

ERUPTION OF THIRD MOLAR TEETH IN VARIOUS AGE GROUPS IN BOTH SEXES BY RADIOGRAPH IN JHALAWAR POPULATION

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Abstract

Forensic medicine deals with estimation of age of a person for medicolegal purposes. Hard tissues are able to resist to decay and degradation in the human dentition.

Aim & Objectives: The association of third molar teeth eruption in various age groups in both sexes by radiograph in Jhalawar population of Rajasthan state.

Material & Methods: The analytical cross sectional study was conducted in the department of forensic medicine & toxicology and radiodiagnosis department in Jhalawar Medical College & S.R.G hospital, Jhalawar, Rajasthan. Our number of cases was 150 in which 75 girls and 75 boys of both sexes were included in this study, bearing age group between 13- 25 years. Dental examination of the subjects was done with the help of mirror, probe and teeth were counted by palmer's notation. The intra-oral periapical radiograph of upper and lower third molar teeth of all subjects were taken and observed regarding various stages by Nolla's stages of development of teeth.

Results: Our present study shows that socio-economic status has no effect on the development and eruption of third molar teeth at various stages.

Conclusion: There is no co-relation of socio-economic status, and physical characters have no effect on the eruption and development of various stages of third molar teeth. Third molar teeth eruption alone should not be used for age estimation. Third molar agenesis is more in case of girls than in boys.

Key-words: Socioeconomic status, Third molar teeth, Age estimation, Secondary sexual character.

Introduction

The third molar also known as wisdom tooth and it is located at the most posterior position among all the three molars in each quadrant of human dentition. The third molar generally erupts between the ages of 17 and 23. Preferably, the eruption of the third molar is just like all other teeth and be properly aligned. However, often these third molars are misaligned which can on occasion lead to crowding of the teeth or damage to adjacent teeth, and rarely to cystic pathology or root resorption¹. The hard tissue of human dentition are able to resist decay and degradation, long after other tissue are lost. This resistance to decay has made teeth useful indicators for assessing variation in diet, expression of metabolic diseases, and calculation of age at the time of death². There are several ways to classify impacted third molars. Based on the nature of the overlying tissue impaction, impacted lower wisdom teeth can be classified into 2 types:

1. Soft Tissue Impaction. When the height of the tooth's contour is above the level of the surrounding alveolar bone and the superficial portion of the tooth is

covered only by soft (though this can be dense and fibrous) tissue. Soft tissue impaction is usually the easiest type of impacted tooth to remove.

2. Hard Tissue ('Bony') Impaction. This is where the wisdom tooth fails to erupt due to being obstructed by the over lying bone. This can be sub-divided into (a) partial and (b) complete bony impactions³.

The determination of age of an individual is necessary for the law enforcement agencies in field of medical and legal professions. There are three periods in life, each differing in relation to tooth development. The first period is from utero to the time of eruption of the first tooth. The second phase is from age of eruption of the first tooth to about 12 years, the third follows when almost all permanent teeth are already present in the mouth⁴. It is generally considered that one can estimate age with accurate result from some months in utero up to the age of twenty. This may be the case up to twelve years, but between that age and twenty years of age estimations are based only on the development of the root of the third molars.

NOLLA (1960)³ observed ten stages of development of teeth as follow as: Stage (0)-Absence of crypt. Stage (1)-Presence of crypt. Stage (2)-Initial Calcification. Stage (3)-1/3 Crown Completed. Stage (4)-2/3 Crown Completed. Stage (5) - crown almost completed. Stage (6) -Crown completed. Stage (7)-1/3 Root Completed. Stage (8)-2/3 Root Completed. Stage (9) – Root almost completed apex open. Stage (10) - Apical ends of roots. Schour and Massler⁴ stated that the age of calcification and of teeth are distinct process and may not correspond to those of chronological age. Lagan and kronfeld' observed that the crown of lower third molar completely develops between the age of 12 to16 years. But further observed that the root of this tooth is completed at the age of 18 to 25 years. This study is attempt to highlight the relation of the development of individual and eruption of third molar teeth in various age groups in both sexes by radiograph in Jhalawar population.

Aims and Objectives:

1. The co-relation of eruption of third molar teeth with age in both sexes by using radiograph in Jhalawar population of Rajasthan state.
2. Variations in eruption of third molar teeth according to religion, race and physical development among both sexes.

Material & Method:

The analytical cross sectional study was conducted in the department of forensic medicine &toxicology and

radio diagnosis department in Jhalawar Medical college & SRG hospital, Jhalawar, Rajasthan. Total numbers of cases were 150 in which 75 girls and 75 boys of both sexes, bearing age group between 13- 25 years were included in this study. All candidate was chosen from different schools, colleges and outdoor in Jhalawar Medical college & SRG hospital, in Jhalawar city. The subjects for the study were divided into following groups: 13-14 years, 14-15 years.15-16 years, 16-17 years,17-18 years.18-19 years,19-20 years, 20-21 years,21-22 years, 22-23 years, 23-24 years &24-25 years. All subjects were examined by recording their physical parameters like height, weight, and general body development. Ages of boys were determined by facial hair appearance(around 15 years of age). Ages of girls were recorded by onset of menarche(at the age of 10-15 years) along with development of breast(starts at the age of 8 to 13 years).Presences of pubic and axillary hairs were recorded in both sexes. Socio-economical status was based onthe history given by subjects like their job, income, residential area and education. The dental examination of the subjects was done with the aid of mirror; probe and counting of teeth were recorded by palmer's notation. The intra-oral periapical radiograph of upper and lower third molar teeth of all subjects were taken and observed regarding various stages by Nolla's stages of development of teeth.

Results

Table 1: Shows different socio-economic status (Upper class, Middle class & Low class) in relation to different age groups (13-14 years to 24-25 years) in boys &girls.

Age group (In Year)	Total no. of girls	Total no. of boys	Upper Class		Middle Class		Lower Class	
			Girls	Boys	Girls	Boys	Girls	Boys
13-14	5	7	2	1	1	2	2	4
14-15	5	4	1	1	2	2	2	1
15-16	4	10	1	1	2	4	1	5
16-17	11	5	3	1	7	2	1	2
17-18	12	8	2	2	7	4	3	2
18-19	3	5	0	1	2	3	1	1
19-20	8	9	1	2	3	4	4	4
20-21	7	8	2	1	4	4	1	3
21-22	4	8	0	2	2	4	2	2
22-23	6	3	1	1	4	1	1	1
23-24	5	4	1	0	4	2	0	2
24-25	5	4	2	1	2	2	1	1

Table 2: Shows religion wise distribution of total number of cases

Age groups (in year)	Total no. Cases	Hindu		Muslim	
		Girls	Boys	Girls	Boys
13-14	13	6	2	3	2
14-15	12	4	5	2	1
15-16	18	4	3	3	8
16-17	16	4	2	4	6
17-18	13	2	4	1	6
18-19	11	3	4	1	3
19-20	16	3	5	6	2
20-21	11	4	2	3	2
21-22	14	5	3	2	4
22-23	12	5	4	1	2
23-24	14	4	3	5	2

Table 3: Shows onset of menarche in respective age such as 12-13 years, 13-14 years and 14-15 years and 13.33%, 69.33% & 17.33% respectively.

No. of girls	Age of onset of menarche	Percentage
10	12-13 years	13.33%
52	13-14 years	69.33%
13	14-15 years	17.33%

Table 4: Show the stages of eruption of third molar teeth in different age group.

Age group in Year	No. of Cases		Developmental Stage of teeth			
	Girls	Boys	Mandibular		maxillary	
			Girls	Boys	Girls	Boys
13-14	6	2	-	-	-	-
14-15	5	4	-	-	-	-
15-16	8	6	3	3	3	3
16-17	10	9	7	7	7	7
17-18	9	10	8	8	8	8
18-19	8	8	8	8	8	8
19-20	9	7	8	8	9	9
20-21	5	7	9	9	9	9
21-22	3	6	9	9	10	10
22-23	4	8	10	10	10	10
23-24	2	5	10	10	10	10
24-25	6	3	10	10	10	10

Discussion:

This present study included 150 cases out of which 75 were boys & 75 were girls. Observation of present study indicates that socio-economic status have no effect on the eruption and development of third molar teeth at various stage⁶. The findings are inconsistent with Brauer et al (1942)⁷ who observed that nutrition play an important part in the calcification and eruption of the teeth. Possible reason for this contradiction is that above cited authors have studied the teeth of children and not adults.

According to our table no.2 which shows that there is no difference according to the religion in the development of third molar teeth. Breast development commences prior to the age of 13 years but in our present study earlier stages of development of breast could not be observed because the limit of age in this study involves 13 years to 25 years of age groups. In both sexes the pubic hair was appeared at the age of 13-14 years in both sexes and axillary hair at the 13 to 14 years in girls and 14 to 15 years in boys in majority of cases. Observation is similar to those observed in Modi⁸, Parikh⁹ and Nandi¹⁰. In the age group of 13-14 years, in most of the cases we found the crown completion of third molar

teeth was found at the age of 13 to 14 years. At the age of 14 to 15 years crown completion stage was observed in all cases in both sexes. Demirijaner et al (1985)¹¹ who given the opinion that dental development are independent of somatic and or sexual maturity. The present study shows that the age of menarche in majority of cases was 13 to 14 years. At this age group crown of third molar teeth was seen completed in most of the cases.

Our this study shows that the eruption of third molar teeth is mostly seen in 17-18 years of age group. The findings of eruptions of third molar are consistent with Modi⁸ (1991) but not consistent with observation of Powell (1953)¹², who while working as police surgeon of Bombay give the upper limit 14 years for third molar teeth in Indian children. As soon as second molar teeth erupts the space for the third molar teeth starts to formed it was seen well marked at the age 16-17 years in most of cases. Mandibular third molar teeth in have earlier eruption in comparison to maxilla. The tipoff crown of third molar tooth was seen in most of the cases and the finding are consistent with Schranz" (1959)¹³ but not consistent with Koskil et al (1957)¹⁴ who concluded that molars do not cut the gums until they have almost reached theocclusal level. The findings are also similar to Adler (1959)¹³. Who observed that eruption is not bilaterally symmetrical. These finding are not inconsistent with observations of Schranz (1959)¹³. The 2/3rd of root completion stage of third molar teeth was seen in most of cases and usually erupts at this stage. These finding are consistent with Orban (1928) that eruptions of the teeth are intimately related to elongation of the roots of teeth but not consistent with Carison" (1944)¹⁴ who observed that elongation of the root and movement of the crown towards the oral cavity do not necessarily occur together.

Conclusion:

There is no co-relation of socio-economic status, and physical characters on the eruption of third molar and its development at various stages. No notable difference was observed in the development stage of third molar teeth in girls and boys. Eruption of third molar alone should not be used for age estimation. Third molar agenesis is more in case of girls than in boys.

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