PREVALENCE OF CARIES IN RURAL AREA CHILDREN

C S Saimbi,* Kaushal S,** M A Khan,*** Avadhesh Kumar

A total of 657 school going children consisting of 397 boys and 260 girls in the age group ranging from 3-12 years were surveyed from rural areas of Lucknow, to determine the prevalence of dental caries and observe the effect of various oral cleaning habits.

The present study showed 60.4% prevalence of caries in rural area children. Girls were found to have greater caries (68.1%) than boys (55.4%). The caries rate was fairly high (63.9%) in the mixed dentition period as compared to the deciduous dentition period (49.0%). The difference was highly significant ($p<0.001$).

The caries rate was highest (67.0%) in those children who were not cleaning their teeth followed by finger users (63.2%) and Datun users (58.1%).Brush users showed the lowest caries rate (42.2%) as compared to non-brush users (61.8%), the difference being significant ($p<0.01$)

Keywords: Caries, Tooth cleaning aids, Prevalence.

INTRODUCTION

Number of epidemiological studies on dental caries has been carried out all over the world[1-12] and these studies revealed greater variation in the prevalence of caries in different countries and even in different parts of the same country. The variation has been contributed to several factors such as socio-economic status, dietary and oral cleansing habits etc. Very limited studies have been conducted on the rural population in India.[10]

The rural masses usually use indigenous oral cleaning aids such as Ayurvedic or home made tooth powder, charcoal and greenstick of Neem or Babul etc. for cleaning their teeth. Therefore, this study was conducted with the aim to find out the prevalence of dental caries, and to observe the effect of various oral cleaning habits on the prevalence of caries in the rural area children around Lucknow district, India. The present study was conducted in deciduous and mixed dentitions, so that appropriate preventive measures, if required, can be instituted in the early age of life.

*Professor
**Asst Professor
***Professor
****Senior Lecturer, Department of Periodontics, C.P.G.I.D.S. & Hosp., Ghaila, Lucknow, India

MATERIAL AND METHODS

The survery was conducted on 657 school-going children consisting of 397 boys and 260 girls in the age group ranging from 3-12 years. The children were selected randomly from the rural areas of Lucknow. The detailed dental examinations were recorded on the specifically designed proforma, recommended by the WHO[13]. Each individual was interviewed for the type of material used for cleaning of their teeth. The data so obtained was divided into four groups according to age, i.e. 3-6, 7-8, 9-10 and 11-12 years and analyzed on the basis of various oral cleaning habits.

STATISTICAL METHOD

For the purpose of statistical analysis, Pearson's chi-square test has been used. The confidence of the study has been kept at 95%, hence $p<0.05$ has been considered as significant.

RESULTS

Dental caries was observed in 397 children out of 657 children (60.4%). Female children were found to have greater prevalence (68.1%) compared to male children (55.4%) (Table-1). According to age wise distribution of the diseases, maximum caries was observed in 7-8 years age group (69.7%) followed by the age group of 9-10 years (62.5%)

(Table-1). The caries rate was observed maximum for both male (65.8%) and female children (78.0%) in the age group of 7-8 years.

According to dentition wise distribution of the disease, deciduous dentition period showed less caries rate both in male (45.9%) and female (54.4%) groups. Caries rate was significantly higher (63.9%) in the mixed dentition period (7-12 years) as compared to deciduous dentition (49.0%) and the difference was statistically significant at the level of $p<0.001$ (Table-2).

Table 1: Prevalence of caries according to age and sex

Age group	Male			Female			Total		
	No. of Subjects	Caries		No. of Subjects	Caries		No. of Subjects	Caries	
		No.	%		No.	%		No.	%
3-6	98	45	45.9	57	31	54.4	155	76	49.0
7-8	73	46	63.0	59	46	78.0	132	92	69.7
9-10	125	71	56.8	59	44	74.6	184	115	62.5
11-12	101	58	57.4	85	56	65.9	186	114	61.3
Total	**397**	**220**	**55.4**	**260**	**177**	**68.1**	**657**	**397**	**60.4**

Table 2: Prevalence of caries in deciduous and mixed dentition periods

Dentition period	Male			Female			Total		
	No. of Subjects	Caries		No. of Subjects	Caries		No. of Subjects	Caries	
		No.	%		No.	%		No.	%
Deciduous (3-6 years)	98	45	45.9	57	31	54.4	155	76	49.0
Mixed (7-12 years)	299	175	58.5*	203	146	71.9**	502	321	63.9
Total	**397**	**220**	**55.4**	**260**	**177**	**68.1**	**657**	**397**	**60.4**

Test of significance:

Value of x^2 (D.F) 4.75* 6.30** 11.01**

* = $p<0.05$

* = $p<0.001$

Significance of difference from deciduous

Effect of various cleaning aids in relation to dental caries is presented in Table-3. Out of 657 children 253 used Datun, 250 used finger and 45 used brush, while there were 109 children who do not use anything for the cleaning of their teeth. Among all the children a highest rate of dental caries was observed in children using nothing for cleaning their teeth (67.0%) followed by the finger users (63.2%), datum users (58.1%) and brush users (42.2%).

Datun user's male children showed only 42.9%, while female showed 80.0% of caries rate in the age group of 3-6 years. Among datum user children, the caries prevalence (57.6%) was observed in 7-8 years, followed by a slight increase (63.2%) in 9-10 years age group. Subsequently, a decrease in caries rate (54.3%) was observed in the 11-12 years.

Among finger cleansers the caries rate in all the age groups ranged between 69.4 to 71.4%, except 3-6 years age group in which caries rate was only 45.7%. There was no marked sex difference. When the difference in caries prevalence between brush and non-brush user was statistically analyzed, a significant difference ($p<0.01$) was observed (Table-4).

Table 2: Prevalence of caries in deciduous and mixed dentition periods

Cleaning Aids	Age group (in yrs)	Male			Female			Total		
		No. of Subjects	Caries		No. of Subjects	Caries		No. of Subjects	Caries	
			No.	%		No.	%		No.	%
Datum	3-6	14	6	42.9	10	8	80.0	24	14	58.3
	7-8	41	23	56.1	18	11	61.1	59	34	57.6
	9-10	57	34	59.6	19	14	73.7	76	48	63.2
	11-12	49	22	44.9	45	29	64.4	94	51	54.3
Total		161	85	52.8	92	62	67.4	253	147	58.1
Finger	3-6	44	20	45.5	26	12	46.2	70	32	45.7
	7-8	28	18	64.3	14	12	85.7	42	30	71.4
	9-10	44	25	56.8	28	25	89.3	72	50	69.4
	11-12	33	25	75.8	33	21	63.6	66	46	69.7
Total		149	88	59.1	101	70	69.3	250	158	63.2
Brush	3-6	13	4	30.8	8	3	37.5	21	7	33.3
	7-8	0			7	4	57.1	7	4	57.1
	9-10	7	4	57.1	6	2	33.3	13	6	46.2
	11-12	4	2	50.0	0			4	2	50.0
Total		24	10	41.7	21	9	42.9	45	19	42.2
None	3-6	27	14	51.9	13	10	76.9	40	24	60.0
	7-8	4	3	75.0	20	18	90.0	24	21	87.5
	9-10	17	11	64.7	6	4	66.7	23	15	65.2
	11-12	15	9	60.0	7	4	57.1	22	13	59.1
Total		63	37	58.7	46	36	78.3	109	73	67.0

DISCUSSION

Epidemiological studies from all over the world show that dental caries is the most widely distributed disease and requires major attention in public health programmes. The severity, however, varies widely in various population groups. Mostly the studies on caries prevalence have so far been confined to the urban population[3,7,8] and on the other hand very few studies[10-12] observed the caries rate amongst village population. This may be probably because of lack of cooperation from rural masses. Same problem encountered in this study also. The present study was aimed with a bigger sample but it could not be achieved because of poor attendance in rural schools. The same situation has also been observed in the study of Gill and Prasad (1968)[11].

PREVALENCE OF CARIES

The present study showed that the rural population of the Lucknow has 60.4% caries prevalence. However Malviya et al.[12] found 50.77% caries prevalence among 516 school children surveyed in the Sarojini Nagar area, Lucknow. It has been observed that caries incidence in India is less as compared to the Western countries. Maxy and Rosenau (1964)[14] concluded that in U.S.A., 75 to 90 percent children entering school had already experienced caries and according to W.H.O.[13] 70 to 90 percent European children suffered from caries. On the other hand, isolated surveys on dental caries in India, revealed that the prevalence rate ranged from 46.2 (Madras[15]) to 71.8 (Bombay[7]). In Amritsar[16], Bombay[7], Gujrat[17], Calcutta[18] and Orisa[9], the caries prevalence was observed as 51.5, 71.8, 69.0, 48.2 and 60.4 per cent, respectively. It is evident from the foregoing that caries prevalence is higher in the more civilized population groups than in the areas approaching to the civilization.

In the present study, caries prevalence was observed low (49.0%) in primary dentition period as compared to mixed dentition groups (63.9%) (Table-2). In the early mixed dentition period the caries rate was highest (69.7%), after that a continuous decline in the rate was observed up to the end of mixed dentition period (61.3%) (Table-1). Similar pattern in the rate of caries was also observed by Mishra and Shee[9] in the Orissian children. It may be explained by the fact that the caries rate increases in early mixed dentition period due to longer exposure of deciduous teeth in the oral cavity. In the late mixed dentition period, the caries rate is declined due to shedding of deciduous teeth. The other reason for fall in the caries rate may be due to increase awareness about the cleaning of teeth with the advancing age in the children. Higher caries rate in female was observed as compared to the male in the present study, which is very well in accordance with the finding of Mishra and Shee[9].

Table 4: Statistical evaluation of difference in proportion of caries between brush and non users.

Cleaning aids		No. of subjects examined	Caries		Value of x^2 (Test of significance)
			No.	%	
A. Brush users		45	19	42.2	6.69*
B. Non Brush users		612	378	61.8	
	Datum	253	147	58.1	2.906
	Finger	250	158	63.2	
	None	109	73	67	
Total		**657**	**397**	**60.4**	

*p<0.01

EFFECT OF CLEANING AIDS

Most of the children used Datun (253) and finger (250) with the indigenous powders, charcoal, soil and sand for cleaning their teeth in the rural areas around Lucknow. There were very few children who used brush (45) and about 15% children do not clean their teeth. The present study revealed that caries rate was very less in the brush users (42.2%) as compared to non-brush users (61.8%) (Table-4). Similar observations have also been observed by Mishra and Shee[9] and Kapoor *et al.*[19]. Among the non-brush users, highest caries rate was observed in those children who do not clean their teeth (67.0%) followed by finger user (63.2%) and Datun users (58.1%).

This can be explained by the fact that the brush users were usually of higher socio-economic status having better hygienic sense than the non-brush users. It may be assumed that the Datun users may not be cleaning their teeth effectively as compared to brush users. Higher incidence of caries in finger users may be because of lack of cleaning of inaccessible areas, as finger removes the plaque only from the buccal and lingual surfaces and the movements of finger pushes the food debris into the interproximal spaces, which can be caries initiating factor at the interproximal sides.

It can be concluded form the above discussion that brush is the only cleansing aid which can reduce caries because of its better cleansing efficiency. As per socio-economic status of the rural population, brush has not been found as a choice for cleansing the teeth because of non-availability and an expensive item to them. Therefore, Datun may be considered as a better choice for the rural population because of its easy availability and antiplaque activity.

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