



Paediatric Dentistry

A STUDY ON DENTAL CARIES PROPORTION IN CHILDREN AGED 3-12 YEARS VISITING THE OPD OF A RURAL MEDICAL COLLEGE

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ABSTRACT **Background** Dental caries is one of the most common non-communicable diseases in children around the world. It greatly influences the health and well-being of the child. It can affect their jaw structure, speech and can even impact their personality and sleep. **Objectives** The aim of this study was to determine the prevalence and related risk factors of dental caries in children in a rural area. **Methodology** A descriptive cross-sectional study was conducted in children aged 3-12 years visiting the OPD of a rural medical college in Thiruvananthapuram, Kerala from July to September 2023. Dental caries was examined by oral examination using a disposable tongue spatula under torch light and denoted by the decayed, missing, filled teeth score. Data acquired by printed questionnaire was then subjected to SPSS and analyzed with chi-square test. **Results** There were 180 boys and 169 girls among the 349 participants. The study showed that 127 participants (36.4%) had caries. 34 children (25%) under 6 years of age, i.e having primary dentition, had caries with dmft index of 2.41+/-1.45 and 93 children (43%) above 6 years of age, i.e having permanent dentition, had caries with a DMFT index of 2.63+/-1.78. The relationship between the frequency of consumption of sweets and early childhood caries was found to be statistically significant ($p < 0.042$). The relationship between current caries and prior positive history of caries in primary dentition was found to be statistically significant ($p < 0.001$).

KEYWORDS : Early Childhood Caries, Oral Hygiene Habits, School Going Children, Sweets

INTRODUCTION

Dental caries is one of the most common chronic, preventable, non-communicable diseases affecting children. It has become a serious public health concern and is on the rise worldwide. The disease is multifactorial in origin due to the involvement of cariogenic microorganisms, carbohydrates, inadequate oral hygiene, and a range of uncontrollable social variables. While early stages of dental caries are often asymptomatic, later on it may lead to pain, infections and abscesses, tooth extraction or even eventually resulting in sepsis.⁽¹⁾ It may influence a child's learning ability and has a lasting negative impact on dentition as well as jaw structure. The pain associated with dental caries has a detrimental impact on their sleep, emotional maturity, social life and ability to perform their normal activities.⁽²⁾

The prevalence of dental caries in children shows a decreasing trend in developed countries such as in the USA where prevalence is reported to have fallen from 25 percent to 18 percent.⁽³⁾ Whereas in developing countries such as in Africa the prevalence was reported to be around 45 percent.⁽⁴⁾

In a developing country like India, the burden of caries has always been high and has not yet experienced a downward trend. With reports of upto 57 percent prevalence in the 3-18 years age group.⁽⁵⁾ It shows a varying trend from region to region, with upto 79 percent prevalence in one study conducted in school going children by Anand et al⁽⁶⁾. In Kerala, few studies showed a high prevalence rate. One of these studies conducted by Nithya et al⁽⁷⁾ showed a significant 49.1 percent prevalence, which is alarming.

This study is an effort to determine the proportion of caries and evaluate its associated risk factors among children aged 3-12 years coming to the OPD of a rural medical college in Thiruvananthapuram district.

METHODOLOGY

A descriptive cross sectional study was conducted in children aged 3-12 years coming to the OPD of a rural medical college in Thiruvananthapuram, Kerala, from July to September 2023. Institutional Ethical Committee clearance was procured, and the consent for examining the children was obtained from concerned authorities before the commencement of the study. All the children who were cooperative, in the age group of 3-12 years and accompanied by their parent were included in the study. Exclusion criteria comprised of those children with developmental delay and those whose parents did not wish to participate in the study.

Non probability simple sampling technique based on convenience was used to select the participants. Dental caries was assessed using a disposable tongue spatula under torch light by doctors who were trained by the principal investigator and denoted using decayed, missing and filled teeth (DMFT score). The factors associated with caries were assessed by a semi structured questionnaire based on "oral health questionnaire for children" by the World Health Organisation.⁽⁸⁾ This printed questionnaire was filled in by the caretaker of the child, by interview, after taking proper consent. 349 children in total took part in the study. The collected data was entered in MS Excel sheet and analyzed using SPSS software.

The factors influencing dental caries such as age, sex, place of residence, type of toothpaste, breastfeeding period, initiation of complementary feeding, sugary treats consumption, whether child was on an MDI (metered dose inhaler), brushing regimen, prior caries in primary dentition, previous dentist visits were assessed by the chi-square test.

RESULTS

Of the total 349 participants, 127 children (36.4%) had caries. There were 225 children in the age group 3-6 years of age, 81 children in the age group 7-9 years of age and 43 children in the age group 10-12 years of age, of these 79, 31 and 17 had caries respectively. 51% were boys and the rest girls. The prevalence of caries was 34.6% and 38.3% in boys and girls respectively. Table 1 shows the proportion of caries in the age groups

Table 1; Proportion of caries among the age groups

		CARIES		CARIES PRESENT
		NO	YES	%
AGE GROUPS	3-6 YEARS	146	79	35.1
	7-9 YEARS	50	31	38.2
	10-12 YEARS	26	17	39.5
TOTAL		222	127	36.4

The study population was made up almost entirely from rural areas (Rural-89% and Urban-11%). 25% of children under 6 years of age, i.e having primary dentition, and 43% of children above 6 years of age, i.e having permanent dentition, had caries. Table 2 shows the frequency of caries among children assessed using dmft and DMFT index along with percentage distribution. (DMFT score - children above 6 years of age and dmft score - children below 6 years of age.)

Table 2: Percentage distribution of caries denoted by dmft and

DMFT score.

DMFT	COUNT	PERCENTAGE
NIL	121	56.5
1-5	85	39.7
>5	8	3.0
dmft	COUNT	PERCENTAGE
NIL	101	74.8
1-5	32	23.7
>5	2	1.0

Of the participants 52% brushed their teeth twice daily and 42% brushed their teeth once daily. Of these 37.5% and 35.8% of the children presented with caries. 3 children brushed 2-3 times a week and 2 children each brushed once a month or never at all but interestingly only one child presented with caries. 34% consumed sweets, soft drinks or biscuits twice or more daily and 42% consumed once daily. Of these 41.3% and 37.4% of children had caries. An interesting observation was that children below 6 years who consumed sweets once a week, 2-3 times monthly or never did not present with caries. Only a mere 24% gave a history of previous dental visits.

Early childhood caries is defined as caries in children lesser than 71 months of age⁽¹⁾. In our study, the prevalence of ECC was 25.1%. 29.6% of mothers with children less than 6 years of age breastfed the child until 2 years since birth while 24.4% breastfed well until 2 1/2 years of age. Of this 42.5%, and 24.2% of the children had caries. 81.4% of mothers with children less than 6 years of age initiated complementary feeding at 6 months of age, of which 28.1% children presented with caries. Caries was present in 9 out of 27 children who were on metered dose inhaler. 42.7% of parents were unaware whether the toothpaste they used contained fluoride or not while 23.2% used toothpaste without fluoride.

The relationship between frequency of consumption of sweets, soft drinks or biscuits and early childhood caries was found to be statistically significant with p value <0.042. Also the relationship between previous occurrence of caries in primary dentition and current caries was found to be statistically significant with a p value <0.001. Table 3 illustrates the findings.

Table 3: Factors associated with caries

		EARLY CHILDHOOD CARIES		%	χ ²	P VALUE
		NO	YES			
SWEETS, SOFT DRINKS OR BISCUITS	TWICE OR MORE DAILY	32	16	33.3	11.494	0.042
	ONCE DAILY	37	17	31.4		
	2-3 TIMES PER WEEK	22	1	4.3		
	WEEKLY ONCE	3	0	0		
	2-3 TIMES PER MONTH	4	0	0		
	NEVER	3	0	0		
		PRESENCE OF CARIES		%	χ ²	P VALUE
		NO	YES			
PRIOR CARIES IN PRIMARY DENTITION	YES	15	47	75.8	50.605	0.001
	NO	207	80	27.8		

P VALUE <0.05 IS STATISTICALLY SIGNIFICANT

DISCUSSION

Dental caries is considered as one of the most commonly ignored chronic diseases in children. Children are at the mercy of their parents till a certain age and hence are more prone for caries if the caregivers do not teach proper hygiene practices or provide a balanced diet.⁽⁹⁾

Our study included children who had primary dentition as well as children who had permanent dentition. Hence we were able to elucidate the proportion of ECC as well as caries in the school going population. The prevalence of ECC in our study was 25.1%. In Kerala, few studies of prevalence of caries in this age group has been done,

probably due to the difficulty of access. We got a mean dmft of 2.41 +/- 1.45 (mean +/- standard deviation) which is in comparison with other studies⁽⁹⁾. School going children showed a mean DMFT index of 2.63 +/- 1.78. This is slightly higher than those recorded in previous studies.⁽¹⁰⁾

Proportion of caries was seen to increase with age with 38.2% and 39.5% in age groups 7-9 and 10-12. This is in accordance with previous studies⁽¹⁰⁾. This may be due to the fact that children change their food preferences and oral hygiene practices when they grow which may be responsible for increased risk of caries. The greater prevalence of caries in girls may be attributed to the high sex ratio in Kerala and may also be indirectly linked to the rising incidence of early menarche due to obesity in women.⁽¹¹⁾

A higher incidence of caries is seen in children who brush their teeth only once a day compared to those who brush twice daily. This is in support of previous studies which state that oral hygiene habits are directly linked to the risk of carious lesions. Parental assistance and guidance are hence essential due to the lack of proper technique and knowledge to maintain oral hygiene in preschool children. Absence of caries in those children who brush once weekly and never, may be due to alternative methods of oral hygiene such as ayurvedic methods.

There was a strong correlation between ECC and frequency of consumption of sweets and sugary treats. In our study, 37-41% of those who consumed sweets once or more daily had caries. This may be due to the reduced resistance of primary dentition to caries as compared to permanent dentition. Also the children who abstained from sweets had no incidence of caries. Hence, limiting sweets together with a proper balanced diet containing fruits and vegetables is important.

We also found an important correlation between prior history of caries in primary dentition and present caries. 75.8% of children who gave a prior positive history of caries in primary dentition presented with caries. This may be due to the fact that hygiene habits learned early on are maintained with age. Hygiene habits of preschool children are modeled by family behavior and what is taught to them. Hence, it is extremely important to instill good hygiene habits at a young age.

No significant association was found between breastfeeding duration or time of initiation of complementary feeding and that of incidence of caries. An interesting observation was that one in three children on MDI presented with caries. This is significant because children on MDIs should be instructed to wash their mouths regularly to prevent oral candidiasis which should reduce their risk of developing carious lesions.

An alarming observation is the fact that 42.7% parents were unaware whether the toothpaste used contained fluoride or not. Which illustrates a need for creating awareness about fluoride in toothpaste and its importance. Only a meager 24% of the children gives history of previous dentist visits. This may be due to the lack of access to dental care facilities in a rural area or a lack of awareness about the importance of dental hygiene. Early loss of primary dentition, may lead to less space, crowding and misalignment in the permanent dentition.⁽¹²⁾

CONCLUSION

Our study shows a relatively high caries prevalence of 36.4%. There is an urgent need to implement oral health programs for creating awareness in parents. It is crucial to counsel parents and caregivers about the importance of instilling healthy habits like proper oral care, healthy balanced diet and regular dentist visits so that children can learn to take care of their teeth. These habits transmit to the next generation when they become parents. In the present day, people are starting to become more concerned with their own well-being and health, in spite of this a majority of parents still choose to not take care of the primary dentition of their children mostly because they do not understand the importance of primary dentition. Hence we need to counsel parents more actively and create more awareness.

FOOTNOTES

Ethical Clearance - Taken from Institutional Ethical Committee, Sree Uthradom Thirunal Academy of Medical Sciences 2023.

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Conflict Of Interest - None

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