Age Estimation by Dental Eruption in Schoolchildren of 14-16 Years Age Group

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Abstract

The estimation of age is an important and is commonly carried in medico legal area. Assessment of age is often required while administering justice to an individual involved in the civil and the criminal litigation. Teeth are known to aid in personal identification and age estimation as they are highly durable and resist putrefaction, fire, chemicals etc. Objective: To study the status of dental eruption in schoolchildren of age group between 14- 16 years. The study was carried out involving 100 students of age group of 14-16 years from BGS High School, B G Nagara, Mandya District. Out of 100 subjects, 50 males and 50 females constituted the study population. In the present study, Upper jaw, on both right and left sides, there was no space behind 2nd molar tooth in 14 years males while space was present in one female of same age group. Only 1 male and 1 female of 15 years age group had developed space behind 2nd molar tooth. Considering the Lower jaw, space behind 2nd molar tooth was developed in 7 cases right side and 8 cases left side in case of 14 years boys. In case of girls of 14 years age it was present in 12 cases on right side and 9 cases on left side. In case of boys of 15 years, it was present in 18 cases on right side and 19 cases on left side. In case of girls of 15 years, it was present in 18 cases on right side and 20 cases on left side. The dental system is an integral part of the human body, its growth and development can be studied in parallel with other physiological maturity indicators such as bone age, menarche and height.

Keywords: *Age Estimation, Dental Eruption, 14-16 Years of Age group.*

Introduction

The estimation of age is an important and is commonly carried in medico legal area. Assessment of age is often required while administering justice to an individual involved in the civil and the criminal litigation. Teeth are known to aid in personal identification and age estimation as they are highly durable and resist putrefaction, fire, chemicals etc. Dental age estimation in the living is mostly based upon non-invasive methods, which evaluate the timing and sequence of defined growth stages of the developing dentition and the sequence or modification of traits in the mature dentition and the surrounding tissues. Eruption of teeth is one of the changes observed easily among the various dynamic changes that occur from the formation of teeth to the final shedding of teeth. The times of eruption of teeth are fairly constant and assessment of age of an individual by examination of teeth is one of the accepted methods of age determination. This fact can be made use of in ascertaining the average age of eruption of the tooth.[1]

It is well accepted by several authorities that the principal methods that enable one to give a fairly accurate range regarding the age of an individual are on the basis of appearance of secondary sexual characteristics, eruption of teeth. As determined by various studies so far in India, it is well known that there exists considerable variation in ossification of bones and teeth eruption in different regions of the country. So also there is divergence in the pattern of appearance of secondary sexual characteristics in various regions of our country and in different socio-economic groups.

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Examination of teeth is very important in medico legal cases as it helps in identification and age estimation of living as well as dead since the teeth resist putrefaction for a long time. From eruption of 20 temporary teeth, one can estimate approximate age from 6 months to 30 months. Temporary or deciduous teeth are replaced by 32 permanent teeth in later life which starts around 6th year. From eruption of first permanent molar until eruption of all the four permanent canines, it is called as period of mixed dentition. Teeth eruption is affected by climatic, racial, geographical factors. Also nutritional deficiency status and some diseases either delay eruption of teeth or may cause premature dentition.[2,3]

Objective

To study the status of dental eruption in schoolchildren of age group between 14- 16 years

Methodology

The study was carried out involving 100 students of age group of 14-16 years from BGS High School, B G Nagara, Mandya District. Out of 100 subjects, 50 males and 50 females constituted the study population.

Results

Table 1: Space behind Second Molar Tooth

	14 years		15 years	
	Male	**Female**	**Male**	**Female**
Right Upper Quadrant	0	1	1	1
Left Upper Quadrant	0	1	1	1
Right Lower Quadrant	7	12	18	18
Left Lower Quadrant	8	9	19	20

In the Upper jaw, on both right and left sides, there was no space behind 2nd molar tooth in 14 years males while space was present in one female of same age group. Only 1 male and 1 female of 15 years age group had developed space behind 2nd molar tooth.

Considering the Lower jaw, space behind 2nd molar tooth was developed in 7 cases right side and 8 cases left side in case of 14 years boys. In case of girls of 14 years age it was present in 12 cases on right side and 9 cases on left side. In case of boys of 15 years, it was present in 18 cases on right side and 19 cases on left side. In case of girls of 15 years, it was present in 18 cases on right side and 20 cases on left side.

Discussion

In the present study, Upper jaw, on both right and left sides, there was no space behind 2nd molar tooth in 14 years males while space was present in one female of same age group. Only 1 male and 1 female of 15 years age group had developed space behind 2nd molar tooth. Considering the Lower jaw, space behind 2nd molar tooth was developed in 7 cases right side and 8 cases left side in case of 14 years boys. In case of girls of 14 years age it was present in 12 cases on right side and 9 cases on left side. In case of boys of 15 years, it was present in 18 cases on right side and 19 cases on left side. In case of girls of 15 years, it was present in 18 cases on right side and 20 cases on left side.

Kumar and Sridhar studied a total of 1008 individuals in between 5 years –and 14 years of age residing in Tirupati, Andra Pradesh. This study was community based on eruption times of permanent teeth to establish age of the individual. The median age of the eruption was computed based on the concept of "Ex" which is defined as the age at which specified percent of individuals shows eruption of a given permanent tooth. The median age "E50" was computed by transforming of percentages to probits and plotting a graph between age and probits. The-individual's age can be computed according to E50 value of permanent tooth, which erupted last. Given individuals probability being above or below the assessed age can be estimated by referring to graph and probit transformation table.[1]

Helm and Prydso recorded permanent emergence of mandibular third molar at an early age of 14 years in 235 Danish Medieval skulls, 52 of whom were in various stages of mixed dentition. They argued that assessment of age at death could be made fairly accurately for the age group 5 to 30 years.[4]

Kaul *et al.* studied deciduous teeth emergence of 312 children aged 4 months to 31 months with Punjabi parenthood. For calculating medium age of tooth emergence, they used probit analysis. They found earlier tooth emergence in females than their male counterparts. In comparison with other population, it was found that in general, mean number of emerged teeth in Punjabi children is more at most ages and with lower medium age of eruption for most teeth. Variability in the eruption time was highest in 16-17 and 20-21 months. Thus, their study suggests that the number of teeth can be used as a parameter for estimation of age.[5]

Foti *et al.* studied for age determination both in living and dead children with the help of linear regression. The equation can be applied based on the number of erupted teeth and tooth germs detected during the clinical examination and radiograph. This equation helps in age estimation until 20 years of age.[6]

Conclusion

The dental system is an integral part of the human body, its growth and development can be studied in parallel with other physiological maturity indicators such as bone age, menarche and height. Several authors have shown that dental parameters are more suitable for age estimation in children because the variability is lower since calcification rates of teeth are more controlled by genes than by environmental factors. Rate of formation of the permanent teeth is not affected by premature loss of the primary teeth. Gingival emergence also called tooth eruption represents only one stage in the continuous process of dental eruption.

Ethical Clearance: Obtained from Institutional Ethical Committee

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Conflict of Interest: Nil

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