

DENTAL CARIES AND PERIODONTAL DISEASES AMONG URBAN, RURAL AND TRIBAL SCHOOL CHILDREN

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ABSTRACT

The oral health status in school children of Wardha was studied to find out the geographical differences in oral health status and to relate it with the teeth cleaning habit and nutritional status. A cluster sample of 778 children studying in 2 urban, 4 rural and 2 tribal primary schools was selected.

Majority (60.8%) of children were habituated to clean their teeth with Manjan. The prevalence of periodontal diseases was significantly high in children habituated to ash, Manjan and coal. The tribal children showed a better oral health status than urban counterparts. Nutritional status has played no role in dental decay.

The school oral health education campaigns should be addressed to dental caries, periodontal diseases and the harmful teeth cleaning materials.

Key words: Oral health, DM index, Periodontal diseases, Dental caries.

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There is enough evidence to show that the prevalence of orodental diseases is gradually increasing(1-6). Various studies carried out show a relationship between dental cleaning behavior and the occurrence of orodental diseases(7,8). It is important to study the factors associated with dental caries and periodontal diseases, so that the elimination or modification of these factors would enhance the teeth longevity. The modification of harmful teeth cleaning behavior, observed in the early childhood, can also lead to improved oral health.

We report the oral health status in primary school children in Wardha district with special reference to dental caries and periodontal diseases. We also studied the association between the oral health in relation to sex, location of school, brushing behavior, and nutritional status of the students.

Material and Methods

Kasturba Rural Health Training Centre, situated 17 km away from Wardha, is a satellite field unit of M.G. Institute of Medical Sciences. It is engaged in training the medical graduates and interns in primary health care. It was established under the Reorientation in Medical Education scheme and is aimed at supporting the primary health centre, Anji in providing quality services in the catchment area. The annual medical check-up of the primary school children is the responsibility of the PHC medical officer. During 1990-91, all the primary schools situated in the area covered by Anji PHC were stratified according to the locality as urban, rural and tribal schools. Two urban, 12 rural and 2 tribal primary schools are situated in the catchment area. All the urban and tribal schools and 4 randomly selected rural

schools forming a stratified cluster sample of the children were studied. In each school, all the children regularly attending the school were examined in 2-3 visits. The study sample consists of 2 urban, 2 rural and 1 tribal co-education schools and 2 rural and 1 tribal schools exclusively for girls.

A thorough health checkup was carried out by well-trained group of workers consisting of a social worker, interns, a registrar and a lecturer. The team members had basic training in diagnosis of orodental diseases following a 2-week posting in the Department of Dentistry at M.G. Institute of Medical Sciences. Ten per cent of the diseased children were independently examined by the dental surgeon as a cross check and the disease diagnosis was well correlated.

The oral health examination was carried out in day light with the help of periodontal probes, caries explorers, and plain mouth mirrors. The findings were recorded and followed the WHO guidelines required for oral health survey(9). The age of the pupil was ascertained with the help of the school admission register. An enquiry was made to find out the brushing behavior of children. The material used was classified as follows:

- (i) Manjan—locally available red and black granular powder.
- (ii) Nus (tobacco powder)—a fine powder of tobacco.
- (iii) Coal—home made burnt coal grinded in coarse form.
- (iv) Dantum—a small twig of babul (*Acacia nilotica* sub sp *indica*) or neem (*Azadirachta indica*)
- (v) Paste—any semi-solid substance available in the form of tube and manufactured by various companies, which was

being applied with the help of tooth-brush.

The nutritional status was classified as per the Gomez classification (weight for age and as per the 50 percentile of NCHS standards)(10). As there were no filled teeth observed in the school children, DM index (decayed and missing permanent teeth) was used in this study. DM index is calculated as the total number of decayed and missing teeth in each group divided by the total number of children in that group. The disease definitions used in the study were as follows:

Dental carries [Mollers index(11)]: Slight to definite discontinuation in the enamel with definite sticking of the probe in pits and fissure with or without discoloration. The probe requires a definite pull for its removal.

Periodontal diseases: A group of diseases affecting the surface or gingiva and penetrating the deeper structures. These are classified as (a) healthy, (b) bleeding, (c) calculus, and (d) abscess.

Stains: Any discoloration of teeth surface usually brown/brownish black due to the deposition of teeth cleaning material.

The data was analysed with the surface (EPI INFO VERSION 5) package.

Results

We screened 778 children, of which 316 (40.6%) were boys and 462 (59.4%) were girls. Of these, 123 children belong to urban, 375 to rural and 280 children to tribal primary schools. Table I depicts the age distribution of children from various schools. As shown in Table II, majority of the boys and girls (59.2 and 62.0%, respectively) were habituated to clean their teeth once every day with Manjan. Tooth paste

TABLE I—Distribution of School Children According to Age

Age (yrs)	Urban (n=123)	Rural (n=375)	Tribal (n=280)	Total (n=778)
5	15 (12.2)	30 (8.0)	16 (5.7)	61 (7.8)
6	29 (23.6)	35 (9.3)	12 (4.3)	76 (9.8)
7	40 (32.5)	20 (5.3)	12 (4.3)	72 (9.3)
8	18 (14.6)	51 (13.6)	8 (2.9)	77 (9.9)
9	16 (13.0)	45 (12.0)	20 (7.2)	81 (10.4)
10	5 (4.1)	43 (11.5)	24 (8.6)	72 (9.3)
11	-	33 (8.8)	30 (10.7)	63 (8.1)
12	-	38 (10.1)	19 (6.8)	57 (7.3)
13	-	29 (7.7)	29 (10.4)	58 (7.5)
14	-	51 (13.6)	110 (29.3)	161 (20.7)

Figures in parentheses indicate percentages.

TABLE II—Oral Morbidity and Use of Cleaning Material

Cleaning material	Number of children	Caries	Periodontal diseases		
			Bleeding/Abscess	Calculus	Stains
Coal	62	11 (17.7)	1 (1.6)	11 (17.7)	16 (25.8)
Ash	102	16 (15.6)	14 (13.7)	26 (25.5)	23 (22.5)
Manjan	473	71 (15.0)	15 (3.2)	48 (10.1)	123 (26.0)
Paste	81	12 (14.8)	6 (7.4)	6 (7.4)	10 (12.3)
Nus	5	2 (40.0)	0	2 (40.0)	3 (60.0)
Dantum	31	12 (38.7)	2 (6.5)	3 (9.6)	7 (22.5)
None	24	4 (16.0)	0	5 (20.8)	9 (37.5)
	778	128 (16.5)	38 (4.8)	101 (13.0)	191 (24.5)

Figures in parentheses are percentages taken from horizontal total.

χ^2 -test, $p < 0.005$.

and brush were used by 10.4% of children (5.7% of boys, 13.6% of girls). Twenty four children (3.1%) were not habituated to any material to clean their teeth, and were using finger and plain water to clean their teeth. Commercially available tobacco

tooth power was used by 5 children. Coarse materials like ash and coal which may damage gums and teeth enamel were used by 164 (21.1%) children. Usage of dantum was common among girls.

Dental caries was found in 128 (16.5%)

children followed by calculus in 101 (13.0%) children. The less pathognomonic morbid stains were present in 191 (24.5%) children. Around 40.0% of children habituated to nus and dantum were suffering from dental caries. However, the prevalence of caries among children habituated to coal, ash, Manjan and paste varied between 15-18%. The difference of dental caries among children using the former was significantly greater than those using the latter ($p < 0.005$). No particular trend was observed in DM index among boys and girls at various ages. The DM index at 12 years was 0.52 for boys and 0.80 for girls.

Periodontal abscess/bleeding was significantly high among children habituated to ash, coal and Manjan. Calculus was observed among children habituated to ash, coal and Manjan. Stains were observed among 26.0% Manjan users and 25.8% of coal users. The overall prevalence of periodontal diseases (abscess/bleeding and calculus) was 17.8% (139 of 778) and was observed mainly among children using ash, coal and Manjan.

The oral health status showed high prevalence of dental caries (22.8%) among urban children (Table III). Eighty five rural children (22.6%) were suffering from peri-

odontal diseases, in contrast to 13 (10.5%) from urban and 41 (15.0%) from tribal schools. These differences were statistically significant ($p < 0.05$). Thirty per cent of tribal children showed staining of their teeth.

The relationship between nutritional status and dental carries when analysed showed equal distribution of diseased children among various grades of malnutrition.

Discussion

We noticed that older children (>12 yrs) are common in rural and tribal schools. This might be due to the late enrolment observed in these regions. Of 778 primary school children screened, 473 (60.8%) were habituated to Manjan to clean their teeth. Earlier this harmful habit was reported in high proportion among children from Maharashtra and Karnataka (4,12). However, in Uttar Pradesh only 12.5% of rural school children were habituated to tooth powder and ash(13). The granular materials (Manjan, ash, and coal) produce irreversible enamel damage and make the tooth susceptible for decay(14). The soft gum tissue is also affected by these coarse materials.

TABLE III—Oral Health Status Among School Children

Condition	Urban (n=123)	Rural (n=375)	Tribal (n=250)
Dental caries	28 (22.8)	58 (15.5)	42 (15.0)
Periodontal bleeding	1 (0.8)	27 (7.2)	7 (2.5)
Periodontal abscess	1 (0.8)	2 (0.5)	-
Calculus	11 (9.0)	56 (15.0)	34 (12.5)
Stains	23 (18.7)	84 (22.4)	84 (30.0)

Figures in parentheses indicate percentages.

χ^2 test, $p < 0.05$.

Earlier studies on prevalence of oral morbidity were mainly focussed on dental caries, and showed that more than 80% of oral morbidity in school children was due to dental caries(7,15-17). This study shows that though dental caries is the major morbidity (16.5%), other tooth and gum damaging conditions including periodontal abscess and bleeding (4.8%) and dental calculus (13.0%) were also prevalent.

Few studies have indicated a relationship between brushing behavior and oral health status(7,8). In this study, it was found that periodontal diseases were prevalent among children who clean their teeth with ash, coal and Manjan. However, dental caries showed no such association.

The dental decay was prominent among urban children (22.8%). Though tribal children are considered to be partially immune to dental caries(6,18), we observed that the prevalence of tooth decay was similar to that of rural children. But unlike Talim(5) who found equal proportions of periodontal diseases among rural and urban children, the present study showed that the susceptibility was higher in rural children. The relationship of nutritional status and dental caries is controversial(3,19). However, this study showed that there is no association between dental caries and the grade of malnutrition ($p > 0.05$).

Our observations indicate that dental caries and periodontal diseases are prevalent among primary school children. Periodontal diseases are prevalent among rural children who are using coarse harmful teeth cleaning material. Dental decay is less prevalent among rural and tribal children than urban children. We found no association between nutritional status and dental caries.

The observed teeth cleaning behavior in children needs urgent attention as sub-

stances like coarse granular materials and addiction prone tobacco powders would cause irreversible damage in later life.

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NOTES AND NEWS

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