

PATTERNS AND FREQUENCY OF DENTAL CARIES IN PRIMARY TEETH

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ABSTRACT

Primary teeth play an important role in mastication, speech and occlusion of permanent dentition. Due to high prevalence of dental caries in primary teeth, it is essential to educate parents about prevention and management of dental caries of children.

The objective of this study was to determine the pattern and prevalence of caries in primary teeth among children reporting to Khyber College of Dentistry, Peshawar.

Total 900 children having age 4 to 7 years were included in this study. Dental caries was assessed using sterilized mouth mirror and dental probe under dental chair light in primary teeth. The collected data were analysed in SPSS version 16.0. Percentages and frequencies were calculated for examined and affected teeth. Z-test was applied for statistical difference among girls and boys. $P < 0.05$ was considered significant.

Out of total of 900 children, 478 (53.11%) affected by caries. The posterior teeth had greater prevalence of caries. In anterior teeth, central incisors (10%) followed by lateral incisors (8.09%) were affected by dental caries. Canine (3%) were least affected. In posterior teeth, second molars were affected more than first molars by caries. Girls were having less caries than boys. ($p < 0.05$).

Key Words: Prevalence of caries, primary teeth, patterns of caries.

INTRODUCTION

Dental caries is an infectious, communicable disease, which causes destruction of teeth by acid-forming bacteria found in dental plaque. The most important concept to remember is that caries is a dynamic disease process, and not a static problem. Secondly, before a cavity is formed in the tooth, the caries infection can actually be reversed.¹ Caries progression or the balance between protective and pathological factors in the mouth determines reversal. The development of dental caries is a dynamic process: demineralization of the hard dental tissue by the acidic products of bacterial metabolism – alternating with periods of remineralization. The development of the carious lesion is episodic, with periods of demineralization alternating with periods of remineralization. The lactic acid produced by the cario-

genic bacterial dissolve the calcium phosphate mineral of the tooth enamel in a process called demineralization. Baby teeth have thinner enamel than permanent teeth, making them very susceptible to caries.² Dental caries in children is typically first observed clinically as a “white spot lesion.” If the tooth surface remains intact and non-cavitated, then remineralization of the enamel is possible. If the subsurface demineralization of enamel is extensive, it eventually causes the collapse of the overlying tooth surface, resulting in a “cavity.” Saliva has a critical role in the prevention of dental caries. Saliva provides calcium, phosphate, proteins, lipids, antibacterial substances, and buffers. Saliva buffering can reverse the low pH in plaque, and with a higher pH, calcium and phosphate can be driven back into the tooth enamel. One factor that lowers the risk of cavity formation is normal salivary flow. Anything less than 0.7 ml/minute increases the risk for cavity development.³

The term Early Childhood Caries (ECC) was suggested at a 1994 workshop sponsored by the Centers for Disease Control and Prevention.⁴ The American Academy of Pediatric Dentistry defines Early Childhood Caries (ECC) as the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary teeth

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in a child of 18 months of age or younger. In children younger than 3 years of age, any sign of smooth-surface caries is indicative of severe early childhood caries (S-ECC). From ages 3 through 5, 1 or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth or a decayed, missing, or filled score of 4 <(age 3); 5 <(age 4); or 6 <(age 5) surfaces constitute S-ECC.⁵

Although dental caries has been declining globally in general population, more so among older children, the caries prevalence in younger ones has not shown a significant decline. The parents support and involvement in the child's oral health care are important in influencing the dental health of child.⁶ Mahejabeen et al⁷ showed overall 54.1% prevalence of dental caries. Gupta AK et al⁸ found prevalence of dental caries as follows: 70%, 53%, 25%, 50.8% and 51.46% in the age group of 5-6 years in Bangalore (Urban), Davangere (Urban), Davangere (Rural) Andhra Pradesh (Rural) and Kerala (Rural) respectively. Few other investigations have also demonstrated varied prevalence in the same age group range.^{9,10} The objective study was to determine the pattern and frequency of caries in primary teeth among children reporting to Khyber College of Dentistry, Peshawar.

METHODOLOGY

This study was conducted in OPD paediatric department of Khyber College of Dentistry, Peshawar from September 2014 to March 2015. A total of 900 children between 4 to 7 years were included in this study. The purpose, procedures, risk and benefits of the study were explained to their parents. An informed consent was taken.

TABLE 1: AGE AND GENDER DISTRIBUTION OF STUDY

Gender	Participants	
	Total No. of patients	Patients with caries
Boys	450	240(53.33%)
Girls	450	238(52.8%)
Total	900	478(53.11%)

TABLE 2: PATTERNS OF DENTAL CARIES IN CHILDREN'S PRIMARY TEETH

Type of tooth (primary)	Males n (%)	Females n (%)	Total n (%)	Z score	P-value
Central incisor*	24(10)	19(7.9)	43(8.9)	6	0.000
Lateral incisor*	17(8.09)	12(5.2)	29(6.62)		
canine*	6(3)	4(2)	10(2.4)		
1st molar*	38(20)	30(15)	68(17.4)		
2nd molar*	39(21)	33(16.9)	72(18.9)		

*z-test, comparison were made between girls and boys

Both genders, which were cooperative, were included in the study. Mentally and physically handicapped and uncooperative children were excluded from study. Dental caries was assessed using sterilized mouth mirror and dental probe under dental chair light. Caries were recorded only in primary teeth. No classification or index was applied for caries assessment because the intention was just to know about the prevalence among different primary teeth. No x-ray were taken for caries examination. The collected data were analysed in SPSS version 16.0. Percentages and frequencies were calculated affected teeth. Z-test was applied for statistical difference among girls and boys. P<0.05 was considered significant.

RESULTS

A total of 900 children was included in this study. Four hundred and fifty males and 450 females with female to male ratio 1:1 were in this study. Of total 900 children the 478 (53.11%) children affected by dental caries. The details are given in Table 1.

The posterior teeth had greater prevalence of caries. In anterior teeth, central incisors followed by lateral incisors were affected by dental caries. Canine were least affected. (Table 2) In posterior teeth, 72(18.9%) second molars and 68 (17.4%) first molars were affected by dental caries. Girls were had less affected by dental caries than boys. This difference was statistically significant. (p<0.05) (Table 2)

DISCUSSION

This study showed frequency of caries 52% among children primary teeth who visited Khyber College of Dentistry. A probable explanation for such high prevalence can be the following: low economic conditions and resources, ineffective fluoridation policy, inefficiency of healthcare system, availability and consumption of refined sugars, standard of oral health awareness among public, dietary and oral hygiene lifestyles, and motivation status of parents and children. Studies had shown a positive correlation between primary and secondary teeth caries, so prevention of primary dentition caries is important.¹¹

When compared to other developing countries, recent studies in Pakistan and India revealed that caries prevalence in preschool children in different regions of both countries is about 50-60%.^{12,13} On the other hand, caries prevalence in preschool children in some Arab countries like Saudi Arabia has been found to be high (approaching the 75%).¹⁴ In the present study, overall affected children more 50%. The studies by Dawani et al¹² and Mittal et al¹³ supported the present results. High prevalence of caries in Saudi's population may be due to high socioeconomic and soft diet uses as compared to Pakistani population. The other factor may be genetic immunity of dentition. No socioeconomic comparison were observed in the present study.

Aziz¹⁵ determined the prevalence of dental caries among a representative sample of preschool children (4-5 years old). Examined 1376 children for dental caries using the dmt index according to the WHO method. Seventy six percent of the studied children have already experienced dental caries at the age of 4-5 years (1046 children). The mean dmft score was found to be 2.46 while the other 24% of children were caries-free. There was no significant difference in caries prevalence between boys and girls (77.2% versus 74.6%). The high prevalence of than the current study may due to dietary habits and genetic factors.

In the present study boys were commonly affected by caries than girls with $p < 0.05$ (Table 1). This may be due to more consciousness among girls for oral hygiene. In contrast to the current findings Aziz¹⁵ showed no statistical significant among girls and boy in his study on Palestine population. In a study conducted in Peshawar school children by Meboob B et al¹⁶ reported that boys were more commonly affected than girls. These results are consistent with the current results.

In the present study, among the posterior teeth, primary first molars in both the arches are less susceptible to caries³ than the primary second molars, even though the former erupts at an earlier date. This suggests that in primary dentition, among 5 year olds, the second molar is the tooth with highest caries experience. This difference in individual tooth susceptibility is due to the fissure topography of molars. The pits and fissures in second primary molars are deeper and less completely coalesced.¹⁷ It is also evident that the sequence of caries attack follows a specific pattern: more posterior teeth than anterior teeth were predominantly affected by caries. This is similar to the caries pattern described by Chawla et al¹⁸ and Ralph E. McDonald¹⁹ for primary dentition. However, in a study in Peshawar schoolchildren by Meboob B et al showed that primary first molar the commonly affected tooth in the primary teeth. Meboob B et al¹⁶ included both the permanent and primary teeth in their teeth. In the present only

the primary teeth were studied for prevalence of dental caries.

Ilieva²⁰ conducted a study in Plovdiv (Europe), including 1124 children from 3 to 8 years of age — 536 girls and 588 boys, from randomly selected kindergartens and schools in Plovdiv incidence of caries of primary teeth (41%) were recorded. No statistically significant difference was found between the values of the two genders. The frequency of primary carious teeth in European population is less than in our population. Effective fluoridation and other caries preventive measures may responsible for this difference.

In 1992 a study was conducted in Lahore by Khan AA et al²¹ reported that boys were more commonly affected than girls. Another study carried out by Umer A et al²² in school children in Peshawar reported that 72.4% were by dental caries. In the present 53% children had caries. The difference in caries rate may due to the present study only included the primary teeth while Umer A et al²² included the permanent teeth as well. Most the local studies^{16,21,22} carried combine on primary and permanent teeth and individual primary teeth caries prevalence have studied so the objective to know the patterns of dental caries in primary teeth only.

CONCLUSION

The primary carious frequency are much in our population. Due to high prevalence of dental caries in primary teeth, it is essential to educate parents about prevention and management of dental caries in children.

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