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Original Research Paper

Dental Science

PREVALENCE OF EARLY C HILDHOOD CARIES AMONG SCHOOL CHILDREN ALONG WITH ITS ASSOCIATING FACTORS IN DISTRICT PAKKE KESSANG, ARUNACHAL PRADESH, NORTH EAST INDIA.

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ABSTRACT

Background: Dental caries is one of the most common chronic diseases of early childhood. Dental problems in early childhood have been shown to be predictive of future dental problems, growth and development by interfering with comfort, nutrition, concentration, and school participation. **Aim:** To find out the prevalence of ECC and possible associations among the children attending the schools of Pakke-Kessang district. Materials and Methods: School-based cross-sectional study among the selected schools children of 3-5 years of Pakke-Kessang district. **Result:** A total 600 subjects, 250 children were found to be having ECC (41.7%) and 350 children were not having ECC (58.3%). A significant association was found between the history of brushing teeth with and without tooth paste and ECC (P = 0.001). Prevalence of ECC was more among those who were consumed sugar more frequently than those who consumed less. **Conclusion:** Future health promotion and education programs in schools should include oral health issues and the risk factors for ECC, and its consequences should be addressed. Public-funded oral health program should be started and effective strategies should be developed to promote use of brush and paste for cleaning teeth, consumption of chocolates and sugars.

KEYWORDS : North east region, early childhood caries, prevalence

INTRODUCTION

Early childhood caries (ECC) is a serious dental problem that afflicts infants and toddlers. The first sign of dental caries lesions in infants who develop ECC is the appearance of white demineralization areas in the cervical regions of the maxillary anterior teeth. This serves to indicate high caries lesion activity in children. The appearance of a single caries lesion on any tooth surface in an infant or toddler must be considered a serious health problem.

It has been stated that ECC can be defined as the occurrence of any sign of dental caries lesions on any tooth surface during the first 3 years of life. When a 3-year-old child has a decayed, missing, or filled score of 4 or more, the condition is considered to be severe early childhood caries (S-ECC). ECC has a complex etiology, and there are still several unexplained interactions among factors such as infection with mutans streptococci (MS), the educational status of mothers, dental knowledge, stress, self-esteem, social status, family structure, and the use of baby bottles or nursing on demand.

Dental caries is a multifactorial disease. These factors include susceptible tooth and host, fermentable carbohydrates in the diet, cariogenic microorganisms, and time. Children with caries lesions in the primary dentition have a greater chance of developing same in the permanent dentition than children who are caries free in the primary dentition. Therefore, dental caries preventive initiatives can be planned and implemented for preschool children who are identified as being at risk.

India, with a population that exceeded 1.39 billion in 2021, is the second most populous nation in the world. Eighty percent of the population lives in rural areas. The oral health care system consists of medical research institutes with departments of dentistry, more than 120 dental schools spread throughout its 27 states, medical colleges with departments of dentistry in cities and district headquarters, and private dental clinics. The majority of dental care is provided in the latter.

Arunachal Pradesh is the largest of the Seven Sister States of Northeast India by area. It borders the states of Assam and Nagaland to the south and shares international borders with Bhutan in the west, Myanmar in the east, and a disputed border with China in the north at the McMahon Line. As of the 2021 population project, Arunachal Pradesh has a population of 17.49 lakhs and an area of 83,743 square kilometers. Pakke Kessang district is 25th district of the state, headquater by Lemmi. The state has universal primary education, near total literacy moderate life expectancy, low birth rates, and low infant mortality rates comparable to developed countries. School children attend both government-sponsored and private schools.

The drinking water, which is not fluoridated, is supplied through a public water supply. The other main sources for drinking water are from wells. Currently, no data are available on the caries lesion prevalence or possible etiological factors for school children in Arunachal Padesh, Northeast India. Therefore, this was conducted to determine the prevalence of ECC and possible associations with age, gender, tooth paste, brushing habits, diet and sugarintake a day.

METHOD AND MATERIALS

This study had the approval of head of the school, the Principal/Headmaster prior to beginning of the study. The sample consisted of children attending both government-sponsored and private schools that is running in the Lemmi, Pakke Kessang district who were between the age of 3 to 5 years. Six government and private schools were stratified and randomly selected for inclusion in the sample.

Study Population:

The study population was selected from various schools located in Pakke Kessng District based on socioeconomic status. Children belonging to the low socio-economic groups were those studying in the government schools and the high socioeconomic group comprised of children studying in private schools.

Inclusion Criteria:

Children between 3 to 5-years old age group enrolled in various selected schools of the town. Children who were fit and fine.

Exclusion Criteria:

Handicapped children; children with major debilitating illnesses.

Sample Size Distribution:
A total number of 600 school going children between the age of 3 to 5 years in Pakke Kessang District are examined.

Scheduling:
The data collection was scheduled during the school working hours. An average of 100 children were examined per day.

Data Recording:
Data concerning the independent variables were collected using a self-structured questionnaire. A questionnaire consists of gender, age, diet, brushing per day, sugar intake per day, tooth paste, dmft scores. The area for conducting examinations was planned and arranged for maximum efficiency and ease of operation. The exact arrangement was determined by the physical condition of the site. The children were seated in an ordinary chair that was positioned to ensure adequate day light to facilitate the examination. The recorder was made to sit close enough to the examiner so that the instructions and codes can be easily heard and the examiner can see that findings are being recorded correctly. An oral examination were done using a disposable mirror, wooden tongue spatula, and a torch light.

The American Academy of Pediatrics Dentistry defined ECC as the presence of one or more decayed (non-cavitated or cavitated), missing (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months of age or younger. The modified WHO criteria for caries lesions were used to diagnose caries lesions. No attempt was made to use a dental probe to confirm cavitation of the lesions due to the young age of the children.

Duration Of Study:
The study was carried out over a period of two weeks including period for data collection, statistical analysis, and writing the report.

Variables:
Age, gender, birth order of child, income of the family, Brushing per day, Tooth paste used, diet and Sugarintake a day.

Data analysis:
After initial analysis, the clinical and questionnaire data were analyzed further using SPSS-20 (Statistical Programme for Social Sciences). Age, gender, brushing, diet and sugarintake.

Initially, the percentage of children with ECC and the children without ECC within each variable category were compared using a cross-tabulation procedure and the relative proportions in each group were analyzed using the Chi-squared test of association at $p>0.05$ insignificant and $p<0.05$ significant.

RESULT

PREVELANCE OF CARIES AMONG THE VARIABLES:

AGE:
The number of study subjects from each age group of 3, 4, and 5 years of 600 children respectively. The three different years aged group children showed different result, for 3 years showed 30.8%, 4 years 33.3% and 5 years 35.8%. Result found to be insignificant. (Table 1)

GENDER:
Total 600 children were sampled for the study. Out of which 280 were boys and 320 were girls. The proportion of boys and girls in each age group were almost equal. The number of boys and girls in each class were also almost uniform. Distribution of subjects between private and government schools were also similar. Results were found to be insignificant when comparing dmft with gender. (Table 2)

BRUSHING:
Evaluation on brushing habit 350(58.3%) subjects not having caries in which 5(0.8%) were not brushing, 332(55.3%) were brushing once a day and 13(2.2%) subjects were brushing twice a day. 250(41.7%) subjects having caries in which 3(0.5%) were not brushing, 232(38.7%) were brushing once a day and 15(2.5%) subjects were brushing twice a day. Results were found to be insignificant in relation number of brushing per day. (Table 3)

TOOTH PASTE:
The children brushing teeth with and without tooth paste, 350(58.3%) subjects not having caries in which 335(55.8%) were using tooth paste and 15(2.5%) were not using tooth paste. 250(41.7%) subjects having caries in which 209(34.8%) were using tooth paste and 41(6.8%) were not using tooth paste. Results were found to be significant when comparing dmft with toothpaste. (Table 4)

DIET:
The vegetarian and non-vegeterian children different showed results 350(58.3%) subjects were not carious in which 339(56.5%) were having nonveg diet and 11(1.8%) were having veg diet. 250(41.7%) subjects were having caries in which 241(40.2%) were having non veg diet and 9(1.5%) were having veg diet. So the result found to be insignificant. (Table 5)

SUGAR INTAKE:
The test results found an association between the sugar consumption and dmft of in the school going children of 600, there was significant difference between three variables, the one who intaked sugar once daily, twice daily and thrice daily that is 33%, 66.2%, and 0.7%. (Table 6)

Table 1 Test Used- Chi Square, $p>0.05$ Insignificant And $p<0.05$ Significant

Dmft	3 Years	4 Years	5 Years	Total	Chi Square Value	Pvalue
Not ECC	111 18.5%	112 18.7%	127 21.2%	350 58.3%	0.707	0.702
ECC	74 12.3%	88 14.7%	88 14.7%	250 41.7%		
Total	185 30.8%	200 33.3%	215 35.8%	600 100.0%		

Table 2 Test Used- Chi Square, $p>0.05$ Insignificant And $p<0.05$ Significant

Dmft	Male	Female	Total	Chi Square Value	Pvalue
Not ECC	155 25.8%	195 32.5%	350 58.3%	1.193	0.167
ECC	125 20.8%	125 20.8%	250 41.7%		
Total	280 46.7%	320 53.3%	600 100.0%		

Table 3 Test Used- Chi Square, $p>0.05$ Insignificant And $p<0.05$ Significant

Dmft	None	Once A Day	Twice A Day	Total	Chi Square Value	Pvalue
Not ECC	5 0.8%	332 55.3%	13 2.2%	350 58.3%	1.744	0.416
ECC	3 0.5%	232 38.7%	15 2.5%	250 41.7%		
Total	8 1.3%	564 94.0%	28 4.7%	600 100.0%		

Table 4 Test Used- Chi Square, p>0.05 Insignificant And p<0.05 Significant

Dmft	Used	Not Used	Total	Chi Square Value	Pvalue
Not ECC	335 55.8%	15 2.5%	350 58.3%	25.291	<0.001***
ECC	209 34.8%	41 6.8%	250 41.7%		
Total	544 90.7%	56 9.3%	600 100.0%		

Table 5 Test Used- Chi Square, p>0.05 Insignificant And p<0.05 Significant

Dmft	Non Veg	Veg	Total	Chi Square Value	Pvalue
Not ECC	339 56.5%	11 1.8%	350 58.3%	0.095	0.758
ECC	241 40.2%	9 1.5%	250 41.7%		
Total	580 96.7%	20 3.3%	600 100.0%		

Table 6 Test Used- Chi Square, p>0.05 Insignificant And p<0.05 Significant

dmft	Once A Day	Twice A Day	Thrice A Day	Total	Chi Square Value	Pvalue
Not ECC	186 31.0%	163 27.2%	1 0.2%	350 58.3%	151.640	<0.001 ***
ECC	13 2.2%	234 39.0%	3 0.5%	250 41.7%		
Total	199 33.2%	397 66.2%	4 0.7%	600 100.0%		

PREVALENCE OF CARIES WAS 250(41.7%).

DISCUSSION

The schools in this study were stratified randomly and selected by a nondental administrator to enhance the representivity of the sample. ECC is defined as the presence of one or more decayed, missing, or filled tooth surfaces in any primary tooth in a child at 71 months of age or younger. By the time a child is 2 to 3 years of age, all primary teeth should have erupted and between the ages of 6 and 12, a mixture of both primary teeth and permanent teeth reside in the mouth. The 3 to 5 years age group have been selected in this study because in this age group all sets of primary teeth are present in the oral cavity, and also their easy accessibility and to ensure uniformity in sampling. So the prevalence of an early childhood caries can be identified easily. The prevalence of dental caries can be attributed to the preventive program undertaken locally, and also can highlights the importance and understanding of the local factors influencing ECC. Till date no study have done on the caries lesion prevalence and possible etiological factors for school children in Arunachal Padesh, Northeast India. So the aim of this study was to find the proportion of 3-5-year old children having the problem of ECC and recognize the factors that are associated for the problem. Previously many studies have done in various part of India excluding North East on prevalence of ECC among the children in school of 3-5 years age group.

Sethi and Tandon found that Prevalence rate of caries in Udupi was 65.5% in 3-5 years age group, and Srikanth K et al., concluded their study showed the prevalence of 41.9%. Whereas in this study, the prevalence is 41.7%. This difference might be due to the selection of specific population group, i.e. children belonging to schools where children get education on oral health, regular health checkups and supplementary nutrition. The children habit of eating chocolates, sweets and other cariogenic substances as compared with those who do not consumped. Also, they are given some tips for general and oral hygiene and may get some oral healthcare as a part of general healthcare. Seeding of good habits in children such as brushing the teeth, washing hands, etc.

In this study, no significant association was found between the age of the child and ECC. This finding does not coincide with the findings by Wendt L.K. in Sweden, Khristine Marie G. in Philippines, and Seval Olmez in Turkey. They found that higher age is associated with higher prevalence of ECC among the children. Same conclusion stated by Shah AF et al., their study showed a significant increase in the prevalence of ECC with increasing age ranging from 33.2% among 24–35 months old to 50.6% and 42.9% among 36– months old children, respectively.

Prevalence of ECC was found to be more among the boys than girls by Peressini et al. in Manitoulin, Ontario. However, in this study, no significant association was found between the sex of the child and ECC. The prevalence of ECC among the males (46.7%) and females (53.3%) was nearly equal.

In this study, tooth-brushing habit of the children were was identified 1.3% not brush daily, 94% once a day, and 4.7% twice a day. Several studies have shown that increased tooth-brushing frequency and parental involvement can decrease the occurrence of caries lesions on smooth surfaces. A major problem confronting the investigation of the relationship between tooth-brushing and ECC is the methodological issue of assessing the frequency of brushing, quality of plaque removal, and actual levels of oral hygiene. The questions regarding tooth-brushing were answered by the children, so these answers may be subject to recall bias.

In this study, 350(58.3%) subjects were not carious in which 186(31%) were taking sugar once a day, 163(27.2%) subjects were taking sugar twice a day and 1(0.2%) were taking sugar thrice a day. 250(41.7%) subjects were having caries in which 13(2.2%) were taking sugar once a day, 234(39%) subjects were taking sugar twice a day and 3(0.5%) were taking sugar thrice a day. Results were found to be significant when comparing dmft with sugarintake. Jose B et al.,concluded the highly significant role of sweets, chocolates, sugars, candies, and wafers in higher prevalence of ECC, which is coincide with our study.

There was inconsistent evidence for a link between following a vegetarian diet and dental caries. In our study there was no relevant between vegetarian and dental disease in children regard the ECC.

The prevalence of ECC in the present study was 41.7%. This is comparatively high compared with that in other places in India as per some Indian studies. Studies in Udupi and Davangere showed a prevalence of 19.4% and 19.2%, and 39.9% by Shah AF et al. respectively. However, a study in Kerala showed caries prevalence of 44%. The prevalence of ECC worldwide is highly variable ranging from 2.1% in Sweden to 85.5% in rural according to a systematic review of Ismail and Sohn. While the prevalence reported to be 11–53.1%, the prevalence in UK is 6.8–12%. This could be attributed to differences in case definitions and diagnostic criteria of ECC apart from risk factors.

An important finding of this study is that around 92.5% of children with ECC were untreated caries. Moreover, there was not a single tooth which were restored and all the children required treatment. This is an indicative of a total lack of awareness about oral health among parents, lack of accessibility, and affordability for oral health care in this section of people which is quite alarming.

CONCLUSION

1. The awareness, preventive and curative oral health

programs should be initiated for children.

2. Oral healthcare providers should be aware of associating factors for ECC. Future health promotion and education programs in school should include oral health issues and the risk factors for ECC, and its consequences should be addressed.

3. Public funded oral health programs should be started. Effective strategies should be developed to promote the use of brush and paste for cleaning teeth and discourage inappropriate brushing, consumption of chocolates and sugars. Non-sugar-based chocolates and candies available in the market should be promoted among the children

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