right side. Left sided mesio-angular impaction was more common pattern of impaction followed by right sided vertical and left sided horizontal type. The most commonly impacted teeth were maxillary right third molar followed by mandibular right third molar.

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