



## A CROSS-SECTIONAL STUDY TO ASSESS THE STATUS OF PERMANENT FIRST MANDIBULAR MOLAR TOOTH ERUPTION AMONG 6-7 YEAR OLD SCHOOL CHILDREN

<b>Dr. Eva Marker*</b>	B.D.S, M.Sc.(Med)Anatomy,Department of Anatomy, S.P. Medical College, Bikaner, Rajasthan, India. *Corresponding Author
<b>Dr. Kavita Pahuja</b>	Professor, Department of Anatomy, S.P. Medical College, Bikaner, Rajasthan, India.
<b>Vijay Kumar Dayma</b>	M.Sc.(Med)Anatomy,Department of Anatomy, S.P. Medical College, Bikaner, Rajasthan, India.

**ABSTRACT** The timing and sequence of eruption of permanent teeth are of great significance in children in relation to growth, development and management of dental problems. Premature eruption has been noted, but delayed tooth eruption (DTE) is the most commonly encountered deviation from normal eruption time. This study was aimed to understand the status of permanent tooth eruption in 6-7-years-old children. **Method:** This research was school based cross-sectional and co-relational data analysis. The study was conducted at Department of Anatomy, S.P. Medical College, Bikaner which included 456 children who were 6-7 years old studying in Government and Private schools of Bikaner city. The stratified random sampling method was used for sample selection. Subjects were examined to see the status of eruption of permanent mandibular first molar teeth.

**Conclusion :** In our study we observed that there is overall delay in tooth eruption among children of 6-7 years of age in government schools in comparison to private schools which could be due to differences in socioeconomic status and dietary intake, or other factors

**KEYWORDS :** 6-7-years-old children, permanent teeth eruption, delayed eruption.

### 1. INTRODUCTION

Dental eruption begins with the eruption of the first primary teeth around 6 months and finishes at 2 years and a half for primary teeth, and around 18-25 years for permanent teeth, when the third molar erupts. [1] Eruptive movement begins with the onset of root formation well before the appearance of tooth in the oral cavity and continues for as long as the tooth remains in the oral cavity. [2] Exfoliation of primary teeth and in turn the eruption of new teeth, is a constant age-related progression by which the teeth arise through the upper and lower jaws and the overlying mucosa to enter into the oral cavity and in turn occlude with the teeth of the opposite arch. [3]

The permanent teeth usually emerge between the ages of 6 -14 years, not including the 3rd molars that usually are seen emerging at the ages of 17-21 years. As teeth are the most stable structures in the human body, it can be of paramount importance in forensic medicine where estimation of age is usually required for criminal investigations and also in persons who do not have proper birth certificates whether above or below 18 years of age. [4]

Permanent first mandibular molars are the first permanent teeth to erupt in the oral cavity after the age of 5 years. The eruption age of the first permanent molar is one of the milestones by which the normal physical development of the child is evaluated. From clinical aspect, the specific standards on the timing and sequence of emergence of the permanent teeth represent an important resource for general dental practitioners and specialist involved in managing dental problems in growing children. Therefore, the timing and sequence of eruption of permanent teeth are of great significance in children in relation to growth, development and management of dental problems. [4]

True and significant deviations from accepted norms of eruption time are often observed in clinical practice. Premature eruption has been noted, but delayed tooth eruption (DTE) is the most commonly encountered deviation from normal eruption time.

In a number of studies it has been found that children from higher socioeconomic backgrounds show earlier tooth emergence than children from lower socioeconomic classes. [5] So, in the present study an attempt has been made to study the status of tooth eruption among school going children of Bikaner city.

### 2. MATERIALS AND METHOD

This was a School based cross-sectional study conducted in the Department of Anatomy, S. P. Medical College, Bikaner. In present study a total of 456 subjects with age ranging from 6 to 7 years were incorporated. All the subjects were school going children residing in

Bikaner, Rajasthan. Four schools were selected by using stratified random sampling technique and their status of eruption of permanent mandibular first molar tooth was recorded.

- Inclusion criteria were the subjects who were apparently healthy children with no facial and dental deformity evident, aged 6-7 years old, willing to take part in the study, got parental / guardian approval through the signing of an informed consent form. Exclusion criteria were those having evident dental deformity .

### 3. Sampling procedure:

On the basis of the date of birth of the subjects and taking the date of examination as the reference date, the age of the subjects were calculated. The examination was performed with the subject seated in an ordinary chair, ensuring good illumination. The oral cavity was examined using a sterile mouth mirror and William's probe and careful observation and palpation of alveolar ridges were done to evaluate and ensure tooth eruption. A permanent first mandibular molar tooth was recorded as erupted if any part of its crown, however small, had pierced the gingiva and appeared in the oral cavity. Gingival emergence was used as the criterion of the eruption. Only those cases were considered whose records were available for date of birth from school records. Children with growth or congenital anomalies or severe medical conditions and children who were absent on the day of examination were excluded.

### 4. DATA COLLECTION & ANALYSIS:

Data thus measured and collected from both groups of school children were compared by entering into excel sheet and was analysed with help of appropriate descriptive and analytical statistics and tests of significance. Chi square test was used to compare the proportions of subjects with erupted tooth verses those with non erupted tooth and  $p < 0.05$  was considered critical level of any statistical test to be significant.

### 5. OBSERVATION

In present study total 456 school children (231 from government & 225 from private school of Bikaner, Raj) of age group 6-7 years were incorporated. They were evaluated and examined for dental eruption of first permanent mandibular molar.

Following observations were recorded:-

**Table 1 Distribution of study population according to gender - (Government schools & Private schools)**

Gender	Government schools	Private schools
Girls	112	84
Boys	119	141
Total	231	225

**Table 2 Association of gender to status of eruption of permanent first mandibular molar tooth in study population of Government schools & Private schools**

Eruption	Government		Private	
	BOY	GIRL	BOY	GIRL
Erupted	67	61	103	64
Non Erupted	52	51	38	20
Total	119	112	141	84
P- Value	0.882		0.716	

**Table 3 Association of status of eruption of permanent first mandibular tooth in girls among study population of government and private schools**

Eruption	Government Girls		Private Girls		P value
	(n)	(%)	(n)	(%)	
Erupted	61	54.4	64	76.19	0.003*
Non Erupted	51	44.5	20	23.80	
Total	112	100%	84	100 %	

**Table 4 Association of status of eruption of permanent first mandibular tooth in boys among study population of government and private schools**

Eruption	Government Boys		Private Boys		P value
	(n)	(%)	(n)	(%)	
Erupted	67	56.30	103	73.04	0.007*
Non Erupted	52	43.69	38	26.95	
Total	119	100 %	141	100 %	

**Table 5 Association of status of eruption of permanent first mandibular tooth among study population of government and private schools**

Eruption	Government		Private		P value
	(n)	(%)	(n)	(%)	
Erupted	128	55.4	167	74.22	0.0001*
Non Erupted	103	44.58	58	25.77	
Total	231	100 %	225	100 %	

## 6. DISCUSSION

In our study a total of 456 children of the age group 6-7 years were enrolled, out of which 231 (50.6%) were from govt. schools and remaining 225 (49.4%) were from private schools. Whereas Billewicz WZ et al (1975)<sup>6</sup> and Tritratana T et al (1990)<sup>7</sup> observed children within the age range of 4.5-14 yr and 6-16 years. In our study among the 231 subjects were from govt. schools, majority were boys (51.5%) and 48.4 % were girls (Table 1). Out of the 225 pvt. school subjects, majority were boys (62.6 %) and 37.75 % were girls (Table 1). Similar results were also found by Lailasari D et al<sup>8</sup> in their study sample which consisted of 57 people consisting of 28 boys (49.1%) and 29 children (50.9%)

In our study out of total 231 govt. school subjects majority (55.4%) had their permanent first mandibular tooth erupted, while in remaining 44.58% study subjects eruption of permanent first mandibular tooth was not found.

Among the 225 pvt. school subjects majority 74.22% showed eruption of permanent first mandibular molar tooth whereas in 25.77 % the eruption of permanent first mandibular molar tooth was not found.

In our study, 74.22% of the pvt. school subjects showed eruption of permanent first mandibular tooth while, 54.4 % of govt. school subjects showed eruption of permanent first mandibular molar tooth, the reason for higher eruption amongst pvt. School subjects may be better nutritional capacity of families of subjects who are opting pvt. schools for education as compared to the families who are sending their children to govt. school. The results were in contrast to Kaur I et al (2010)<sup>9</sup> where he found no differences in dental eruptions between Govt. and Public schools.

In our study, out of total 231 govt. school subjects, majority of boys and girls 56.0% and 54.4% respectively showed eruption of permanent first mandibular molar tooth (Table 2) and amongst 225 pvt. School subjects majority of boys and girls 73.04% and 76.19% showed eruption of permanent first mandibular molar tooth, so there was no effect of gender difference observed in the status of eruption of permanent first mandibular molar tooth in both the sexes of both the schools. (Table 2). Demirjian A et al (1980)<sup>10</sup> found chronological similarity -between boys and girls in the early stages of development and the advancement of girls over boys for the later stages. Due to this

variation eruption is earlier in girls as compared to boys, similar variation showing girl subjects with earlier eruption was seen in our study (Table 3) while similarly the higher percentage and a higher number of girls with erupted permanent molar tooth was found in study conducted by Chaitanya P et al<sup>11</sup> (girls right side 84.9 ± 5.2, left side 83.4 ± 5.4, boys right side 83.9 ± 5.1, left side 82.6 ± 5.1 percentile) which was higher as compared to our study. The reason for this higher eruption may be because of the upper limit of age of subjects higher than that of our study, similar results were observed by Garcia-Godoy F et al<sup>12</sup> who also observed that girls were relatively advanced in their emergence times but the results were in contrast to Lailasari D et al<sup>8</sup> who observed that boys have an average number of eruptions of permanent teeth more than girls.

In our study we found that there was a highly significant association found between eruption of permanent first mandibular molar tooth (Table 5) among study population of both govt. and pvt. schools among boys subjects of both schools and girls subjects of both schools. (Table 3,4)

## 7. CONCLUSION

We found that among school going children of 6-7 year of age of Bikaner (Raj.), there is delayed tooth eruption of permanent mandibular first molar tooth in government schools subjects when compared to subjects of private schools. There was no effect of gender on status of eruption of permanent mandibular first molar tooth in subjects from government and private schools. Thus, it can be concluded that there is overall delay in tooth eruption among children of 6-7 years of age in government schools in comparison to private schools which could be due to differences in socioeconomic status and dietary intake, or other factors but an actual cause needs to be identified for which further studies can be conducted.

## 8. REFERENCES

- Jain A, Jain V, Suri S, Saxena A. The Study of Teeth eruption in Female Children of Malwa Region-A Correlation with age. IAIM, 2015; 2(2): 108-112.
- Mahmooda A, Hamid W, Jabbar A, Farooq A. Ages and sequence of eruption of permanent teeth in a sample of Pakistani school children POJ 2010; 2(2): 52-59.
- Hassan S, Shahid H. Assessment of eruption of permanent teeth according to age and its relation with body mass index in local population. J Pak Dent Assoc 2018; 27(3): 127-32.
- Khan NB, Chohan AN, Al Mograbi B, Zahid T, Al Moutairi M. Eruption time of the permanent first molars and incisor among a sample of Saudi male school children. Saudi Dent J 2006; 18: 18-24.
- Clements EMB, Davies-Thomas E, Pickett KG. Time of eruption of permanent teeth in British children in 1947-8. Br Med J. 1953; 1(4825): 1421-1424.
- Billewicz WZ, McGregor IA: eruption of permanent teeth in West African (Gambian) children in relation to age, sex and physique. Ann Human Biol 1975; 2(2): 117-28.
- Tritratana T, Hemindra, Kiatiparjuk C. Eruption of permanent teeth in malnourished children. J Dent Assoc Thai 1990; 40: 100-108.
- Lailasari D, Zenab Y, Herawati E, Wahyuni I. Correlation between permanent teeth eruption and nutrition status of 6-7-years-old children Padjadjaran J Dent. 2018; 30(2): 116-123.
- Kaur I, Singal P and Bhatnagar D.P. Timing of Permanent Teeth Emergence and Dental Caries among Jatsikh Children of Public and Government Schools of Patiala District Anthropologist, 2010; 12(2): 141-148.
- Demirjian A, Levesque GY. Sexual differences in dental development and prediction of emergence. J Dent Res 1980; 59: 1110-1122.
- Chaitanya P, Reddy JS, Suhasing K, Chandrika IH, Praveen D. Time and Eruption Sequence of Permanent Teeth in Hyderabad Children: A Descriptive Cross-sectional Study. Int J Clin Pediatr Dent 2018; 11(4): 330-337.
- Garcia-Godoy F, Diaz AN, Valle JMD, Arana EJ. Timing of permanent tooth emergence in a South Eastern. Dominican school children population sample. Community Dent Oral Epidemiol, 1982; 10: 43-46.