

Oral Health Status of 6- And 12-Years Old School-Going Children in Rural Barabanki, India: An Epidemiological Study

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Citation of this Article: Vertika Gupta, Nalini Tripathi, Perna Vishwanath, Bushra Saz, “Oral Health Status of 6- And 12-Years Old School-Going Children in Rural Barabanki, India: An Epidemiological Study”, IJDSIR- July - 2020, Vol. – 3, Issue -4, P. No. 529 – 534.

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Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background and Aim: Oral health is important for the overall healthy wellbeing of an individual. It is an important element of general health throughout life. However oral health negligence had been seen often in India especially among children of rural areas. Millions of children suffer from various oral health issues such as dental caries, periodontal diseases; malocclusion etc. There is a paucity of literature on oral health status in rural Barabanki among children of 6 and 12 years old thus demanding a need for epidemiological studies that could assist in the implementation of oral health promotion programs. Therefore the aim of the study was to assess the oral health status of 6- and 12-year old school-going children in rural Barabanki, India.

Materials And Methods: The cross-sectional study was conducted in three schools of rural Barabanki, India

among 1200 subjects of 6 and 12 years old school-going children. A total of 510 in the age group 6 years and 690 in the age group 12 years of both sexes were examined by two examiners. Prevalence of dental caries was recorded using dentition and treatment needs index, the prevalence of dental calculus was assessed using Code 2 of CPITN and prevalence of malocclusion was recorded using WHO criteria. The data was recorded and analyzed using Chi-square test to calculate the difference among age groups for the above mentioned oral diseases.

Results: The results of the present study showed that a significant difference was observed between the two groups with respect to the prevalence of caries, calculus and malocclusion ($p < 0.05$) and significant difference was seen between the age groups 6- and 12 years with respect to overall oral health status for dental diseases ($p < 0.05$).

Conclusion: The study concludes that there is a need for preventive strategies and effective program implementation on oral health and this data could serve as a baseline for reducing the burden of oral diseases in rural areas of Barabanki.

Keywords: Barabanki, Calculus, Dental caries, Malocclusion, Oral health, Prevalence, Rural

Introduction

Oral health is a crucial factor of the overall fitness of an individual. Oral well being is important for the growth and development both physically and emotionally. Millions of individual suffer from disease of oral origin such as dental caries, periodontal disease which further causes pain, difficulty in eating, swallowing and an increase in expenses due to the costs in its treatment ^[1].

Untreated dental diseases of children are frequently seen leading to pain, loss in general health which in turn affects the growth and loss of school time ^[2]. The most common oral health problem is dental caries in children and had shown an increase in trends ^[3].

Second most common disease is the periodontal problem which has been accepted as the most widespread disease after caries in children which appear due to plaque and calculus ^[4].

Thirdly malocclusion is another oral health problem in children which hampers the growth of oro-facial structures, periodontal problems, deleterious oral habits etc ^[5, 6].

Oral health had always been a neglected part of the general health since a long time all over the world especially in developing countries like India. In India majority of the population resides in rural parts where there is a lack of low socioeconomic status, poor education, and awareness on oral health and limitation of proper medical facilities.

At present there is a lack of literature on oral health status in rural parts of Barabanki district, India among 6 and 12 years old school going children. The epidemiological data collected can help in designing the oral health professionals in proper planning and implementation of the treatment needs of the population in terms of preventive programs execution. Therefore the purpose of this study was to assess the oral health status of 6 and 12 years old school going children of rural Barabanki.

Material And Methods

The cross-sectional study was conducted in three schools of rural parts of Barabanki District, Uttar Pradesh. The children of age 6 years and 12 years were examined from three different schools. The total student examined were 1200 out of which 510 were in the age group 6 years and 690 in the age group 12 years. The selection of schools was done using computer-generated list, visit dates were predetermined and only students present on that day were examined. Permission from school authorities was taken on paper and informed consent was obtained from the parents before planning the survey.

The inclusion criterion was children of 6 years and 12 years of age and children who were physically and mentally challenged were excluded from our study.

Examination was done on a normal chair with the help of diagnostic mouth mirror and periodontal probe (CPI probe) in natural light. Pre-sterilized set of diagnostic instruments were carried by the examiner. Children were examined by two examiners. The procedure used for recording was standardized and calibrated between the examiners. The tooth surface was cleaned with the help of tweezers and cotton if any debris was found. Sterilization of instruments was done at the end of the day after single use. Simple oral health survey form (WHO form 1997) was used to record the data ^[7]. Information about age and sex were documented.

CPITN Code 2 was used to determine the presence of calculus [1]. Assessment of Dental caries was done by Dentition status and Treatment needs (WHO 1997) [7]. Malocclusion was recorded using WHO criteria. After the examination, all students were informed about their individual oral health status and the treatment required. A short power-point presentation was also present to these children to increase awareness of oral health prevention.

The data collected was entered into SPSS software 20.0 (Chicago, USA). Frequency tables were constructed and data was statistically analyzed using Chi square test. The data was considered significant at $p < 0.05$.

Results

In the present study **Table 1** shows that 1200 school going children were examined out of which 510 were in the age group 6-years and 690 in the age group 12 years belonging to both the sexes. In 6 years old age group, 248 (48.65%) were males and 262 (51.3%) were females and in 12 years old school going children 315 (45.6%) males and 375

Gender	Male		Female		Total
	n	%	n	%	
Age (Years)					
6	248	48.6	262	51.3	510
12	315	45.6	375	54.3	690
Total	563	46.9	637	53	1200

(54.3%) females were examined.

Table 1: Distribution of subjects according to age and gender.

Table 2 shows the prevalence and percentage of caries distribution among 6- years and 12 years old school-going children. In 6 year age group, the overall prevalence of caries was 59.3% with 36.2% in males and 63.7% in females. In 12 year age group the overall prevalence of caries was 40.6% with 22.8% and 77.1% in males and females respectively. There was a significant difference in

the prevalence of caries between the two age groups ($p < 0.05$).

Age (Years)	Male (Subject %)	Female Subject (%)	Total Subject %)	Chi square	p value
6	74(36.2)	130(63.7)	204(59.3)	6.39	0.011
12	32(22.8)	108(77.1)	140(40.6)		
Total	106	238	344		

Table 2: Prevalence of Dental Caries

Table 3 shows the prevalence of malocclusion among the study population. In 6 year age group, the overall prevalence of malocclusion was 36.3% with 30% in males and 70% in females. In 12 year age group the overall prevalence of malocclusion was 63.6% with 40% and 60% in males and females respectively. There was a significant difference in the prevalence of malocclusion between the two age groups ($p < 0.05$).

Age (Years)	Male (Subject %)	Female (Subject %)	Total (Subject %)	Chi square	p value
6	60(30)	140(70)	200(36.3)	5.07	0.024
12	140(40)	210(60)	350(63.6)		
Total	200	350	550		

Table 3: Prevalence of Malocclusion

Table 4 shows the prevalence of calculus distribution among 6- years and 12 years old school-going children. In 6 year age group, the overall prevalence of calculus was 46.3% with 63.1% in males and 36.8% in females. In 12 year age group the overall prevalence of calculus was 53.6% with 40.9% and 59% in males and females respectively. There was a significant difference in the prevalence of calculus between the two age groups ($p < 0.05$).

Age (Years)	Male (Subject %)	Female (Subject %)	Total (Subject %)	Chi square	p value
6	60(63.1)	35(36.8)	95(46.3)	9.22	0.002
12	45(40.9)	65(59)	110(53.6)		
Total	105	100	205		

Table 4: Prevalence of Calculus

Table 5 depicts the overall prevalence of dental diseases among the age groups. The difference was found to be significant between 6- and 12 year old age groups for the overall prevalence of dental diseases ($p < 0.05$).

Disease	6 Year (Subject %)	12 Year (Subject %)	Chi square	p value
Dental Caries	204(59.3)	140(40.6)	45.65	0.00001
Calculus	95(48.4)	100(51.2)		
Malocclusion	200(36.3)	350(63.6)		
Total	499(45.8)	590(54.1)		

Table 5: Prevalence of Dental diseases among the two age groups

Discussion

In the present study 5-6 years and 12 years old as age groups were selected as these ages are the global monitoring age given by WHO for dental caries and for monitoring of disease trends. [8] In our study caries incidence was seen high in 6 years old school going children i.e. 59.3% and a decrease in caries experience was seen 12 years old age group (40.6%). These findings are similar to the finding reported by several other studies which concluded that there was a decrease in caries incidence from 5-12 years age group. [1, 8, 9-11]

However another study done by Retnakumari et al [12] showed contrasting results in comparison to our findings. The study reported that there was no increase in the rate of caries incidence on increasing age and prevalence of caries among 6 and 12 years of age was almost the same. The high caries prevalence in 6 years old could be due to less thickness of enamel in primary teeth as compared to the permanent teeth. [10] Thin enamel is more prone to carious attack leading to bacterial invasion moreover other factors like diet, increase in intake of sugar, the inability of young children to brush teeth on their own [13], economic constraints in rural areas, lack of dental facilities, less motivation due to lack of awareness

and education among parents of rural areas could be a reason leading to high caries rate in this age group. Structural and chemical differences of primary teeth could also be a reason for the high caries susceptibility. [14]

CPITN Code 2 was used to evaluate the prevalence of calculus in the two age groups and it was seen in our research that the overall prevalence of calculus was high in 12 years old age group (53.6%) as compared to 6 years old (46.3%). This was in accordance to the studies done by Mittal et al. [8], Mahesh et al. [15], Alexander et al. [16] which showed similar findings. This could be due to the onset of pre-pubertal changes, lack of oral hygiene maintenance, poor economic background, lack of funds for proper cleaning aids, shedding of primary teeth, use to various other ineffective cleaning aids like datun (neem sticks) and lack of motivational programs on oral health. In our study it was observed that the prevalence of calculus was high in males (63.1%) in 6 years old age group and in 12 years old age group it was high in females (59%). These results were in accordance with the study done by Mahesh et al. [15]

In the present study prevalence of malocclusion was found to increase with age. Prevalence of malocclusion was high (63.6%) among 12 years old age group as compared to 6 years old (36.3%) similar to studies done by Das et al. [1]. High prevalence was seen among females for malocclusion in both the age groups which in accordance with the studies done by Singh et al. [17] Reddy et al. [18]

The overall prevalence of dental diseases among 12-year old age group was high (54.1%) as compared to 6 years old school going children (45.8%).

The above data shows that there is a need for preventive approaches to tackle dental diseases and improve oral health status of the rural areas among children. The preventive approaches can be in the form of screening of diseases, organizing dental camps, educating school

teachers and parents so that there is awareness about oral hygiene practices. Health education programs should be provided through skits, televisions, radio to improve communicate oral health message to children so that a good oral health status could be achieved

Limitation of our study were many aspects like diet and oral hygiene practices were not taken into account and more research is needed on these aspects.

Conclusion

The study concludes that oral health status is important and awareness is required among the children and parents for its maintenance. Thus there is a need for preventive strategies and effective program implementation and this data could serve as a baseline for reducing the burden of oral diseases in rural areas of Barabanki.

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