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RESEARCH ARTICLE

Changing trends in tooth eruption-survey among children of Mangalore, India

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Abstract

Individuals from different ethnic and racial groups exhibit different variations in eruption patterns and timing of eruption of individual teeth. Such variations need to be analyzed and should form the basis for developing a new standard table for tooth eruption customized to the population in which they are to be applied.

Aim of the study: The aim of the present study was to evaluate the timing and sequence of eruption of deciduous teeth among children of Mangalore city, India

Material and methods: The study was done on 565 children, aged between 6 and 48 months. Dental recordings were made using the Federation Dentaire International (FDI) tooth notation system. All the data were compiled and tabulated using SPSS software package version 11. The Student t' test was used to assess the significance of difference in the mean age of tooth eruption.

Results: There was no significant difference between the right and left quadrants and between boys and girls for both maxilla and mandible. First tooth to erupt was at the age of 13.5 ± 1.5 months. In the deciduous dentition all the teeth had erupted into the oral cavity by 39 months of age, the maxillary lateral incisors and first molars had erupted before their mandibular counterparts, while the reverse was true in case of mandibular central incisors, canines and second molars.

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INTRODUCTION

Tooth eruption marks a milestone in a child's development^[1,2] and is synchronous with growth and development of the craniofacial complex^[3]. Estimation of dental age is an important tool for planning treatment and forms a valuable asset in diagnosis and treatment planning during the developmental years^[4,5].

In routine clinical practice it has been observed that the timing of deciduous tooth eruption varies greatly when compared with the standard table of chronology (Figure 1), as given by Logan and Kronfeld and modified by McCall and Schour^[6] in 1940. Studies have shown that individuals from different ethnic and racial groups not only exhibit different variations in growth and development, but also show variations in eruption pattern and timing of individual teeth^[7-10].

Keeping this in mind, the present study was contemplated with the purpose of evaluating the timing and sequence of eruption of deciduous teeth among children of Mangalore city, Karnataka State (India) compared to the standard data.

AIMS

To evaluate the timing and sequence of eruption of deciduous teeth among children of Mangalore city, India.

OBJECTIVES

1. To determine the timing of eruption of deciduous teeth
2. To determine the sequence of eruption of deciduous teeth
3. To compare the timing and sequence of eruption of deciduous teeth with the standard data.

MATERIAL AND METHODS

The present study was carried out on 565 children (296 boys and 269 girls), aged between 6 and 48 months, were local residents (born and brought up) and who visited our hospital for immunization and other needs.

Ethical Committee Clearance was obtained from the Institutional Ethics Committee. Informed consent from one of the parent was also obtained before examination.

Exclusion criteria: Children with a history of developmental disorder or severe medical illness.

A tooth was considered to be erupted when any part of it had erupted through the gingiva and could be seen and touched. Dental recordings were made using the Federation Dentaire International (FDI) tooth notation system. All the data were compiled and tabulated using the SPSS software package version 11. Comparison was made between the data obtained and the standard tooth eruption table ^[6].

The Student t' test was used to assess the significance of difference in the mean age of tooth eruption.

RESULTS

Children were grouped based on their age and ranged from 6 to 48 months (Table 1). Table 2 shows the eruption timing of all deciduous teeth in boys and girls. There was no significant difference between the right and left quadrants and also between boys and girls for both maxilla and mandible. The right side was considered for the purpose of comparison with standard data (Table 3). The mandibular central incisor was the first deciduous tooth to erupt at the age of 13.5 ± 1.5 months and the last tooth to erupt into the oral cavity was the maxillary second molar at 36 ± 3 months. Figure 2 shows the sequence of eruption of deciduous tooth in the study sample compared to the standard data. The length of time from the eruption of first to the last deciduous tooth was on an average 22.5 months both in maxilla and mandible.

Table 1: Sample distribution based on age and gender

Age (Months)	Boys	Girls	Total
6-12	54	36	90
13-24	82	74	156
25-36	83	74	157
37-48	77	85	162
Total	296	269	565

Table 2: The eruption timing for all deciduous teeth in boys and girls

Tooth No.	Eruption Age in Boys (Months)	Eruption Age in Girls (Months)	Eruption Age For the entire sample (Months)
55	33-39	34-39	33-39
65	32-37	33-37	32-37
54	18-25	18-23	18-25
64	18-25	21-25	18-25
53	24-28	24-29	24-29
63	22-28	23-26	22-28
52	13-18	12-18	12-18
62	14-18	14-18	14-18
51	12-17	12-15	12-17
61	12-17	12-17	12-17
75	30-35	31-35	30-35
85	34-36	34-36	34-36
74	21-23	21-25	21-25
84	21-23	22-25	21-25
73	23-28	22-28	22-28
83	23-29	24-28	23-29
72	14-21	17-21	14-21
82	14-21	14-21	14-21
71	12-15	12-15	12-15
81	12-15	12-13	12-15

Table 3: Comparison between the eruption timing of the study sample and standard data

Tooth	Study Sample (months)	Standard Eruption Data (months)	Difference (months)
51	14.5	7.5	7
52	15	9	6
53	26.5	18	8.5
54	21.5	14	7.5
55	36	24	12
85	35	20	15
84	23	12	11
83	26	16	10
82	17.5	7	10.5
81	13.5	6	7.5

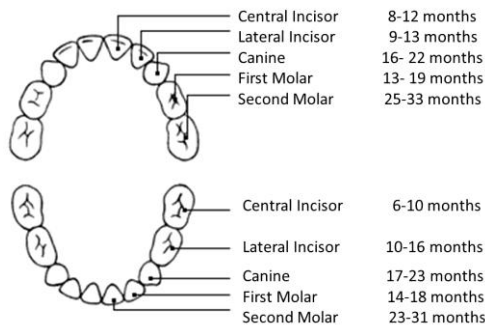


Figure 1: Standard table of chronology by Logan and Kronfeld and modified by McCall and Schour^[6]

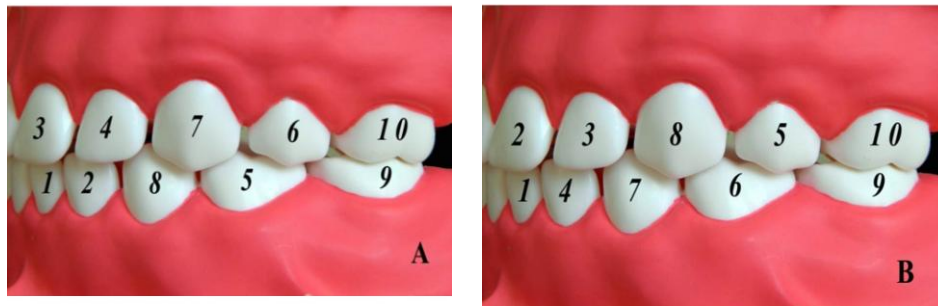


Figure 2: Sequence of eruption of deciduous teeth
 A. Standard data
 B. Study data

DISCUSSION

Tooth eruption is influenced by many factors. Some are individual factors such as nutritional and endocrinal factors and some are demographic^[11]. Dental age estimation has long been an anthropological fascination besides being a clinicians tool^[12]. Studies have also shown that racial and demographic difference influence the timing of tooth eruption^[13].

The purpose of this study was to evaluate the timing and sequence of eruption of primary teeth in children of Mangalore city.

There was no significant difference between the eruption timing in boys and girls for both maxilla and mandible. Therefore the combined average for the entire sample was considered. Similar results were obtained in other studies also with no difference in the eruption timing between girls and boys^[14,15].

The finding of the present study definitely deviates to a great extent from the standard norms (Table 3). The first tooth erupted into the oral cavity at an average age of thirteen and a half months compared to the standard data (mandibular central incisors erupted at six months). Subsequently there was a significant delay and the deciduous dentition completed eruption at about thirty six months.

In the present study, it took a period of four months for the eruption of all the incisors followed by a gap of another four months for the eruption of the first molar. Canines erupted about three months after eruption of the first molars. A long gap of eight and a half months was observed before the eruption of second molar at the age of thirty six months.

As per the standard chronology chart^[6], eruption of incisors are complete by nine months of age. This is followed by the eruption of mandibular first molar at twelve months (after 3 months interval) and maxillary first molar at fourteen months. Mandibular canines erupt after a gap of another two months. The second molars erupt at twenty

months, first the mandibular followed by the maxillary molars. The total period taken for the eruption of deciduous teeth as per the standard data is 18 months.

In a study by Narinder et al^[16] conducted in Amristar, India, the average age of eruption of central incisors was 8.67 months and the deciduous dentition completely erupted by 30 months.

In Nepal^[15] it was found that the first deciduous tooth, the maxillary central incisor erupted at the age of 11 months followed by the maxillary and mandibular lateral incisors. There also was a change in the sequence of eruption with both maxillary (15.29 months) and mandibular (15.22 months) first molars erupting earlier to canines (maxillary canine 19 months and mandibular canine-21.44 months). In the same study the length of time from eruption of first to the last tooth was 14 months and 14.83 months respectively in maxilla and mandible in boys and 14.7 and 17.5 months respectively in girls. However the eruption period of the present study group was longer covering twenty two and a half months.

In the present study, maxillary lateral incisors and first molars erupted before their mandibular counterparts. But the reverse was observed in relation to central incisors, canines and second molars where the mandibular teeth erupted before their maxillary counterpart. Results from other studies^[3,4,17] are in accordance with respect to the lateral incisors and first molars in the present study. Except for the mandibular central incisors that erupted first and the second molars that erupted last, there was a complete change in the sequence of eruption in the present study compared to the standard data. Logan and Kronfeld^[18], in their study, reported that mandibular central incisors and second molars erupted before their maxillary counterparts, findings similar to the present study.

Meredith^[19] found that teeth erupt earlier in boys compared to girls, while others^[20] found the reverse to be true. In the present study there was no difference in the eruption timing between boys and girls.

Teeth help in identification as well as estimation of age. Tooth eruption is affected by various factors. It is not correct to apply the same data to the whole of the country or the World. India is a very big country, with different climates, making it necessary to have different eruption standards for different parts of the country. Therefore each place should have its own standard data, so that it can be effectively applied not only for planning dental treatment but also in the diagnosis and prevention of dental disease, as well as in anthropological research and forensic dentistry.

SUMMARY

1. First tooth to erupt was at the age of 13.5 ± 1.5 months. 50% of the sample had their first tooth at twelve months and 100% of the children had their mandibular central incisor by the age of 17 months.
2. 50% of the children had all their deciduous teeth by 33 months and 100% of them at 39 months of age.
3. In 50% of the children the period of eruption of deciduous dentition was found to be 21 months whereas when all the children were considered, the mean was found to be 22 months.
4. No difference in eruption pattern between left and right side or between boys and girls was observed.
5. Maxillary lateral incisors and first molars erupted before their mandibular counterparts, while the reverse was true in case of central incisors, canines and second molars where the mandibular teeth erupted first.

In the present study, a great deviation in the eruption timing and sequence of eruption was noticed and hence it is important that the standards for tooth eruption be derived from the population to which they are to be applied.

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