

Primary Dentition Eruption in Relation to Weight Status

Heba N. Yassin¹, Maryam Azat A. Rifat²

¹B.D.S. M.Sc. Assistant Lecturer, Department of Pedodontic and Preventive dentistry, College of Dentistry, University of Baghdad

²B.D.S, College of Dentistry, University of Baghdad

Abstract: Background: Nutrition and diet can affect the development and integrity of the oral cavity including the development and eruption of primary teeth. Aims of the study: The study was carried out to determine the effect of weight status of the child and gender on the number of deciduous teeth erupted in the oral cavity. Material and method: A children from the age 12 months -35 months attending Specialist Health Center and children of Nursery in Al-Khadraa, and nursery in Al- Aadamyia and Hay-Heteen. The number of teeth erupted, gender and body mass index were recorded. Results: The results showed that eruption of primary dentition was quicker in children who were overweight than those with normal weight and faster in girls than in boys in all age groups. Conclusion: The nutritional status has the better effect on the primary tooth eruption. There is acceleration in eruption of primary teeth in the girls than boys.

Keywords: Primary dentition, eruption, weight

1. Introduction

Deciduous teeth play an important role in the proper alignment, placing and occlusion of permanent teeth. The deciduous incisors are functional for approximately 5 years, while the deciduous molars remain functional for approximately 9 year^[1]. The calcification of deciduous teeth begins during the fourth prenatal month, and calcification of all deciduous teeth begins by the end of the sixth prenatal month^[2].

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^[3]. The number of erupted teeth has been considered as useful complementary data for evaluation of growth and development, especially when employed together with the measurements of height and weight^[4].

Deciduous dentition in child is not a simple matter, even though it is frequently held that the eruption of deciduous teeth in humans proceeds independently of nutritional status^[5]. However, there is additional evidence that maternal, socioeconomic and/or nutritional factors are also important in influencing the eruption of not only deciduous but also permanent^[6].

The Body Mass Index is a useful tool in both clinical and public health practice for assessing nutritional status^[7]. Nutritional deficiencies can lead to delays in the process of teeth eruption^[8]. 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^[9].

Because there are few Iraqi studies concerning the relationship between nutritional status and teeth eruption for primary dentition it was decided to conduct this study in order to assess the influence of weight status on primary teeth emergence.

2. Materials and Methods

A sample of [140] with an age range of [12-35] months, of both gender [66 boys, 74 girls] participated in this study. The sample was selected from group of children attending Specialist Health Center and children of Nursery in Al-Khadraa, and nursery in Al- Aadamyia and Hay-Heteen.

Only, healthy children who do not show any systemic disease were considered. Those samples divided according to BMI into: underweight, healthy weight and overweight.

All children were examined while held by arms of their parent by knee to knee position. All information and oral examination were register on a case sheet. Oral examination was made to determine the number of erupted teeth. The children were examined visually using dental mirror under good light. The primary tooth considered erupted when the cusp tip or the incisal edge was emerged through the gingiva.

Weight of the children was measured in kilograms using a standard weighing scale, after removal of shoes.

Height was measured using a calibrated tape with the subject's back and knees completely straight and the feet together.

Body mass index [BMI] of each child was determined as the ratio of weight [in kg] to the square of height [in m]^[10].

$$BMI = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

3. Result

The results showed that the mean number of the deciduous teeth was higher in the children who are overweight than children who are with normal weight or underweight in all

age groups from 12 to 35 months and the mean number of the deciduous teeth was higher in the children who are with normal weight than those who are underweight in all groups of the children from age 12 month to 35 month with statically significant difference [$P > 0.05$] in group I [12-19 month] and by using Games-Howell post hoc test the results were found to be not significant difference except between the Underweight and overweight, the result was found to be highly significant difference [$p=0.009$] and highly

significant [$P = 0.00$] in age group III [28-35 month] and by using HochbergG2 post hoc test the result were found to be highly significant difference except between normal weight and overweight the result was found to be not significant [$p=0.959$]. While in age group II [20-27 month] statically not significant difference. In addition, the mean number of deciduous teeth is lower in children who are underweight in all age groups from [12-35] months, see Table [1].

Table 1: Mean number of the deciduous teeth in relation to the body mass index.

Group Age group [month]	Body mass index [kg/m ²]	NO.	Mean	±SD	Maximum	Minimum	F	Sig.	post hoc test
Group I 12-19	Underweight ¹	10	7.6	4.03	8	6	7.935	0.01*	2X1=0.373#
	Normal weight ²	12	10.33	4.033	14	4			1X3=0.009**
	Overweight ³	18	12.33	3.43	17	7			2X3=0.373#
Group II 20-27	Underweight	12	17.3	1.49	18	16	3.359	0.061#	-----
	Normal weight	16	18.75	.82	20	16			-----
	Overweight	10	19	1.00	20	18			-----
Group III 28-35	Underweight ¹	10	18.2	.86	19	18	9.282	0.001**	1X2=0.001**
	Normal weight ²	34	19.64	.45	20	17			1X3=0.001**
	Overweight ³	18	19.77	.44	20	19			2X3=0.959#

#=not significant at $P > 0.05$, *=significant at $P < 0.05$, **=highly significant at $P < 0.01$.

The mean number of the deciduous teeth in the girls was slightly more than boys in all age groups of children from

age 12 months to 35 months with statically not significant difference [$P > 0.05$], see Table [2].

Table 2: Mean number of the deciduous teeth in relation to the gender among children

Age of children [month]	Gender	Mean	±SD	Maximum	Minimum	T-test	Sig.
Group I 12-19	boys	10.33	4.23	16	4	-0.170	0.867 [NS]
	girls	10.64	3.52	17	6		
Group II 20-27	boys	18.2	1.32	20	6	-0.566	0.579 [NS]
	Girls	18.55	1.42	20	7		
Group III 28-35	Boys	19.29	0.99	20	17	-1.091	0.284 [NS]
	Girls	19.64	.74	20	18		

[NS]#=not significant at $P > 0.05$

4. Discussion

This study provides evidence of a positive association between deciduous teeth emergence and weight status in both gender. The mean number of deciduous teeth was higher in children who were overweight than those who were with normal weight, see table [1] this agrees with Khan et al.^[13] who found that accelerated dental development was seen in overweight children. These findings indicate that nutritional status has an effect on dental maturity^[14]. Research on children and dental development also showed a positive correlation concluding that overweight children mature earlier and teeth tend to erupt earlier as compared to children with normal body mass index^[15].

In this study the mean number of deciduous teeth was lower in children who were underweight than those who were with normal weight and overweight, see Table [1], this may be explained by that as early malnutrition in childhood affects skeletal growth and results in decreased height similarly, poor nutrition affects tooth eruption and results in delayed emergence of deciduous teeth^[16]. This disagrees with Hilgers et al.^[17] who observed that severe malnutrition appears to have a minimal effect on the timing of tooth formation this reflects the stability of the developing dentition in relation to

other biological systems which are thought to be affected by malnutrition.

Also, this study showed that the mean number of deciduous teeth in the girls was slightly higher than boys with no significant difference between them in all age groups of children aged from 12 months to 35 months, see Table [2]. Earlier eruption of teeth in girls is attributed to earlier onset of maturation^[18]. This agrees with Almonaitiene and Tutkuviene^[19] who showed that the mean number of the deciduous teeth in the girls was higher than boys in all groups of the children from age 6 months to 34 months.

From the results of this study mentioned above, it has been concluded that nutritional status affects the eruption of deciduous teeth in all age groups and the female dentition erupt earlier than the male dentition.

References

- [1] McDonald RE, Avery DR, Scheetz JP. Dentistry for the Child and Adolescent, 8th edition. Philadelphia: Elsevier, 2004: 177-8
- [2] Negar Sajjadian, H. Shajari, Ramin Jahadi, Michael G. Barakat, Ali Sajjadian. Relationship between Birth

- Weight and Time of First Deciduous Tooth Eruption in 143 Consecutively Born Infants. *PediatrNeonatal*,2010;51(4):235–237
- [3] Soliman NL, El-Zainy MA, Hassan RM, Aly RM. Relationship of deciduous teeth emergence with physical growth. *Indian J Dent Res*. 2012; 23(2):236–40.
- [4] Yared FN, Santos-Pinto A. Study of the relation between somatic growth and dental eruption according to age, sex and socioeconomic level. *RevOdontol UNESP*, 1996; 25: 195-209.
- [5] Garn s. m, A. B. Lewis and R. S. Kerewsky. Genetic, nutritional, and maturational correlates of dental development. *J.dental Res*, 2001; 44: 228.
- [6] Balilit, H. L., J. S. Friedlander, and B. Snug. Maternal effects on the developing dentition. *Arch. Oral Bio*.2002; 13: 155.
- [7] Bailey K. V. and Ferro-LuzziA. Use of body mass index of adults in assessing individual and community nutritional status. 2003; 38:271-284.
- [8] Boenjamin, Situmorang N, Nasution L. Malnutrition. *Dentika Dent J*, 2006; 1: 110.
- [9] Gaur R, Kumar P. Effect of undernutrition on deciduous tooth emergence among Rajput children of Shimla District of Himachal Pradesh, India. *Am J Phys Anthropol*, 2012; 148(1):54-61.
- [10] Khan MA, Khan D, Nawaz R. Prevalence pattern of dental caries in permanent teeth among school children of Peshawar city. *Kjmsjulydecember*, 2011; 3:253.
- [11] Centers for Disease Control and Prevention (CDC). BMI percentile calculator for child and teen English version. 2014.
- [12] World Health Organization: WHO Child Growth Standards: Length/Height-for-Age, Weight-for-Age, Weight-for-Length, Weight-for-Height. World Health Organization, 2006, p 332
- [13] Hilgers KK, Akridge M, Scheetz JP, Kinane DE. Childhood obesity and dental development. *Pediatr Dent*, 2006; 28:18- 22.
- [14] Bagherian A. and Sadeghi M. Assessment of dental maturity of children aged 3.5 to 13.5 years using the Demirjian method. *Journal of Oral Science*.2011; 53(1):37-42.
- [15] AlmonaitieneR, Balciuniene I, Tutkuviene J. Factors influencing teeth eruption. Part onegeneral factors. *Stomatologija*, 2010; 12:67-72
- [16] Arvystas MG. familial generalized delayed eruption of dentition with short stature. *Oral surg oral med oral phathol*, 2002; 05:235- 43.
- [17] Elamin F, Liversidge HM .Malnutrition Has No Effect on the Timing of Human Tooth Formation. 2013. *PLoS ONE* 8(8): e72274. doi:10.1371/journal.pone.0072274
- [18] Ekstrand KR, Christiansen J, Christiansen ME. Time and duration of eruption of first and second permanent molars. *Community Dent Oral Epidemiol*, 2003; 31: 344-50.
- [19] Aziz HK. Age estimation of first deciduous tooth and sequence of eruption of primary teeth in relation to the nursing habits among the kerbala children. *Journal of Kerbala University*, 2010; 8(3)