Eruption time of the first Primary Tooth and its Relationship with Growth Parameters in Children

Original Article

Vejdani Javaneh [1], Heidarzade Abtin [2], Ebrahimi Darkhaneh Seyed Mohammad [3]

[1] Assistant Professor, Oro-Maxillofacial Developmental Disease Research Center, Department of Pediatric Dentistry, Guilan University of Medical Sciences, Dental School, Rasht, Iran
[2] MD, MPH, Associate Professor of Community Medicine, Guilan University of Medical Sciences, Rasht, Iran
[3] Dentist, Guilan University of Medical Sciences, Dental School, Rasht, Iran

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Corresponding Author:
Javaneh Vejdani
Address:
Oro-Maxillofacial Developmental Disease Research Center, Department of Pediatric Dentistry, Faculty of Dentistry, The end of Professor Samii Blv, Guilan University of medical sciences complex, Dental School, Rasht, Iran.
Email: jvejdani@yahoo.com
Telephone:+981333486406

Abstract

Introdouction:
Tooth eruption is recognized as an important aspect of human growth and development. It can be influenced by a number of factors, and it may reflect the general development of a child's body. The purpose of this study was to determine the age at which the first primary tooth erupted and its relationship with height, weight and head circumference in 3-15-month children in the city of Rasht,Iran.

Materials and methods:
This descriptive, cross-sectional study was conducted on 648 children (288 girls and 360 boys) aged between 3–15 months, which were randomly selected from all health care centers in Rasht (the children visit these centers regularly for vaccinations). Height, weight, and head circumference were measured on the same day. From the obtained data, descriptive statistical indices were calculated for the eruption time of the primary central incisors. Cox regression analysis was used to determine the relationship between tooth eruption and the three growth parameters.

Results:
The timing of the eruption of the first primary tooth ranged from 5 to 14 months. The first erupted tooth was the mandibular central incisor, with the mean age of eruption of 9.93 ± 0.11 months in girls and 10.13 ± 0.1 months in boys. There was a significant association between the eruption time of the first primary tooth and weight-for-age in both girls and boys. The relationships of first primary tooth eruption with head circumference-for-age and height-for-age were significant only in boys.

Conclusion:
The first primary tooth erupted earlier in girls than in boys, and primary tooth eruption was significantly related to the measured growth parameters, i.e., height, weight, and head circumference.

Key words:
•Pediatric Dentistry •Tooth Eruption •Tooth •Deciduous

Introduction

Eruption of the first primary tooth in the oral cavity at the age of 6 to 10 months is an important event in the development of a child.[1] Major deviation from this physiological trend may lead to suspicion of an underlying disease in the child. This subsequently causes anxiety for parents and can result in the need for further investigation involving techniques such as radiography. A change to the eruption timing of the first primary tooth has been observed in the present generation.[1]

There is a delayed eruption of primary teeth. Timing of eruption of first primary teeth was 8.08 months for boys and 7.88 months for girls in Indian population.

Tooth eruption is recognized as an important aspect of human growth and development, and it can be influenced by a number of factors. For example, it may reflect the general development of the human body.[2] Factors such as genetics, hormones, ethnic-racial-geographic differences, nutritional indices, and gender differences can also affect the eruption of teeth.[3] Some studies have shown that, in the same age groups, eruption occurs later in children below standard height and weight than those within the standard range. The effect of pituitary growth and thyroid hormones on the eruption of teeth has also been demonstrated.[4-6]

A change in the timing of tooth eruption is one of the indicators of malnutrition during child development. Many studies have demonstrated the relationship between early childhood malnutrition and eruption of primary teeth [7–11]; however, this relationship was not observed in all studies.[12, 13]

The development of primary teeth in humans is a complex process, which is thought to be controlled primarily by genetic factors.[14] There is a wide age range for the eruption of teeth, and some studies suggest that primary tooth eruption is related to a child's weight after birth rather than its weight at birth.[11, 15]

Given the importance of the eruption timing of the first primary tooth, this study aims to determine the relationship between eruption timing and growth parameters, namely height, weight, and head circumference, in children aged 3-15 months from the city of Rasht, Iran.

Materials and Methods

In this descriptive, cross-sectional study, 648 children aged 3–15 months were selected according to cluster random sampling from seven health centers in Rasht. This age range was selected because children of this age group are easily accessible in health centers, which they visit for vaccinations. Only healthy, normal subjects were included in the study sample.

To gather data, observations were made and interview techniques were used to complete questionnaires. The eruption time of the first primary tooth was the main variable, whereas the age, gender, height, weight, and head circumference of the child, as well as their use of iron supplements, were measured as underlying variables. Examination of the children was performed in conditions with sufficient light using disposable tongue blades and gloves. Observation of a tooth in the oral cavity signified that a tooth had erupted. Height, weight, and head circumference were measured on the same day that the children were examined.

Nurses used standardized techniques and equipment to weigh children and measure their height and head circumference.[7] Each child was weighed with minimal clothing. Children were weighed either lying down or sitting on a leveled pan scale. Body length was measured from head to heels (to the nearest mm) using an infantometer. The growth parameters were selected according to WHO standards and the centers for disease control 2000 reference charts.[16]

Statistical analysis was performed in SPSS version 10. Kaplan-Meier and survival analyses, as well as descriptive statistics, were used to determine the mean eruption time of the first erupted tooth. Backward conditional Cox regression was used to determine the relationship between the underlying factors and eruption of primary teeth.

Results

Of the 648 children examined in this study, 288 (44.5%) were female and 360 (55.5%) were male. The first erupted tooth in children was the mandibular primary central incisor, The mean age of eruption obtained from the present study in girls was 9.93 ± 0.11 months and in boys was 10.13 ± 0.1 months. lThe age range of eruption

of this tooth was 5- 14 months. Table 1 shows the mean age of eruption of the first primary tooth in children according to their weight/age index. In boys with a weight/age index <5%, the mean age of eruption of the mandibular centrals was 12.1 ± 0.21 months. For those boys with a weight/age index from 5% to 50%, the mean age of eruption was 10.82 ± 0.17 months, and where their weight/age index ranged from 50% to 95%, it was 9.43 ± 0.23 months. In boys with the ideal development pattern (i.e., those with a weight/age index >95%), the mean age of eruption was 8.15 ± 0.55 months. In girls, the primary teeth erupted earlier when the child was heavier.

Table 1. Mean± SD age of eruption of the first primary teeth in children according to their weight/age index

Weight/age	Boys		Girls	
	A	A	A	A
*<5%	12.1 ±0.21	12.1 ±0.21	11.25 ±0.89	11.52 ±0.89
5–50%	10.84 ±0.17	10.81 ±0.17	10.19 ±0.23	10.21 ±0.23
50–95%	9.51 ±0.23	9.35 ±0.23	10.23 ±0.21	10.18 ±0.21
>95%	8.36 ±0.62	7.97 ±0.51	7.99 ±0.33	7.87 ±0.30
P Value	0.0002	0.0001	0.001	0.001

Table 2. Mean and SD time until the first primary tooth eruption in children according to their height/age index

Height/age	Boys		Girls	
	A	A	A	A
*<5%	11.38±0.44	11.38±0.44	10.37±0.62	10.37±0.62
5–50%	10.48±0.25	10.47±0.25	9.37±0.36	9.22±0.38
50–95%	9.94±0.21	9.74±0.21	10.07±0.22	10.01±0.22
>95%	9.97±0.42	9.76±0.44	9.89±0.32	9.71±0.33
P Value	0.076	0.027	0.235	0.182

Table 3 shows the mean age of eruption of the first primary tooth according to head circumference in girls and boys. An increase in the head circumference/age index was associated with earlier eruption of primary teeth in boys.
In addition, the use of iron supplements was found to have a significant relationship with the eruption of the first primary tooth (P = 0.0001).

Table 2. Mean and SD time until the first primary tooth eruption in children according to their height/age index

Head circumference/ age	Boys		Girls	
	A	A	A	A
*<5%	11.12±0.33	11.28±0.32	10.12±0.89	10.11±0.90
5–50%	9.91±0.21	9.77±0.21	10.14±0.27	10.14±0.27
50–95%	10.11±0.26	9.82±0.48	9.69±0.23	9.50±0.23
>95%	10.24±0.70	10.24±0.70	10.36±0.37	10.36±0.37
P Value	0.006	0.0008	0.220	0.179

Discussion

The present study showed that 3–15 month-old children in Rasht, had delayed eruption of their primary teeth according to the Law & Lunt standard table.[4] In developing countries, malnutrition might be one of the reasons that such a delay could occur. For example, in a study from Peru, delayed eruption of primary teeth was associated with malnutrition.[17]

The present study also demonstrated that the eruption time of mandibular central incisors occurred earlier in girls than in boys in Rasht. A similar finding was reported in a study from Jordan, although the difference between girls and boys was not significant.[18] In contrast, a study in Pakistan found no difference between the eruption times of primary teeth in girls and boys[19], whereas a study in Korea reported that primary teeth erupted earlier in boys than in girls.[20]The results of the latter two studies disagree with the findings in the present study.We observed no significant differences in the eruption times of teeth in left and right side of the dental arch; there was symmetry of eruption similar to that found in many other studies.[3, 11, 21]

A significant relationship between the earlier eruption of primary teeth and the weight/age index, as well as the head circumference index (in boys only), was observed in the present study. The height/age index was also associated with the eruption of the first primary tooth in boys, but there was no such association in girls. A similar result was observed in a study from Mexico, where overweight children were found to have more erupted teeth.[22] In a study from Turkey, the age range for eruption of the first primary tooth was 4–13 months, and development indices were shown to affect this eruption.[21]

In a Spanish study, the number of erupted teeth in a 9-month period was significantly related to weight and height indices in 2-year-old children.[23]Furthermore, according to a study in Brazil, the height index of a child was related to the number of erupted teeth.[11] In an American study, eruption of primary teeth in boys was related to weight rather than height, and this relationship was reversed in girls.[7] Additionally, the relationship between head circumference and eruption of primary teeth was more prominent in boys than in girls, which is in agreement with the results of the present study.

The majority of previous studies suggest that there is a significant relationship between the eruption of primary teeth and the general development of children. The results of the present study add further evidence and support for these findings. Since the height, weight, and head circumference of a child are all related to its nutrition, the results of this study suggest that eruption of primary teeth may be indicative of a child's nutritional status. Finally, delayed eruption of primary teeth has also been observed in preterm infants with low birth weight [10], and reduced head circumference and brain development in children that suffer severe malnutrition can also affect eruption of primary teeth.

Conclusion

1.In the present study, the first erupted primary tooth was the mandibular central incisor, with the mean age of eruption of 9.93 ± 0.11 months in girls and 10.13 ± 0.1 months in boys.

2.The weight/age index was significantly related to the eruption of primary teeth, and eruption occurred earlier with an improvement in this index.

3.The relationships between the height/age and head circumference/age indices and the eruption of primary teeth were more prominent in boys than in girls.

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