



## The determination of age by relation of eruption of third molar teeth with development of individual in Bikaner population

Authors

**Dr Rakesh Garg<sup>1</sup>, Dr Manoj Garg<sup>2</sup>**

<sup>1</sup>Senior Resident, Dept. of Dentistry, S.P. Medical College, Bikaner, Rajasthan

<sup>2</sup>Assistant Professor, Department of Forensic Medicine & Odontology, S.P. Medical College, Bikaner, Raj

### Abstract

**Background:** *The human dentition was able to resist degradation and decay, long after other tissues are lost. This resistance of decay that has made teeth useful indicators for assessing variations in diet, expression of metabolic diseases, and calculation of age at the time of death. 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 Bikaner population.*

**Material & Methods:** *The randomized controlled trial study was conducted in the department of forensic medicine & toxicology and radio-diagnosis department in P.B.M hospital, Bikaner, Rajasthan. Total number of cases 250 (105 girls and 145 boys) both sexes, bearing age group between 13- 25 years. The candidate were chosen from different schools, colleges and outdoor in P.B.M hospital, in Bikaner city. Only those cases were selected whose exact date of birth was verified by the school/ college authority subjects residing for more than 10 years in Bikaner city were included in the study.*

**Results:** *In our study showed different socioeconomic status (Upper class, Middle class & Low class) in relation to different age groups (13-14 years to 24-25 years) in boys & girls, maximum subjects were occurred in middle class and onset of menarche in respective age such as 12-13 years, 13-14 years and 14-15 years and 13.3%, 69.5% & 17.1% respectively.*

**Conclusion:** *Socio-economic status, racial and physical characters have no effect on the eruption and development of various stages of third molar teeth. No significant difference was observed in the development stage of third molar teeth in girls and boys. Third molar teeth eruption alone should not be used for age estimation. Agenesis of third molar is more in case of girls than in boys.*

**Keywords:** *Eruptions, third molar, Development, age estimation, stages.*

### Introduction

The determination of age of individual is necessary for the law enforcement agencies in field of medicolegal professions.<sup>1</sup>

The human dentition was able to resist degradation and decay, long after other tissues are lost. This resistance of decay that has made teeth useful indicators for assessing variations in diet,

expression of metabolic diseases, and calculation of age at the time of death<sup>2</sup>. 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 mouth<sup>3</sup>.

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)<sup>1</sup> 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 completed.

Schour and massler (1941)<sup>4</sup> stated that the age of calcification and of teeth are distinct process and may not correspond to those of chronological age.

Lagan and kronfeld (1954)<sup>5</sup> observed that the crown of lower third molar completely develops between the age of 12 to 16 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 Bikaner population.

### Materials and Methods

The randomized controlled trial study was conducted in the department of forensic medicine & toxicology and radio-diagnosis department in P.B.M hospital, Bikaner, Rajasthan. Total number of cases 250 (105 girls and 145 boys) both sexes, bearing age group between 13- 25 years. The candidate were chosen from different schools, colleges and outdoor in P.B.M hospital, in Bikaner city. Only those cases were selected whose exact date of birth was verified by the school/ college authority subjects residing for more than 10 years in Bikaner city were included

in the study. 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.

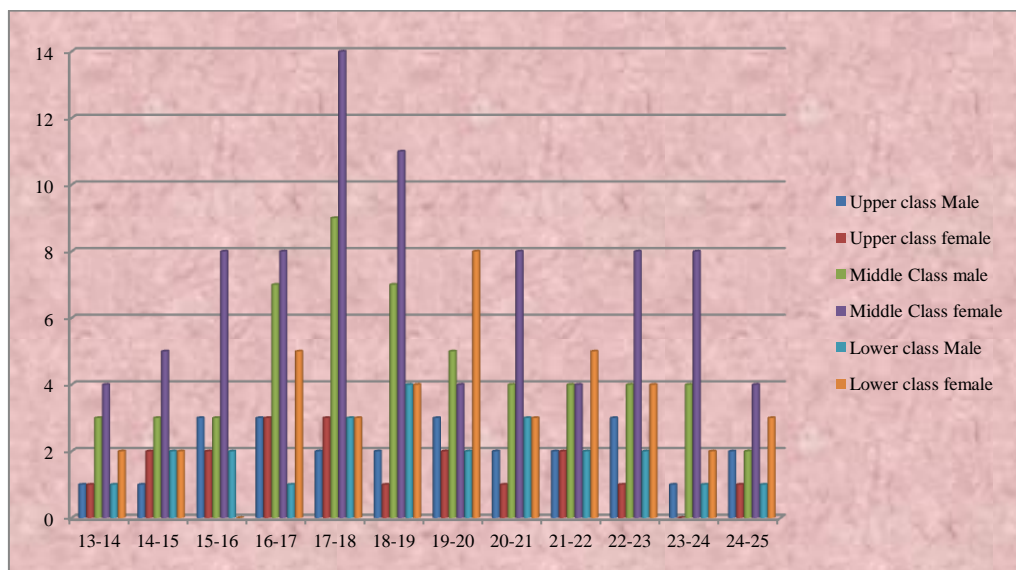
The subjects were examined clinically for recording physical parameters like height, weight, and general body development. Ages of onset of menarche along with development of breast were recorded in girls. Presence of hair in pubic, axillary, in both sexes and hair on face in cases of males were recorded. The dental examination of the subjects were 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 and Observations

In our study showed different socioeconomic status (Upper class, Middle class & Low class) in relation to different age groups (13-14 years to 24-25 years) in boys & girls, maximum subjects were occurred in middle class (table 1). Table no. 3 show the onset of menarche in respective age such as 12-13 years, 13-14 years and 14-15 years and 13.3%, 69.5% & 17.1% respectively. Table no. 4 showed that the stages of eruption of third molar teeth in different age group.

**Table 1:** Showing different socioeconomic status in relation to different age groups in boys & girls.

Age groups (in year)	Upper class		Middle Class		Lower class	
	Male	female	male	female	Male	female
13-14	1	1	3	4	1	2
14-15	1	2	3	5	2	2
15-16	3	2	3	8	2	0
16-17	3	3	7	8	1	5
17-18	2	3	9	14	3	3
18-19	2	1	7	11	4	4
19-20	3	2	5	4	2	8
20-21	2	1	4	8	3	3
21-22	2	2	4	4	2	5
22-23	3	1	4	8	2	4
23-24	1	0	4	8	1	2
24-25	2	1	2	4	1	3
Total	25	19	55	86	24	41



**Graph 1:** Showing different socioeconomic status in relation to different age groups in boys & girls.

**Table 2:** Showing onset of menarche in respective age.

No .of Girls	Age of onset of menarche	Percentage (%)
14	12-13 Years	13.33 %
73	13-14Years	69.52 %
18	14-15Years	17.14 %

**Table 3:** Showing development stages of third molar in various age groups.

Age groups (in year)	No. of cases		Development stage of teeth			
			Mandibular		Maxillary	
	male	female	male	female	male	female
13-14	5	7	-	-	-	-
14-15	6	9	-	-	-	-
15-16	8	10	3	3	3	3
16-17	11	15	7	7	7	7
17-18	14	20	8	8	8	8
18-19	13	16	8	8	8	8
19-20	10	14	9	9	9	9
20-21	9	12	9	9	9	9
21-22	8	11	10	10	10	10
22-23	9	13	10	10	10	10
23-24	7	10	10	10	10	10
24-25	5	8	10	10	10	10

### Discussion

Present study included 250 cases out of which 145 were boys & 105 were girls and found that the socio-economic status have no effect on the eruption and development of various stages of third molar teeth. The findings are not consistent with Brauer et al (1942)<sup>6</sup> who observed nutrition play a part in the calcification and eruption of the teeth. The possible reason for this contradiction is that above cited authors have studied the teeth of children.

In the age group of 13-14 years crown completion of the third molar was found in most of the cases and at the age of 14-15 years crown completion stage was observed in 100% cases in both sexes. Demirjaner et al (1985)<sup>7</sup> who given the opinion that dental development are independent of somatic and or sexual maturity. The present study showed that the age of menarche in majority of cases is 13-14 years. The crown of third molar teeth was seen completed in most of the cases at these age groups. The observation of present study shows that the eruption of third molar is seen in age group of 17-18 years. The findings of eruptions of third molar are consistent with Modi (1991)<sup>8</sup> but not consistent with observation of Powell(1953)<sup>9</sup>, 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 start to form and it was seen well marked at the age 16-17 years in most of cases in present study.

Third molar teeth in mandible have reflected 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)<sup>10</sup> but not consistent with Koski et al (1957)<sup>11</sup> who concluded that molars do not cut the gums until they have almost reached the occlusal level. These finding are not inconsistent with observations of Schranz (1959)<sup>10</sup>. The 2/3rd of root completion stage of third molar teeth was seen in most of case and usually erupts at this stage. These finding are not consistent with

Carison (1944)<sup>12</sup> who observed that elongation of the root and movement of the crown towards the oral cavity do not necessarily occur together.

### Conclusion

Socio-economic status, racial and physical characters have no effect on the eruption and development of various stages of third molar teeth. No significant difference was observed in the development stage of third molar teeth in girls and boys. Third molar teeth eruption alone should not be used for age estimation. Agenesis of third molar is more in case of girls than in boys.

### References

1. Reddy K.S.N. Identification; The synopsis of Forensic Medicine and Toxicology; (ed.) 8th, 1992; 28-45.
2. Shamim T,Ipe Varghese V, et al AGE ESTIMATION: A DENTAL APPROACH :JPAFMAT, 2006; 6. ISSN 0972-5687.
3. Rajdan D. A study of third molar teeth in Indian subjects of Uttar Pradesh; J. Ind. Dent. Assoc: Jan 1996; Vol.67 (1) : page 7.
4. Schour, I and massler, M. The development of the human dentition; J. Am. Dent. Assoc.1941; Vol. 28, Page: 1153.
5. Lagan, W.H.G. and kronfield, R. Estimation of age. In basic reading on identification of human skeletons. Ed. By T. D. Stewart and M. Trotter. Newyork: Wenner Green foundation for othopological research, Ine. 10 th Edition. 1954.
6. Brauer, J.C. and Bahadur, M.A. Variation in calcification and eruption of the deciduous and permanent teeth. J. Am. Dent. Assoc.1942;Vol. 24:1373.
7. Demirjaner a., Buschang P.H., Tanquary R., Patterson D.K. Interrelationships among measures of somatic, Skeletal, Dental and sexual maturity. Am. J. Orthod: Nov, 1985; 88(5):page no. 433.

8. Modi. Personal identity, Modi,,s Medical Jurisprudence and Toxicology; Butterworth,,s (edi.)22nd, 1988; 35 – 42.
9. Powell A. Lyon`'s Medical Jurisprudence for India, Gravel 10th edition 1953.
10. Schranz, D. Kritik der Auswertung der Alters bestinnungsmerk mal vesszahner und Knochen; Cited from Forensic Odontology by Gustafson. 1959.
11. Koski, K. and Garn, S.M. Tooth eruption sequence in fossil and modern man , Amer. J. Anthropol.1957; 15: 469.
12. Carison (1944): Studies on the rate and amount of eruption of certain human teeth. Am. J. Orthodont, Vol.30, page578.