J Oral Res
oral and craniofacial sciences

Article

Factors influencing eruption time of first deciduous tooth.

Factores influyentes en el periodo de erupción del primer diente primario.

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Receipt: 10/10/2018 Revised: 05/17/2019
Acceptance: 07/02/2019 Online: 10/08/2019

Abstract: Introduction: Deciduous teeth play an important role in proper growth. Tooth eruption is a complicated process in which different mechanisms are involved. Early or delayed tooth eruption depends on different factors, with the impact of some already established. There are apparent controversy regarding the effect of some factors on time of the first deciduous tooth eruption among the conducted studies. The current study aimed to evaluate factors affecting the time of the first deciduous tooth eruption. Materials and Methods: One hundred and sixty eligible infants referring to the healthcare centers of Tabriz, Iran, were randomly selected; the demographic data including weight and height at birth, head circumference, mother's age and level of education, birth rank in the family and type of feeding were recorded, in addition to the time of the first deciduous tooth eruption. Data were analyzed using SPSS version 21 by ANOVA and t test.Results: Out of 54.1% female and 45.9% male participating infants, 78.3% had normal weight at birth. Results showed a significant relationship between weight at birth and timing of the first deciduous tooth eruption, among the evaluated factors. Conclusions: Although no significant relationship was observed between gender, type of feeding, mother's level of education and birth rank in the family, and time of the first deciduous tooth eruption, there was a significant relationship between the weight at birth and the timing of the first deciduous tooth eruption. Infants with higher or lower abnormal weight at birth had delayed deciduous tooth eruption.

Keywords: Tooth; deciduous; tooth eruption; analysis of variance; infant; humans; mothers.

Resumen: Introducción: los dientes primarios juegan un papel importante en el crecimiento adecuado. La erupción dental es un proceso complexo en el que intervienen diferentes mecanismos. La erupción temprana o tardía de los dientes depende de diferentes factores, con el impacto de algunos ya establecido. Existe controversia entre los estudios realizados con respecto al efecto de algunos factores que afectan la erupción del primero diente primario. El presente estudio tuvo como objetivo evaluar los factores que afectan el periodo de erupción del primero diente primario o temporal. Materiales y Métodos: Ciento sesenta bebés referidos a los centros de salud de Tabriz, Irán, fueron seleccionados al azar; Se registraron los datos demográficos, incluidos el peso y la estatura al nacer, la circunferencia de la cabeza, la edad y el nivel de educación de la madre, el rango de nacimiento en la familia y el tipo de alimentación, además del momento de la primera erupción del diente primario. Los datos fueron analizados por ANOVA y t-test utilizando SPSS versión 21. Resultados: de los lactantes participantes (54,1% femeninos, 45,9% masculinos) el 78,3% tenía peso normal al nacer. Entre los factores evaluados, los resultados mostraron una relación significativa entre el peso al nacer y el momento de la erupción del primero diente primario. Conclusiones: aunque no se observó una relación significativa entre sexo, tipo de alimentación, nivel de educación de la madre y rango de nacimiento en la familia, y el period de erupción del primero diente primario, hubo una relación significativa entre el peso al nacer y el momento de la primera erupción dental decidua. En los lactantes con peso anormal al nacer se había retrasado la primera erupción de los dientes primarios.

Palabras Clave: *Diente Primario; erupción dental; análisis de varianza; lactante; humanos; madres.*

Cite as:
Zarabadipour M, Vahdat G, Fallahzadeh F & Khani R. Factors influencing eruption time of first deciduous tooth.
J Oral Res 2019; 8(4):305-309.
Doi:10.17126/joralres.2019.045

INTRODUCTION.

The term *"deciduous teeth"* is derived from a Latin word, which means falling. In other words, deciduous teeth fall, and are replaced by permanent teeth. Deciduous teeth are also called temporary teeth, which may indoctrinate people that these teeth are not important.[1,2]

Deciduous teeth play an important role in child growth and development. In addition to the role of deciduous teeth in aesthetics, speech and function, they are also important to reserve the place for the teeth that follow.[3] The deciduous teeth are the only teeth in a child´s mouth up to age of six years and have 8 and 7.6 years of functionality in the upper and lower maxilla, respectively, on average.[4]

Tooth eruption is a physiological process which may cause a set of concurrent local symptoms such as increased salivation, inflammation and swelling of the gums, and systemic symptoms such as malaise, anorexia, fever and diarrhea. Most of the times, local symptoms are more common compared with systemic symptoms.[5-8]

Most of the parents are anxious regarding the time of first deciduous tooth eruption. Different papers introduced various factors involved; for example, Gaur *et al.,*[9] Martin-Moreno *et al.,*[10] and Ukpong *et al.,*[11] reported that time of the first deciduous tooth eruption depends on the type of feeding. Billewicz *et al.,*[12] Zadzinska *et al.,*[13] Chio *et al.,*[14] and Oziegbo *et al.,*[15] in different studies reported that the gender of infant can affect the timing of first deciduous tooth eruption.

Although there are contradictions among the results of these studies, factors such as mother's level of education, birth rank in the family and height and weight at birth, mother's age at delivery and many other ones are postulated to affect the time of the first deciduous tooth eruption.[16-21]

The current study aimed to evaluate the factors that may affect the timing of first deciduous tooth eruption.

MATERIALS AND METHODS.

To conduct the current study, 160 term infants (no premature births, no jaundice at birth, no congenital diseases or syndromes, no neonatal type 1 diabetes) were randomly selected from the infants referred to the healthcare centers of Tabriz, Iran, (Feburary 2015 to June 2015) for the monthly well-child care visits, which include evaluations of height, weight and vaccinations at sixth, 12th and 21st months. Incidence of systemic diseases of the mother such as gestational diabetes, hypothyroidism, hypertension, during pregnancy were used as exclusion criteria. Timing of the first deciduous tooth eruption was extracted from the infants physical examination form using a questionnaire applied to parents.

Other data such as weight at birth, sex, mother's age at birth, birth rank in the family, type of feeding, height and head circumference, and also the mother's level of education were separately extracted from subjects' health records at the healthcare centers. Final data were analyzed by SPSS version 21. The study was approved by the ethical committee of Qazvin University of Medical Sciences, record IR.QUMS.REC.1394.515.

RESULTS.

Out of the subjects in the current study, 54.1% were female and 45.9% male (normal gender distribution); 78.3% had normal weight at birth (2500-3500g), while 8.8% were under 2500g and 12.9% were over 3500g. Most of the subjects in the current study (83.4%) were breastfed and the others were formula-fed. (Table 1) shows the distribution of mother's level of education.

Among the subjects of the current study, 59.4% were the first child, followed by 33.5% and 7.1% as second and third children, respectively. Descriptive findings such as weight, height, head circumference, mother's age at birth, and time of the first deciduous tooth eruption. (Table2)

There was no significant difference between the mean time of eruption of the first deciduous tooth and the sex of subjects according to the t-test analysis (p=0.4) as the time of the first deciduous tooth eruption was similar in both genders. The relationship between variables such as height, head circumference and age of mother at birth, and time of the first deciduous tooth eruption was analyzed using Pearson correlation coefficient. (Table 3)

Data analysis indicated no significant relationship

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between the height, head circumference and age of mother at birth, and time of the first deciduous tooth eruption. The relationship between the weight of subjects at birth and time of the first deciduous tooth eruption was analyzed by ANOVA. (Table 4)

Data analysis showed that subjects with normal weight had normal timing for the eruption of the first deciduous tooth compared with those in the low-weight and high-weight groups. Comparing the timing of eruption of the first deciduous tooth with birth rank at family by ANOVA indicated no significant difference between the variables (p=0.17).

Table 1. Distribution of mother's level of education.

Mother's level of education	Number	Percentage
Elementary	25	14.7
High school	21	12.4
Diploma	48	34.1
Associate's degree	14	8.2
Bachelor's degree	41	24.1
Master's Degree	11	6.5

Table 2. Descriptive findings.

Variant	Minimum	Maximum	Mean	Standard division
Weight (gr)	1800	4400	3105	423
Height (cm)	45	54	49.5	1.5
head circumference (cm)	31	42	35	1.2
Mother's age (year)	17	43	27	5
Time of first deciduous teeth eruption (month)	1	13	8.6	2.4

Table 3. Relationship between variants and Time of first deciduous teeth eruption

Variant	*p*-value	r
Height (cm)	0.97	0.002
head circumference (cm)	0.91	-0.008
Mother's age (year)	0.27	-0.085

Table 4. Relationship between time of the first deciduous teeth eruption and weight at birth.

Weight	Mean	Standard division	F	*p*-value
Less than 2500	8.8	2.7		
2500-3500	8.3	2.3	4.1	0.018
More than 3500	9.9	2.1		

DISCUSSION.

Tooth eruption is a multifactorial complex process. Timing of the first tooth eruption is under the influence of several factors such as diseases, hormones, nutritional conditions, among others.[7] Delayed eruption of the first deciduous tooth can cause nutritional consequences for the children, in addition to worrying parents. The tooth eruption pattern is different among communities, and different studies have postulated different factors in this regard such as genetic, hormonal, ethnic, racial and geographical differences, economic status, growth indices, nutrition and sex.[15,21]

In the current study, no relationship was observed between gender and timing of the first deciduous tooth eruption, in agreement with the results of Neto *et al.,*[22] Blewicz *et al.,*[12] indicated that girls, whereas, Zadzinska *et al.,*[13] Chio *et al.,*[14] and Oziegbo *et al.,*[15] reported that the eruption of the first deciduous tooth was earlier in boys; differences between their findings may result from ethnic differences among the studied populations. According to the results of the current study, there was no relationship between the type of feeding and timing of eruption of the first deciduous tooth, which was similar to the findings of Folayan *et al.,*[23] while according to Martin-Moreno *et al.,*[10] breastfeeding can change the pattern of the first deciduous tooth eruption. Ukpong *et al.,*[11] also indicated that breastfeeding up to 15 months can accelerate tooth eruption. No similar study was found in available databases that assessed the effect of mother's level of education on the timing of the first deciduous tooth eruption. But a few studies have indicated that the mother's level of education can affect her knowledge regarding oral health and child health.[13,16]

According to the study by Baykan *et al.,*[16] the birth rank can affect the timing of the first deciduous tooth eruption, in contrast with the findings of the current study; this difference may result from population differences. There was no significant relationship between height and head circumference of infants, mother's age at birth and timing of the first deciduous tooth eruption in the current study, which was similar to the findings of Kutesa *et al.,*[18] Vojdani*et al.*[20] On the other hand, Soliman *et al.,*[17] Sujlana *et al.,*[24] Oziegbo *et al.,*[15] reported a positive relationship between the height of infants and the number of erupted teeth.[17] The study by Vojdani *et al.,*[20] showed no positive relationship between mother's age at birth, gender of infant, type of delivery, height and head circumference of infant at birth, and time of the first deciduous tooth eruption.

The current study showed a significant difference between weight at birth and timing of eruption of the first deciduous tooth in the studied subjects; that is, infants with higher and lower than normal weight had delayed deciduous tooth eruption. It could indicate that the eruption of primary teeth would be affected by low birth weight, like other tissues, organs and bones. The pathogenesis is multifactorial but factors such as hospitalization, daily weight gain, vitamin supplementation and other systemic problems may play a role.[22] This result was in disagreement with the findings of Infante *et al.,*[25] who found no relationship between an infant's weight at birth and the timing of eruption of the first deciduous tooth based on the periodic examinations on infants who were under 2000g at birth.

In a cohort study by Shajari *et al.,*[26] in Shariati Hospital in Tehran, Iran, no significant difference was observed in the timing of the first deciduous tooth eruption among infants with different weights at birth. The study by Ramos *et al.,*[27] also indicated no delay in the eruption of the first deciduous tooth in lower than normal weight and full term infants. Also, Sajadian *et al.,*[21] report a negative relationship between the weight at birth and time of the first deciduous tooth eruption; that is, infants with lower than normal weight had delayed deciduous tooth eruption. A study by Fadavi *et al.,*[28] also showed delayed deciduous tooth eruption in infants with lower than normal weight. Kutesa *et al.,*[18] and Oziegba *et al.,*[15] reported an impact of weight at birth on the timing of the first deciduous tooth eruption.

CONCLUSION.

Based on the results of the current study, no signi-ficant relationship was observed between infant sex, mother's level of education, birth rank in the family, height and head circumference at birth and mother's weight at birth, and the timing of the first deciduous tooth eruption, but there was a significant relationship between weight at birth and the timing of the first deciduous tooth eruption. Infants with higher or lower than normal weight at birth showed delayed deciduous tooth eruption.

Conflict of interests: All authors declare that there is no conflict of interests.

Ethics approval: This study approved by ethical committee of Qazvin University of Medical Sciences with ethical number of IR.QUMS.REC.1394.515. There is no conflict with ethical considerations.

Funding: None.

Authors' contributions: Zarabadipour M designed the

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study. Vahdat G and Khani R collected and analyzed the data. Zarabadipour M prepared the manuscript. Zarabadipour M and Fallahzadeh F edited and reviewed the manuscript. All authors read and approved the manuscript.

Acknowledgements: None.

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