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A CLINICAL ASSESSMENT OF CHANGE IN DRIFT IN ERUPTION SEQUENCE OF PRIMARY TEETH AMONG INFANTS OF PATNA CITY – A CLINICAL STUDY

Dr. Mantasha Khan[1], Dr. Ali Khan*[2], Dr. Tejas Kadam[3], Dr. Dhanshri Khade[4], Dr. Chaitrali Lakade[5], Dr. Varsha Uraiti[6]

[1]Intern Patna Dental College and Hospital Patna, Bihar.
[2]PGMO District Hospital Sagar Madhya Pradesh.
[3]Assistant Professor, Dept of Oral and Maxillofacial Surgery Sinhagad Dental College and Hospital Pune Maharashtra.
[4]Assistant Professor, Dept of Pediatrics and Preventive Dentistry Sinhagad Dental College and Hospital Pune, Maharashtra.
[5]Assistant Professor, Dept of Periodontology and Implantolgy Sinhagad Dental College and Hospital Pune, Maharashtra.
[6]Post Graduate Student, Dept of Public health Dentistry Bhabha College of Dental Sciences Bhopal, Madhya Pradesh.

***Corresponding Author: Dr. Ali Khan**
PGMO District Hospital Sagar Madhya Pradesh.

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ABSTRACT

Eruption is often used to indicate the timing of emergence of the tooth into the mouth. The normal eruption of primary and permanent teeth into the oral cavity occurs over a wide chronologic age range. The normal development of the craniofacial complex is strongly influenced by the physiologic process of eruption of teeth.[1] Tooth eruption is a complex and tightly synchonized process which is divided into five stages namely pre-eruptive stage, intraosseous stage, mucosal penetration, preocclusal and postocclusal stages.[2] **Material and Method:** A predesigned questionnaire along with an informed consent was given to the mother of the child determining the general information, socioeconomic status, weight so as to assess the possible etiological factors which might be responsible for delayed eruption of primary teeth. **Results and Conclusion:** The data collected were statistically analyzed and it was observed that significant relation exists between tooth eruption and birth weight gender time period , Based on the findings, it may be stated that Indian infants showed delayed eruption of deciduous teeth when compared with infants of different countries.

KEYWORDS: Eruption, Primary tooth, Infant.

INTRODUCTION

Deciduous teeth or primary teeth are the first set of teeth in the growth development of an individual. They develop during the embryonic stage of development starts at the sixth week of tooth development as the dental lamina, there are ten buds present on the upper and lower arches that will ultimately become the primary dentition. These teeth will continue to form until they erupt and become visible in the oral cavity during infancy, there are a total of twenty teeth[4] Eruption of primary teeth, their exfoliation followed by eruption of permanent dentition is an orderly sequential and age specific event. But most parents are concened about the variation in the timing of the eruption, which is regarded as an important milestone during child's development.[2]

Delayed tooth eruption (DTE) is the most commonly seen deviation from normal eruption time.[1] Accurate diagnosis, overall treatment planning, and timing of treatment for the orthodontic patient can be directly affected by the delay in eruption of teeth. Thus, delayed tooth eruption can have a significant impact on a patient's proper health care.[1]

Micronutrient deficiency can directly affect matrix secretion in the hard tissues of the teeth and consequently disturb the continuation of dental formation and mineralization. The most essential minerals that form the hydroxyapatite crystals of enamelare calcium and phosphorus; hence, hypocalcaemia and hypophosphatemia can lead to impaired mineralization and delayed eruption of teeth.[11,9]

In addition to genetic factors, environmental factors such as maternal smoking, height and weight of a newborn at the time of birth and nutrition status have been shown to play a role in the eruption of the first primary tooth.[4]

Therefore, the aim of the study is to evaluate the factors affecting the eruption of first primary teeth in infants aged 6 months.

AIM AND OBJECTIVES

Aim:

The clinical assessment of change in drift in eruption sequence of primary teeth among infants of Patna city.

Objectives:

- To determine the eruption time of 1st primary teeth at 6 months
- To determine weight of the infants and eruption time

Study Design and Setting

The study was observational in nature and the data was collected from children aged 6 months with their mothers visiting the Pediatric Department of the selected government and private hospitals in patna city. A predesigned questionnaire along with an informed consent was given to the mother of the child determining the general information, socioeconomic status, weight, etc. to assess the possible etiological factors which might be responsible for delayed eruption of primary teeth

Statistical analysis

The data obtained was subjected to statistical analysis with the consult of a statistician The total data was subdivided and distributed meaningfully and presented as individual tables along with graphs.

Statistical procedures were carried out in two steps:

1. Data Compilation and Presentation
2. Statistical analysis

Statistical analysis was done using Statistical Packages of Social Science (SPSS version 22.0: Chicago Inc., USA. Significance level was fixed at $P \leq 0.05$.

RESULTS

The present survey was conducted with an aim of evaluating the changing trends in eruption sequence of primary teeth among the infants of patna city. Children aged 6 to 8 months were included in the study. Total 138 patients were included. They were divided into two groups on the basis of eruption of first primary tooth i.e. Group 1 with Delayed eruption and Group 2 with non-delayed eruption of first primary teeth.

Table 1: Time period of tooth eruption in oral cavity.

Group	At 6 months	After 6 Month
Dealayed	0	108
Not delayed	30	0
Total	30	108

Table 1 shows the eruption timing of 1st primary tooth in the study participants. There were 48 teeth in non-delayed eruption group in which first primary tooth erupted at 6 month of age. In the delayed eruption group ,90 patients first primary tooth erupted between 7to 8 month of age

Table 2: Comparison of eruption of tooth on the basis of gender.

Groups	Female	Male	Chi square value	P value
Delayed	32	76	9.41	0.006*
Not delayed	22	8		
Total	54	84		

Table 2 depicts the comparison of eruption of first primary tooth on the basis of gender. There were 32 females and 76 males in the delayed eruption group while there were 22 females and 8 males in the non-delayed eruption group. Chi square test was applied to find the difference in gender regarding the delayed eruption. There was significant difference with respect to gender with chi square value 9.41 and p value 0.006.

Table 3: Comparison of delayed eruption with weight of the child at birth

Groups	1-2 kg	2-2.5 Kg	2.5-3 kg	> 3 kg	Chi square value	P value
Delayed	75	28	3	2	6.43	0.042*
Not delayed	4	20	4	2		
Total	79	48	7	4		

Table 3 shows the comparison of delayed eruption with weight of the child at birth. There were 75 patients with birth weight between 1-2 kg, 28 children between 2-2.5kg, 3 children with birth weight 2.5-3kg and 2 children with birth weight greater than 3 kg in delayed eruption group while there were 4 patients with birth weight between 1-2 kg and 20 children between 2-2.5kg and 4 children with birth weight 2.5-3kg and 2 children with birth weight greater than 3 kg in non-delayed eruption group. Chi square test was applied to find the correlation of low birth weight with delayed eruption of first primary tooth and it was found that there was significant difference with respect to gender with chi square value 6.43 and p value 0.001. There was

significantly more prevalence of normal birth weight in non-delayed eruption group while in delayed eruption group there were high prevalence of low birth weight. (Table 6)

Table no. 4: Effect of Pre term birth on eruption of teeth.

Groups	Yes	No	Chi square value	P value
Delayed	6	102	0.87	0.35
Not delayed	0	30		
Total	6	132		

The effect of Preterm birth with delayed eruption was compared with the eruption of teeth. In delayed eruption group, there were 6 children with pre term birth while there were no children in the non-delayed group. Chi square value was 0.87 and p value was 0.35 which denotes that there was no significant difference between the groups. (Table 4)

DISCUSSION

The eruption of first deciduous teeth is an important event in a child's development process which occurs usually at the age of 6 months.[1] In the clinical practice significant deviation has been observed in the eruption timing from the accepted norms. Delayed tooth eruption is the most commonly encountered deviation from regular eruption.

Variations in the eruption timing of the first primary tooth (ETFPT) are considered multifactorial. Eruption is under strong genetic control, and the estimated narrow-sense heritability is over 70%.[13]

However, external environmental factors also make significant contribution to the timing of the primary tooth eruption. Maternal exposure to tobacco during pregnancy[25,26] infant birth weight[27,17] gestational age[28] method of infant feeding[23] and socioeconomic situation[29] have been reported to be significant determinants of the eruption of primary teeth. Delayed tooth eruption has also been reported in premature infants.[28,30]

There is definite evidence that children in different geographic regions have different eruption timing of the primary teeth.[31,14] The study result shows that, there was a significant association of gender with delayed eruption of teeth. Males showed significantly more delayed tooth eruption in comparison to females. There were 32 females and 76 males in the delayed eruption group while there were 22 females and 8 males in the non-delayed eruption group. (Table 2)

The present study result shows that there was significant difference in eruption of first primary teeth with respect to gender. The eruption was delayed in males in comparison to the females. The result of the present study was confirmed by the previous studies by Poureslami H et al,[8] Wu H et al,[32] Soliman N et al[33] and Holoman DJ et al.[14] However the study by Un Lam, C. et al.[19] in Singapore did not find a sex-related difference.

The study done by Poureslami H et al[8] argued that the timing of eruption of first primary tooth was significantly earlier in girls than in boys ($p = 0.02$). According to their study the eruption time for the first primary tooth was 8.5±3.2 months for boys and 6.9 ± 2.9 months for girls.

The study done by Viscardi et al[30] had found that, the delayed eruption was greater in females in comparison to males but only premature infant were included in his study.

Ntani G et al[34] found significant difference in first primary tooth eruption between males and females. In males, the mean time for eruption of first primary tooth was 30.1±9.4 weeks while in females it was 30.9±9.4 weeks.

The present study confirms that children with birth weights less than 2 kg are at increased risk for delayed eruption of the first primary tooth. The result has been confirmed form the previous studies done by Viscardi M et al,[30] Seow Wk et al[37] and Ramos et al.[15]

This positive relation between tooth eruption and body growth was also observed by Seow et al,[20] who compared the average eruption timing between low birth weight and normal birth weight infants and concluded that the eruption of first primary tooth occurred significantly earlier in normal birth weight infants.

Andrade and Bezerra[38] in 1998 did not find any delay in the chronology of eruption of deciduous teeth in high-risk infants and low birth weight infants (weight inferior to 2,500g). However, they attributed this circumstance to the fact that they did not study infants whose birth weight was very low. They studied only infants with low birth weight and normal birth weight who did not show any difference in eruption.

According to Noren et al,[39] low birth weight infants comprises approximately 6% of all live births and are usually pre term infants and argued that when corrected age was used, there was no significant differences on the time of eruption, indicating that preterm infants whose birth weight is very low may have the eruption of their first deciduous tooth delayed because of their preterm births and not due to a delay in dental development.

The effect of preterm birth shows non-significant difference when delayed eruption of primary teeth was

compared with gestational age of the child. In delayed eruption group, there were 6 children with preterm birth, while there were no children in non-delayed group. (Table 4)

The result of the present study was not comparable with the result of the study done by Wu H et al.[32] who had found a significant association of delayed eruption of first primary teeth with gestation period. Similar to the present study Viscardi et al.[30] did not find any significant effect of gestational age with the delayed eruption of primary teeth.

The present study a cross-sectional study design and its limits for the causal hypothesis test. In spite of the limitations, this study suggests that gender, birth weight may be important predictors for the children's first deciduous teething eruption time in their early childhood. In addition to the factors used in our study, few studies have shown that the effect of environmental factors such as maternal smoking, height and weight of a new born at the time of birth and nutrition status have shown to play a role in the eruption of the first primary tooth.

There is a need of further evaluation of delayed eruption with involvement of other factors and further experimental studies should be carried out in order to find correlation of different factors with the delayed eruption of first primary teeth

CONCLUSION

Based on the results obtained in the present study, the following conclusions were reached:

- A significant correlation was found between the gender of infants and the time of eruption of the first deciduous tooth. There was significantly more prevalence of delayed eruption of primary teeth among males in comparison to females.
- Very low birth weight infants showed a significant delay in the eruption of the first deciduous tooth when compared to normal birth weight infants.

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