

A Changing Trend In Eruption Age and Pattern of First Deciduous Tooth: Correlation to Feeding Pattern

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ABSTRACT

Background: Feeding mode during infancy and its effect on deciduous tooth appearance in oral cavity in two generations and among genders.

Aim and Objective: Study aimed to compare and correlate times and patterns of deciduous tooth eruption in breastfeeding (OBF), partial breastfeeding (PBF) and spoon feeding (SF) infants and initiation of semisolid food feeding (SSF) in infants. It also aimed to address the variations in the time of eruption of first deciduous tooth and its pattern in two generations who had more than a decade of difference in ages.

Materials and methods: An open-ended questionnaire study was conducted on mothers of 265 patients from two groups, generation 1 (G1)- adults who were aged 20-35 years and second group, generation 2 (G2) - children who were below 5 years of age.

Results: A statistical significance was observed with respect to age, gender, generations, and frequency of breastfeeding, partial breastfeeding and time of initiation of semisolid food.

Conclusion: There is a delayed eruption of teeth in present generation. For girls, it occurs at age of 7.88 months and for boys, it occurs at the age of 8.08 months.

Keywords: Deciduous teeth, Eruption time, Eruption trend, Breastfeeding, Feeding

INTRODUCTION

Eruption of first deciduous tooth in oral cavity teeth at the age of six to ten months is an important event in a child's development [1]. Literatures suggest that there is a correlation of the dental age with the chronological age of a child [2,3]. Failure of eruption or delayed eruption suggests many underlying pathologies [4]. This will lead to futile investigations like intra-oral radiographic examinations which are done for determining the cause of the delay in eruption of the first teeth [5]. Several evolutionary changes are observed in human dentition [2,5] eruption may also be show some changes over a period of time [5,6]. A change in the timing of eruption of first deciduous tooth has been observed in the present generation [7-9].

Infants and babies will gradually shift from exclusive breastfeeding or only breast feeding to partial breastfeeding. Later on, they will shift to spoon feeding, followed by semisolid food in the first few years of their lives. Exclusive breastfeeding and partial breastfeeding habits have many impacts on orofacial development and eruption of deciduous and permanent dentitions [4,10 -12].

Current study was carried out to find out whether there were changes in eruption times and patterns of first deciduous teeth, in two generations who had over a decade's age difference between them. We also aimed to check for any correlation of infant feeding patterns on appearance of deciduous teeth in oral cavity. We could not find any study which was done on changing trends in eruption times and patterns of first deciduous teeth in present generation among Indian population.

METHODOLOGY

A cross-sectional, open ended questionnaire study was conducted from 2010 to 2012 in a private hospital in Vadodara, Gujarat, India. Two hundred and sixty-five mothers belonging to Gujarat state participated in the study. Questionnaires included vital statistics and mothers' medical histories during their pregnancies, childbirth and their nutritional statuses.

The following questions were asked on infants feeding habits:

FI	Age (Years)			Duration of Only Breast Feeding (Weeks)			Frequency of Only Breast Feeding (Time/Day)			Duration of Partial Breast Feeding (Weeks)			Frequency of Feeding During Partial Breast Feeding (Time/Day)			Spoon Feeding (Weeks)			Semi Solid Food (Weeks)		
	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value
G1B	34.2	9.47		12.3	8.58		2.86	0.88		15.43	6.22		5.33	2.54		8.16	5.14		8.96	4.99	
G1G	30.39	5.74		9.18	5.58		3.44	0.96		16.14	10.76		3.88	1.55		8.74	5.48		9.82	4.15	
G2B	3.68	1.47		15.88	8.99		2.84	0.84		14.75	14.22		6.58	2.97		7.68	2.04		8.42	2.31	
G2G	2.68	1.39		12.88	5.55		3.04	1.59		14.12	15.56		4.82	1.59		8.96	6.12		11.18	4.19	
Generation ^s			0.0000*			0.0010*			0.2021			0.6072			0.0185*			0.8529			0.4729
Gender ^s			0.0029*			0.0055*			0.0181*			0.988			0.0007*			0.1856			0.0017*
Generation vs Gender [#]			0.0795			0.956			0.2486			0.798			0.7385			0.6177			0.0972

[Table/Fig-1]: Table showing mean and SD of various parameters according to generation and gender and comparison done by ANOVA two way interaction (generation and gender)

^s ANOVA; [#] Two way interaction; *statistically significant; FI, Factors and interaction; G1B, Generation 1 Boys; G1G, Generation 1 Girls; G2B, Generation 2 Boys; G2G, Generation 2 Girls

FI	Age (Years)				Duration of Breast Feeding (Weeks)				Frequency of Breast Feeding (Times/Day)				Duration of Bottle Feeding (Weeks)				Duration of Bottle Feeding (Weeks)				Spoon Feeding (Weeks)	
	G1B	G1G	G2B	G2G	G1B	G1G	G2B	G2G	G1B	G1G	G2B	G2G	G1B	G1G	G2B	G2G	G1B	G1G	G2B	G2G	G1B	G1G
G1B	-				-				-								-				-	
G1G	0.0007*	-			0.0429*	-			0.0329*	-			0.8481				0.0688	-			0.558	-
G2B	0.0000*	0.0000*	-		0.0528	0.0001*	-		0.9309	0.0472*	-		0.8551	0.9254			0.0565	0.0005*	-		0.6278	0.5324
G2G	0.0000*	0.0000*	0.3737	-	0.7067	0.0432*	0.0516	-	0.4351	0.0848	0.661	-	0.9334	0.9474	0.8648		0.4329	0.1482	0.0211*	-	0.698	0.8242

[Table/Fig-2]: Comparison of interactions between generation and gender with respect to many parameters by Newman-Keuls multiple post hoc procedures
*statistically significant; FI, Factors and interaction; G1M, Generation 1 Boys; G1F, Generation 1 Girls; G2M, Generation 2 Boys; G2F, Generation 2 Girls

FI	First Erupted Tooth in Lower			First Erupted Tooth in Upper		
	Mean	SD	p-Value	Mean	SD	p-Value
G1B	6.82	1.33		6.36	0.84	
G1G	7.86	2.03		7.06	1.29	
G2B	9.84	2.53		8.08	1.93	
G2G	9.73	2.52		7.88	1.83	
Generation §			0			0.0001*
Gender §			0.4013			0.4146
Generation vs Gender #			0.2975			0.1439

[Table/Fig-3]: Table showing mean and SD of various parameters according to generation and gender and comparison done by ANOVA and Two way interaction (generation and gender)
§ ANOVA; # Two way interaction; *statistically significant; FI, Factors and interaction; G1B, Generation 1 Boys; G1G, Generation 1 Girls; G2B, Generation 2 Boys; G2G, Generation 2 Girls.

FI	First Erupted Tooth in Lower				First Erupted Tooth in Upper			
	G1B	G1G	G2B	G2G	G1B	G1G	G2B	G2G
G1B	-				-			
G1G	0.1845	-			0.1083	-		
G2B	0.0011*	0.0326*	-		0.0008*	0.0487*	-	
G2G	0.0010*	0.0180*	0.8854	-	0.0018*	0.0500*	0.6449	-

[Table/Fig-4]: Comparison of interactions between generation and gender with respect to many parameters by Newman-Keuls multiple post hoc procedures
*statistically significant; FI, Factors and interaction; G1B, Generation 1 Boys; G1G, Generation 1 Girls; G2B, Generation 2 Boys; G2G, Generation 2 Girls

Mode of feeding of the child:

1. Only breastfeeding: Duration (in weeks) and Frequency (times/day).

(Only breast milk feeding, no other liquids including water, by oral or intravenous routes, except medicated oral drops or medications).

2. Partial breast feeding: Duration (in weeks) and Frequency (times/day).

(Also known as bottle feeding, which was supplemental to breast milk, other milk and related products, given orally in liquid form).

3. Spoon feeding: Duration (in weeks).

(Feeding of milk and other milk related products orally with the help of spoon).

4. Semisolid food feeding: Duration (in weeks).

(Feeding with the help of spoon and other instruments and food being in semi solid form).

5. First tooth eruption: Upper teeth (months) and Lower teeth (months):

(Any tooth with any part of its crown penetrating the gingiva and/or which was visible in the oral cavity).

After 15 days, a structured interview was conducted for mothers, to validate the reliability of data provided to them, by a group of orthodontists and pedodontists. Questionnaires with conflicting

findings were excluded from the study. A systemic random sampling was done and data of a total of 200 patients were selected after obtaining their verbal consents, with equal generations and equal gender distributions. Ethical clearance was not mandatory, as the study was a questionnaire study.

SPSS, version 16.0 software was used for statistical analysis. A confidence interval of 95% and a level of 5% were set for carrying out statistical analysis. Mean and SD, Two-way ANOVA, comparison of interactions between generations and genders by doing Newman-Keuls multiple post-hoc procedures analysis, were used to derive results.

RESULTS

There were statistically significant differences in relation to age, generation and gender for feeding habits [Table/Fig-1], Similarly, by Newman-Keuls multiple post hoc method, statistically significant differences were observed within and among generations and genders [Table/Fig-2].

Statistically significant differences were observed for eruption times with respect to ages and genders [Table/Fig-3], as well as among genders of both generations [Table/Fig-4].

DISCUSSION

Every milestone of development in child is valuable clinical information for a clinician [13]. including eruption of first deciduous teeth [6]. These chronological milestones are influenced by many factors [4,6,14,15]. Any alteration in this physiological trend causes suspicion of an underlying disease [4]. This causes anxiety for parents and it leads to futile investigations such as radiographs, as most parents came for such self advised investigations. Local factors tend to be influenced by changing trends which are observed in environmental factors [10,11,16,17] which also vary between geographical areas, races and ethnicities [2, 6-8, 11,12].

Exclusive breastfeeding has an overall effect on growth and development of children [18]. Various studies have noted the effect of breastfeeding habits on orofacial development, including eruption of primary and permanent dentitions [16]. Larsson E [19] found that there was an increased dribble and biting or gnawing activity, especially around the eruption area during teething time. There were correlations between modes of feeding from breast to bottle to semisolid food in the development of cross bite.

Validity and reliability of data on feeding habits depend on mothers recall, short term memory is less reliable and optimal time is 36 months after birth of child [10,12,20]. Accurate information can also be obtained by doing a careful examination, even after 20 years [21, 22]. In the present study, among structured interviews and other check points which were used, a total of 200 (75%) from among 265 were found to be reliable.

We observed that current generation had increased breastfeeding durations, which were more in boys than in girls. This may be due to increased awareness and promotion of breast feeding by government and non government organizations. However, Folayan et al., [12] and Oziegbe et al., [10] did not find any link between teeth eruption timings and the durations of breastfeeding. We found that only breastfeeding frequencies had significant impact on timings

and patterns than durations of breastfeeding. A similar observation was made by Folyan et al., [11] in Nigerian population. There was a significant difference in the patterns of eruptions of maxillary and mandibular teeth in EBF and PBF. However, an increase in age of eruption was seen in PBF than in EBF [11,12]. We found that frequency of breastfeeding was less in boys in comparison to that in girls. There were changes in trends of feeding (OBF) among generations and over a decade's time, duration was increased but frequency had not changed much.

Partial breastfeeding duration was longer over a decade ago and it was more in girls than in boys. But a statistically significant difference could not be observed. However, mothers showed a positive response with respect to knowledge on breastfeeding. Frequency of PBF was found to be less a decade ago and it was also less in females than in males. Significant differences in generations and genders seen were comparable to those seen in Folyan et al., [12] study done on effect of breast feeding and in Larsson E [19] study done on development of cross bite, which were related to various habits. At the same time, we would like to add the other factors which were employed during or before deciduous teeth eruptions, all of which had some or other roles. However, the present study did not show any correlation with duration of PBF as well as SF.

Interestingly, spoon feeding coincided with teething time. In G1, eruption of upper tooth was observed during 6.69 ± 1.13 months and in G2, it was 7.98 ± 1.84 months. G2 revealed delayed eruptions of teeth in both upper and lower arches among both genders, as was observed. This observation correlated with findings seen in earlier literatures [6,11]. Overall, females showed earlier eruptions of both upper and lower teeth, which was comparable with Gupta et al., [8] finding. Despite the fact that more recent literature suggested secular trends and increased variances which were related to ethnic groups and socio-economic statuses [23], Woodroffe et al., [6], in their study, found delayed eruptions of teeth in present generation as compared to those seen in a previous study. They observed changes in 10, 20 and 30 years of difference also.

There were definite alterations in patterns, sequences and times of eruptions of deciduous teeth, and they were dependent on racial, genetic and environmental factors, including breast feeding habits [6,8,10-12,19] and even genetic influences [15]. This trend in delayed eruption was observed in Indian population also and it could be genetically influenced or could be caused by the effect of change in socio-economic status. However, eruption sequence was also altered and this was an interesting finding. This indicated a need for collection and preparation of dentition status, which evaluated the trends and patterns of teeth eruptions decade-wise, locally and globally.

CONCLUSION

Frequencies of various modes of feeding, breastfeeding, partial breastfeeding, including bottle feeding and the timings of initiation of soft food, have significant impacts on the timings and patterns of eruptions of first deciduous teeth. A delay in eruption age was seen; it was 8.08 months for boys and 7.88 for girls in Indian population.

Upper deciduous teeth erupt first in the oral cavity. Dentists and other medical and paramedical professionals, along with general public, should be made aware of the present trends and patterns of eruptions of deciduous teeth.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **July 16, 2013**
Date of Peer Review: **Dec 21, 2013**
Date of Acceptance: **Jan 20, 2014**
Date of Publishing: **Mar 15, 2014**