Year: 2014; Volume: 1; Issue: 1
Article ID: MD14 04; Pages: 1-7

BioMed Research

The Open Access Publisher

www.bmrjournals.com

BMR Medicine

Research Article

Estimation of Age by Eruption of Permanent Canine Tooth in Male Subjects of South Karnataka, Population

A.H. Shivakumar[1], G.M. Raju[2], Naseema Begum[1] and V Vijayanath[3]

[1]Department of Anatomy, S S I M S & R C NH-4 By Pass Road, Davangere – 577005

[2]Department of Forensic Medicine & Toxicology , J. J. M. Medical College, Davangere – 577004

[3]Department of Forensic Medicine and Toxicology, Vinayaka Mission's Kiruprnanda Variyar, Medical College and Hospital, Salem, Tamil Nadu, India

Correspondence should be addressed to V Vijayanath; drvijayanath@rediffmail.com

Received 12 March 2014; Accepted 25 March 2014; Published 30 March 2014

Abstract

Estimation of age from eruption of permanent canine tooth is an important parameter in Anthropology, Medico-legal cases, Judicians and Biology. The present study consists of 150 male subjects among the various schools of Davangere in South Karnataka. The age groups were 08-12 years. The aim of the study is to estimate the range of age from recent eruption of permanent canine tooth by their traits in right and left upper and lower quadrants and to compare the observation of various research studies who studied the eruption of permanent canine tooth in the past. Statistical analysis like range of age, mean and standard deviation were calculated. The present study revealed that the permanent canine tooth in the lower jaw eruption earlier than the upper jaw which was not highly significant (p value-0.62) in all the age groups between 08-12 years of age and erupted permanent canine tooth in the age group of 11 years was significant. No significant asymmetry in permanent teeth emergence time has been found between right and left sides of either jaw and it was found to erupt from eleventh to twelfth year of age.

Keywords: Age Estimation; Permanent canine tooth; Anthropology; Male children; South Karnataka;

Introduction

Adequate knowledge of timing and pattern of permanent teeth emergence is essential for diagnosis of developmental disturbance and treatment planning in (pediatric) dentistry, anthropological use and caries prevention programs. It is also useful in the field of surgery and for estimation of age in forensic expert. Age estimation for humans plays an important role in mass disasters and unaccompanied or seeking minors in the absence of proper documents. Variation more than one year in timing of tooth development could be the indicator of one disease in pediatric medicine and pediatric endocrinology.[1] Hence scientific

determination of age is very important. Age estimation using teeth is one among them. Teeth are the most indestructible part of the body and exhibit the least turnover of natural structure, and do not need special dissection. Hence teeth provide excellent material in living and non-living populations for anthropological, genetic, odontological and forensic investigations.[2]

Over the years, changes in sequence and time of tooth eruption are possible. The timing of tooth eruption is influenced by various factors: physiological factors (i.e. heredity, constitution, geographic factors, sex, race, nutrition, climate, urbanisation), pathological systemic factors (various diseases i.e. endocrine diseases, cerebral palsy, severe intoxications, severe renal diseases, genetic disorders) and pathological local factors (local eruption obstacles, hypodontia, lack of space).[3]

The purpose of this study is to determine the range of age in males from recent eruption of permanent canine tooth in both upper and lower quadrants of both the upper and lower jaw and to compare the observation of various research studies who studied eruption of canine tooth in the past.

Materials & Methods

Present study consisting of 150 male subjects of south Karnataka, between the age groups of 08 -12 years were carried out among the students of various schools to estimate the range of age by eruption of permanent canine tooth in right and left quadrants in both upper and lower jaw. Prior to procedure, informed written consent was obtained from school Head Master. The subjects in an age group of 08-12 years who were healthy & free from any congenital abnormalities, inflammation and trauma, related to canine tooth were examined.

Inclusion criteria: subjects who were willing to give voluntary consent in the age group between 08-12 years with recent erupted permanent canine tooth were included.

Exclusion criteria: subjects with missing canine tooth-dental brides & extraction and dental caries and who were on orthodontic treatment with fracture of canine tooth were excluded.

The present study cases were divided into age groups of 08-09 years, 09-10 years, 10-11 years, and 11-12 years. Their teeth were examined visually in good light using probe, spatula and mouth mirror for eruption. The teeth were examined by using a torch having a very fine focusing of light. The recent permanent canine tooth were identified by their traits on right and left quadrants in both upper and lower jaw. Then applying FDI, notation of dental chart was done.

Cross sectional data on permanent teeth eruption was collected by examining for gingival emergence: a tooth was considered emerged if any part of tooth has pierced the gum. Sex, age, locality (i.e. if they belonged to rural area or urban area) and the permanent canine teeth which were present at the time of examination were specifically recorded.

After examination of teeth, statistical tables were prepared for mean age, range and Standard deviation for eruption of each tooth in the upper and lower jaw and also for right and left quadrants of the same jaw and a comparison was done for eruption of teeth in upper and lower jaw, and the data was then statistically analyzed to know if the difference found was significant or not.

Results

TABLE 1: Number of permanent canine tooth appeared in different quadrants among 08-12 years of age groups.

AGE IN YRS	SEX	UR*	UL*	LR*	LL*
8	MALE	0	0	0	0
9	MALE	0	0	0	0
10	MALE	3	4	10	9
11	MALE	14	20	33	33
12	MALE	43	43	46	46

Table 1: UR*-Upper Right quadrant, UL*-Upper Left quadrant, LL*-Lower Left quadrant & LR*-Lower Right quadrant.

Chart: 1 Number of permanent canine tooth appeared in different quadrants among 08-12 years of age groups.

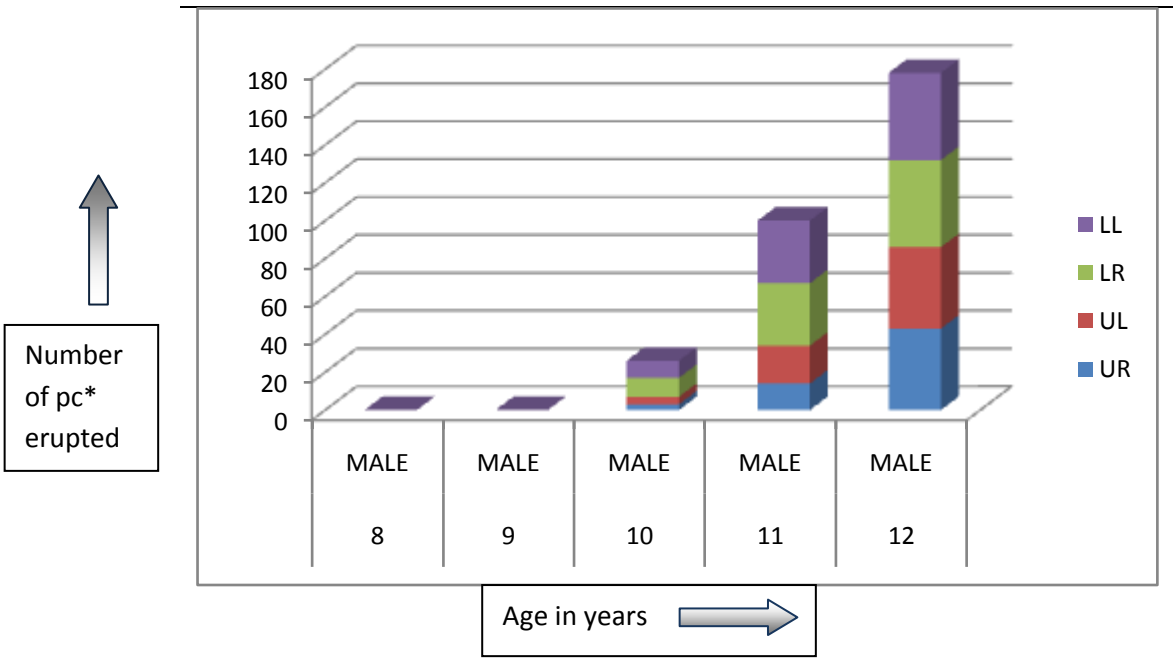

CHART 1: PC*-Permanent Canine tooth, UR*-Upper Right quadrant UL*-Upper Left quadrant LL*-Lower Left quadrant & LR*-Lower Right quadrant.

TABLE 2: Number of permanent canine tooth appeared in upper jaw and lower jaw among 08-12 years of age groups and p value.

AGE	SEX	UJ	LJ	P* value, sig
8	MALE	0	0	-
9	MALE	0	0	-
10	MALE	7	19	0.62
11	MALE	34	66	0.62
12	MALE	86	92	0.62

Table 2: UJ*-Upper Jaw & LJ* - Lower Jaw

upper jaw & lower jaw among 08-12 years of age groups.

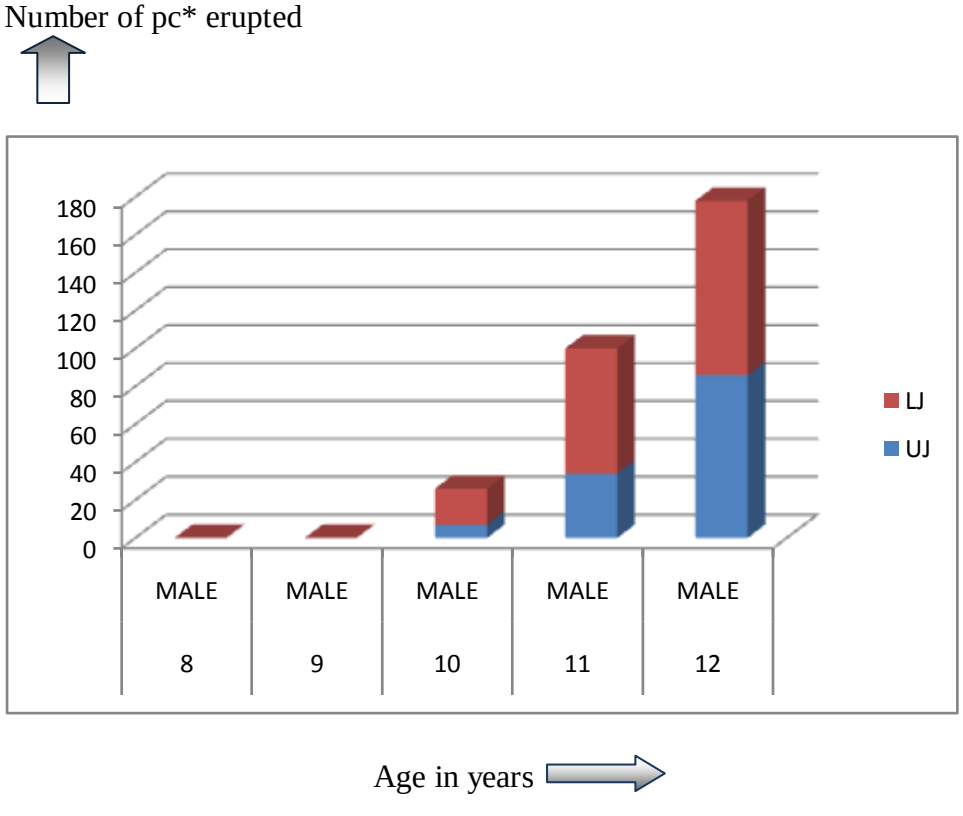

CHART 2: UJ*-Upper Jaw & LJ* - Lower Jaw, PC*-Permanent Canine

TABLE 3: Total number of erupted & non erupted permanent canine tooth, percentage & p -value in different age groups

AGE IN YRS	SEX	Erupted	Not Erupted	P value	Sig*
8	MALE	0	0	-	-
9	MALE	0	0	-	-
10	MALE	26 (28)	66(72)	0.07	NS
11	MALE	100(66)	52(34)	0.03	S
12	MALE	178(95)	10(5)	0.1	NS

TABLE 3: Sig*- Significance, NS-Not Significant & S- Significant.

CHART 3: Total number of erupted & non erupted permanent canine tooth, percentage & p value in different age groups shown in bar diagram.

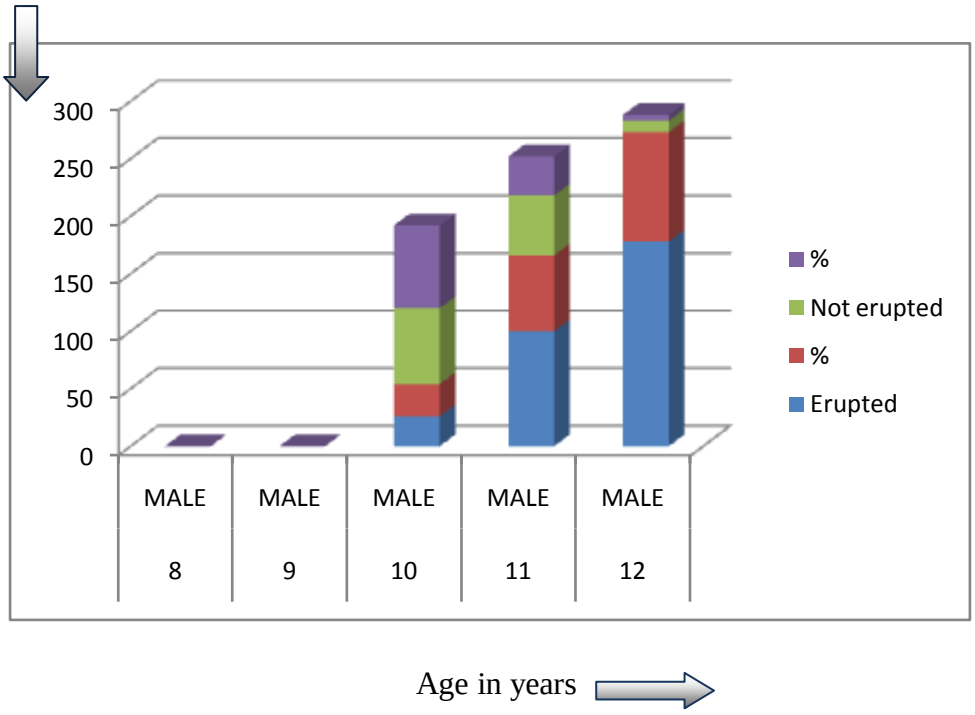

CHART: 3: %- Percentage, PC-Permanent Canine

Results

It was observed that the eruption of permanent canine tooth in lower right quadrant occurs first, followed by lower left quadrant, upper left quadrant and in upper right quadrant during 11-12 years of age. The permanent canine tooth erupted almost at the same time on either side of the same jaw and it was found to erupt from eleventh to twelfth year of age.

The overall sequence concluded that the permanent canines in the lower jaw eruption earlier than the upper jaw which was not highly significant (p- value-0.62) in all the age groups between 08-12 years of age.

The eruption of permanent canine teeth was found to be 28% in the age group of 10 years, 66% in the age group of 11 years and 95% in the age group of 12 years. It was observed that erupted permanent canine tooth in the age group of 11 years was significant.

Discussion

Age estimation is important for law enforcing agencies in matters like criminal responsibilities, identification, consent, criminal abortion, employment, attainment of majority, and during retirement. Hence scientific determination of age is very important. Age estimation using teeth is one among them. Teeth are the most indestructible part of the body and exhibit the least turnover of natural structure. Hence teeth provide excellent material in living and non-living populations for anthropological, genetic, odontological and forensic investigation.

Time of emergence of teeth (mean age of eruption) depends on wide physiological individual variability depending on heredity, constitution, geographic factors, sex, race, nutrition, climate, urbanisation. Different populations have been assessed to determine the average time of eruption of permanent teeth. Although the period during which the permanent teeth erupted was similar in both sexes (06-12 years) teething order was different[2]

Present study consisting of 150 male subjects of south Karnataka, between the age groups of 08 -12 years were carried out among the students of various schools to estimate the range of age by eruption of permanent canine tooth in both upper and lower quadrants in both upper and lower jaw

We studied the sequence of eruption of permanent canine tooth in different quadrants in both upper and lower jaw on the day of examination. It was observed that the eruption of permanent canine tooth in lower right quadrant occurs first, followed by lower left quadrant, upper left quadrant and in upper right quadrant during 11-12 years of age which was found to be similar to the findings of KK Agarwal et al[3]. The permanent canine tooth erupted almost at the same time on either side of the same jaw. Similar to the findings of Billewicz et al [4] who also found that there was no difference between eruption ages of homologous permanent teeth on the left and the right side of the same jaw and similar were the findings of Kochhar & Richardson.[5] These findings were very similar to the study by Grewal [6] who found that the canines erupt from eleventh to twelfth year of age.

The overall sequence concluded that the permanent canines in the lower jaw appeared earlier than the upper jaw which was not highly significant (p- value-0.62) in all the age groups between 08-12 years of age.

The eruption of permanent canine teeth was found to be 28% in the age group of 10 years, 66% in the age group of 11 years and 95% in the age group of 12 years. It was observed that erupted permanent canine tooth in the age group of 11 years was significant and found to be similar with the findings of KK Agarwal et al [3] .Thus; the permanent canine teeth erupted earlier in the lower quadrants than in upper quadrants.

Conclusion

The sequence of eruption of permanent canine tooth in lower right quadrant occurs first, followed by lower left quadrant, upper left quadrant and in upper right quadrant. The permanent canine tooth erupted almost at the same time on either side of the same jaw No significant asymmetry in permanent teeth emergence time has been found between right and left sides of either jaw and it was found to erupt from eleventh to twelfth year of age.

The overall sequence concluded that the permanent canines in the lower jaw appeared earlier than the upper jaw which was not highly significant (p value-0.62) in all the age groups between 08-12 years of age and erupted permanent canine tooth in the age group of 11 years was significant.

References

1. Ana emilia ogodescu, et al. Up-to-date standards of permanent tooth eruption in Romanian children. Journal pediatr Dent.2011; 14: 53-4.

2. Feraruion-victor. Sequence and chronology of the eruption of the permanent canines and premolars in Romanian children. Romanian Journal of oral rehabilitation. 2011; 3(3):36-44.

3. Aggarwal KK, Amandeep kaur, Rakesh kumar. Chronological pattern of eruption of permanent teeth in the adolescent age group in patiala district, Punjab. J. Punjab Acad. Forensic Med. Toxicol. 2011; 11(1): 12-19.

4. Billewicz WZ, McGregor IA. Eruption of permanent teeth in West African (Gambian) children in relation to age, sex and physique. Ann Hum Biol 1975; 2(2):117-28.

5. Kochhar R, Richardson A. The chronology and sequence of eruption of human permanent teeth in Northern Ireland. Int J. Paediatr Dent. 1998; 8(4): 243-52.

6. Grewal RS. Medical Jurisprudence and Toxicology. 1st Edn. Calcutta, India: Scientific Book Agency; 1973: 40-41.