

# Caries increment in preschool children: A longitudinal study

Iman T. Ibrahim BDS, M.Sc. <sup>(1)</sup>

## ABSTRACT

**Background:** This study was concerned with the caries increment in preschool children after one-year follow up examination.

**Materials and Methods:** The sample consisted of 144 preschool children; the sample was examined at November 1997 and was reexamined at November 1998. The examination included clinical examination of the whole dentition as the dmft was recorded, also the height and weight of children was recorded to find the correlation between caries increment and nutritional status of children.

**Results:** The increment after one year period (1997 – 1998) in mean value of dmft for different groups which were divided according to their dmft to (0, 1, 2, 3, 4, >5) the increment ranged between (0.5-1.75) the highest increment was in the "2" mean dmft value, (2-3.75), it was demonstrated that there was a correlation ( $r = 1.00$ ,  $P < 0.001$ ) between the Body Mass Index (BMI) and Increment in dental caries specially in the undernourished group.

**Conclusion:** It was found that there was an increment equal to "0.89±0.25" in the mean value of dmft (20.31) % and a strong correlation between nutritional status expressed by Body Mass Index (BMI) and increment in dental caries.

**Key words:** Caries, preschool children, nutritional status (J Bagh Coll Dentistry 2006; 18(2)89 -91)

## INTRODUCTION

A caries risk group can be defined as a subgroup of the population whose members on the average have a higher risk of developing new carious lesions than have the members of the remaining population. Since risk cannot be assessed directly, measurable known correlates of caries increment, such as past caries experience, microbial counts etc., need to be used as screening criteria for identifying such a group <sup>(1)</sup>. The aim of different studies in the field of caries prediction were almost always oriented toward specifying the risk group and

Longitudinal studies which give good information about the correlation of different factors causing dental caries with caries increment. One of these factors is the general nutritional status which could be measured by height and weight, or other indicators.

It has been shown in previous studies that in groups of randomly selected children, the higher the frequency of meals, higher sugar consumption, and higher salivary counts lactobacilli and *S. mutans*, had higher caries increment <sup>(2)</sup>.

The objective of the present study was to find out the increment in mean value of dmft during one-year period in preschool children aged 4-5 years old, and so find the correlation between the body mass index (BMI) and caries increment.

## MATERIALS AND METHODS

The sample of the study consisted of 146 children 74 boys, 72 girls, who were examined randomly in different kindergartens in the first year of examination from November to the end of December 1997, and the same sample were reexamined except for 11 children who were missing during the period of November to the end of December 1998.

The clinical examinations were done under standard conditions using natural daylight, dental mirrors and dental probes.

It was decided to use the "Body Mass Index" (BMI), which is used to define nutritional status. It was derived from the formula, weight (Kg)/height (m) <sup>(2,3)</sup> where the weight was measured using a beam balance scale manufactured by "Hanson Ireland". The child was relieved from heavy clothing, shoes were removed before examination; the child was asked to stand on the scale, and it was checked again. The reading were in Kilograms, the height was measured without shoes or socks, the child stands straight with the heels together, feet parallel to each other and pointing to each other and pointing forward, the knees were straight. After clinical examinations had been made, the results of these two examination were analyzed using t-test, and correlation's coefficient.

## RESULTS

It is shown in Table 1 that the number of male and female children was almost equal.

---

(1) Assistant professor, Department of Pedodontic and Preventive Dentistry, College of Dentistry, University of Baghdad

The differences between the two genders in 1997 and 1998 was not significant; but in the total sample the difference in the mean dmft value was significant at ( $P < 0.001$ )

In Table 2, the increment in carious lesions in the total sample was demonstrated in the number of carious lesions, and the mean value of dmft. It was found that there was an increment equal to  $0.89 \pm 0.25$  in the mean value of dmft, 20.31 % increment during the year period.

In Figure 1, the increment after one year period (1997 – 1998) in mean value of dmft for different groups which were divided according to their dmft to (0, 1, 2, 3, 4, >5), the highest increment was in the “2” mean dmft value, (2-3.75). It was clear from this figure that there was increment in all the groups.

In Figure 2, it was demonstrated that there was a correlation ( $r = 1.00$ ,  $P < 0.001$ ) between the Body Mass Index (BMI) and increment in dental caries specially in the undernourished group 12-13, as dmft of this group was  $4.00 \pm 0.81$  increase to  $8.00 \pm 7.00$ , a significant difference was demonstrated in these groups compared to other groups.

## DISCUSSION

This study showed that after one-year period there were about 54 new lesions, which mean 18.5%, increment and the mean dmft increased from  $4.39 \pm 3.7$  to  $5.28 \pm 3.96$  with difference  $0.89 \pm 0.25$ , which means almost one carious lesion increment.

In Iceland (1993) a study undergone on 158 preschool children for 2 years period, the mean dmft increased from 3.3 to 5.8. The caries free children (34%) remained caries free throughout the study<sup>(4)</sup>. In another longitudinal study in the United States on 184 preschool children aged 3-5 years, it was found that caries increased significantly from dmft 2.5 to 5.5 ( $P < 0.001$ ) in 1 year which was in

agreement to the present study<sup>(5)</sup>. This yearly increment is less than what was found in older groups as for example 16-18 years the yearly increment in 9-17% of the youngsters equal to 3D/T<sup>(6)</sup>.

Concerning the relationship between nutritional status and the caries increment an investigation reported in county Durham (Britain 1995)<sup>(7)</sup> an index of material deprivation was used, to indicate groups of young children at risk to dental caries. It was in agreement to the results of this study. In an Iraqi study on preschool children in Baghdad 1995<sup>(8)</sup>, it was found that caries prevalence in malnourished children was higher than of well nourished children and the indicator of malnutrition used was cutoff point – ISD for weight/Age, Height/Age .

## REFERENCES

- 1- Thylstrup A, Fejerskov O. Text Book of clinical cariology. 2nd ed : by Munksgaard ; 1996; 393-6
- 2- Steckslen-Blicks C, Gustafsson L. Impact of oral hygiene and use of fluorides on caries increment in children during one year. Community Dent and Oral Epidemiol 1986; 14: 1859.
- 3- MacLeod J, Edwards C, Bouchier I. Davidson's Principles and Practice of Medicine. 15th ed. By: Churchill Livingstone, 1987; 526.
- 4- Halbrook WP. Dental caries and cariogenic factors in preschool urban Icelandic children. Caries Res 1993; 27(5): 431-7.
- 5- ReiSine S, Litt M., Tinanoff N. Abiopsychosocial model to predict caries in preschool children. Pediatric Dent 1994; 16(6): 413-8.
- 6- Kosa W. Caries prevalence, caries experience, caries increment and caries risk in apprentices of (6-18y). Dtsch-Stomatol (English Abstract) 1991;41(5): 179-80.
- 7- Provart ST, Carmichael CL. The use of an index of material deprivation to identify groups of children at risk to dental caries in county Durham. Community Dent Health 1995; 12 (3): 138-42.
- 8- AL-Obadi W, AL-Caesy M. Oral health status in relation to nutritional status among kindergarten children in Baghdad – IRAQ. (Thesis) Submitted to the College of Dentistry University of Baghdad 1995.

**Table 1: Distribution of the sample by gender, means and SD of (dmft) at first of examination (1997), and 2nd year of examination (1998)**

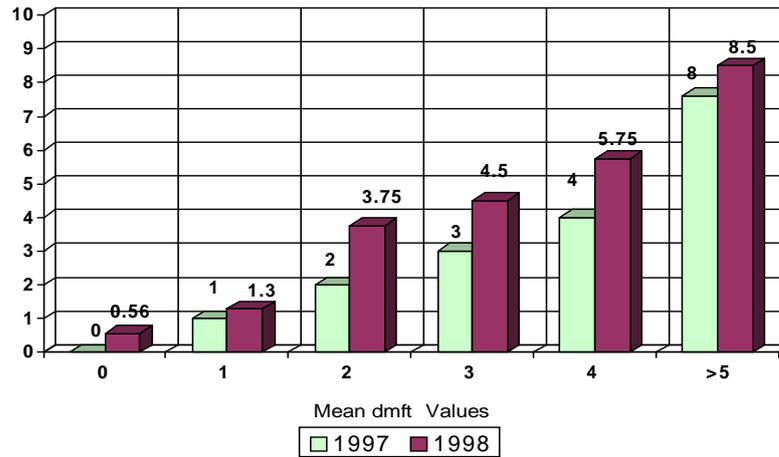
	1997	1998	Difference %	
Total No. of Carious lesions	307	364	54	18.5%
Mean dmft value	$4.39 \pm 3.71$	$5.28 \pm 3.96^{**}$	$0.89 \pm 0.25$	20.31%

\*\*significant at  $P=0.001$

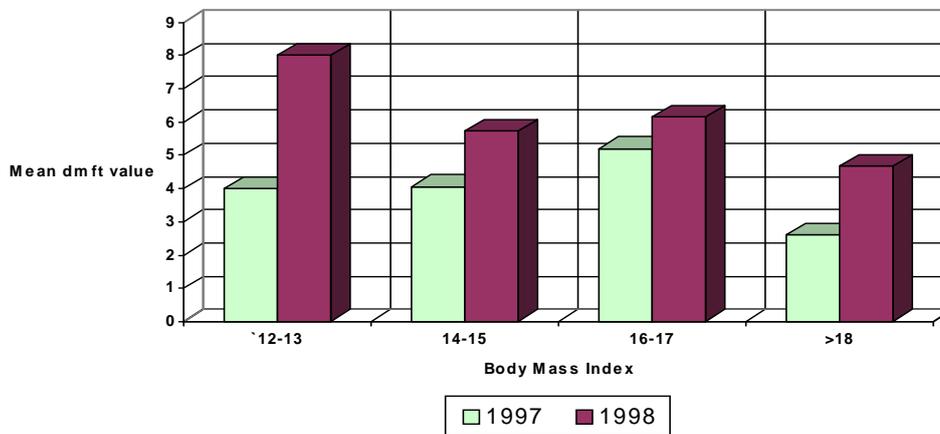
**Table 2: Caries increment during one year period 1997-1998**

	1997			1998			Significance
	No. of children	%	Mean dmft SD	No. of children	%	Mean dmft SD	
<b>Male</b>	74	50.6	3.92±3.27	72	53.3	4.91±3.85	t=1.12 P=0.27 N.S
<b>Female</b>	72	49.3	4.86±4.01	63	46.6	5.73±3.92	t=0.91 P=.37 N.S
<b>Total</b>	146		4.39±3.71	135		5.28±3.96	t=-4.88** P=0.00

\*\*significant at P<0.001



**Figure (1) : Increment In Groups Arranged According To Their Mean dmft Value After One Year Period.**



**Figure (2) : Relation Between Body Mass Index And The Increment In Dental Caries dmft Mean Value In One Year Period.**