

THIRD MOLAR AGENESIS

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ABSTRACT

AIM: To study the prevalence of third molar agenesis among different populations.

OBJECTIVE:

- to conduct a study by radiographing, to check the prevalence of third molar agenesis among the different populations.
- to conclude the increased or decreased prevalence of missing third molars for the respective populations.

BACKGROUND: Dental agenesis is the condition where one or more teeth fail to develop and hence are missing. Agenesis of the third molar is very frequent and most frequent in both third molars. 75% of agenesis of other teeth is associated with third molar agenesis.

REASON: Third molar agenesis is pretty frequent and the frequency varies among different populations. This study will help assess the prevalence of the third molar agenesis among the populations and help conclude the variations in its prevalence among the different populations.

Keywords: Impaction, Indian, Malaysian, Third molar, third molar agenesis

RUNNING TITLE: Third molar agenesis

INTRODUCTION:

Third molars are the most common congenitally missing teeth and also frequently impacted because they are the last to erupt and will mostly remain asymptomatic for years but sometimes cause pain, cysts, tumors, infection, root resorption of adjacent teeth and pericoronitis⁽¹⁾. Agenesis or a congenitally missing tooth is when a tooth fails to form between the ranges of age of its growth and development. The third molar (M3) is a tooth that develops entirely after birth and is also the last tooth to erupt in all ethnic groups despite racial variations in the eruption sequence. Environmental factors, systemic diseases, genetic polymorphisms and teratogens were shown to affect tooth development with effects on tooth size, shape, position, and total absence. Studies show that the frequency of maxillary third molar agenesis increased significantly with decreasing maxillary basal bone⁽²⁾. Anthropologists state that constantly increasing cerebration of man is enlarging his brain size at the expense of his jaws. The use of soft and refined

diet has eliminated the human need for large and powerful jaws. In this decrease in size, the number of certain teeth no longer necessary for function of mastication and feeding is either getting increasingly impacted or is not developing at all. Therefore the incidence of the third molars getting impacted or genetically missing is the highest⁽³⁾. Third molar agenesis can be attributed to genetic changes like mutations of genes like Unclustered Hox and Homeobox genes and also due to changes in dietary habits⁽⁴⁾. Studies show that third molar agenesis varies among individuals of different populations. Intraindividual differences pose difficulty in assessing the dental age. Racial variation, nature of diet, degree of use of masticatory apparatus and genetic inheritance can affect the jaw size and tooth size⁽⁵⁾. Third molars are the more commonly missing teeth with a range from 9 to 20% population with one or more third molars missing, and a male to female ratio of 3:2⁽⁶⁾.

There may be several causes for congenital absence of teeth including physical obstruction or disruption of the dental lamina, space limitation, and functional abnormalities of the dental epithelium or failure of initiation of the underlying mesenchyme⁽⁷⁾. Third molar agenesis can even cause morphological variations such as change in size or loss of cusps in the other erupted molars⁽⁸⁾. An association is also seen between third molar agenesis and other permanent tooth agenesis and other dental anomalies like microdontia of maxillary lateral incisors^(9,10). Third molar agenesis can also occur in a condition known as hypohyperdontia where missing third molars are associated with other permanent supernumerary teeth⁽¹¹⁾.

Occurrence of third molar agenesis in Down's syndrome is four times higher than normal⁽¹²⁾, indicating genetic predisposition⁽¹³⁾. When third molar is congenitally missing occurrence of hypodontia elsewhere in the permanent dentition is 13 times greater⁽¹⁴⁾. The difficulties in the study of third molar development and in its clinical or forensic application are especially related to the variability in the formation of these teeth. Although this variability may mostly relate to population differences, other factors, such as gender, age, and degree of dental maturation of the individuals in the different samples, may also play a major role⁽¹⁵⁾. This study aims to compare the prevalence between Malaysian and Indian populations.

MATERIALS AND METHODS

This study was conducted in saveetha dental college by collecting orthopantomographs (OPG) from the department of oral medicine and radiology. The study population represented patients from two races: the Malaysians and the Indians. The sample population was 25 OPGs of each population. OPGs were collected from age groups 18 and above. The individuals had no history of exfoliation or extraction of the third molar. Patients with facial clefts or any other craniofacial syndromes that could affect tooth development and radiographs showing major dental pathologies like tumors or cysts were excluded. The collected OPGs were checked for missing third molars and the prevalence of third molar agenesis was assessed.

RESULTS

Table 1.1

POPULATION	NO ABSENCE OF THIRD MOLAR	ABSENCE OF 1 THIRD MOLAR	ABSENCE OF 2 THIRD MOLARS	ABSENCE OF 3 THIRD MOLARS	ABSENCE OF 4 THIRD MOLARS
MALAYSIAN	13	6	4	2	0
INDIAN	6	6	5	3	5
TOTAL	19	12	9	5	5

Table 1.2

MISSING TEETH	MALAYSIAN	INDIAN	TOTAL
MAXILLARY RIGHT	2	7	9
MAXILLARY LEFT	3	5	8
MANDIBULAR RIGHT	5	4	9
MANDIBULAR LEFT	2	3	5
TOTAL	12	19	31

DISCUSSION

The prevalence of third molars was comparatively more among Indians when compared to Malaysians. The third molar agenesis did not occur in most of the Malaysians (52%)⁽²⁾. One third molar was missing in about 24% of the Malaysian population. Two third molars were missing in about 16% of the Malaysian population. Three third molars were missing in about 8% of the Malaysian population. The absence of all third molars was not seen among the Malaysians⁽²⁾. Among the Indian population, no third molars were absent in about 24% of the total population. Absence of one third molar had the same occurrence of no third molar absence, that is in about 24%. Two third molars were absent in about 20% of the Indian population. About 12% of the Indian population

showed agenesis of three third molars and 20% represented agenesis of four third molars. The occurrence of complete third molar agenesis is more prevalent among Indians. Agenesis occurred majorly on the right side which is concurrent with previous studies⁽¹⁶⁾. Maxillary molars showed higher agenesis than mandibular molars⁽⁶⁾. Among Indians the most common missing tooth is the maxillary right whereas among Malaysians the mostly common missing tooth is the mandibular right. In our sample of 50 orthopantomographs third molar agenesis was present in about 38%. Complete third molar agenesis was not seen among the Malaysian population whereas was present in Indians.

CONCLUSION

Third molar agenesis varies in frequency depending on the population^(17,18,19,20,21). Third molar agenesis can be considered a dental anomaly due to mutation and selective process based on heredity⁽²²⁾. From the above concluded results third molar agenesis is more common in Indian population than in Malaysian population. Maxillary right third molar is the most commonly missing teeth among Indians. Malaysians represented missing Mandibular right third molar frequently. This study is of relative significance as tooth number polymorphisms are not an isolated phenomenon but relates to size, development and calcification of the dentition as a whole⁽²³⁾.

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