Original Article

The prevalence and pattern of cavitated carious lesions in primary dentition among children under 5 years age in Sirsa, Haryana (India)

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Abstract

Background: To determine the prevalence and pattern of cavitated carious lesions in primary dentition in children below 5 years of age in Sirsa, Haryana. **Aims:** The aim of this study was to evaluate the status of dental caries in primary dentition and compute data for planning anticipatory programs in children aged less than 5 years. **Settings and Design:** The study was conducted among children attending the outpatient department of pedodontics, JCD Dental College, Sirsa, Haryana (India) from April to December 2014. **Materials and Methods:** This study consisted of 576 children of both sexes (311 males and 265 females) up to 5 years of age. Dentition status and treatment proforma (WHO, 1997) was used to assess the prevalence of cavitated carious lesions. Selection of children for the study was done by simple random sampling method. **Statistical Analysis:** Chi-square test and *t*-test were used to compute data for statistical analysis. **Results:** 33.85% of children in the study population showed presence of cavitated carious lesions. Males showed slightly higher prevalence of cavitated carious lesions than females ($P = 0.35$). Incidence of caries was higher in mandibular arch in both the sexes (males $P = 0.9$, females $P = 0.7$) and in posterior teeth (both sex wise and arch wise). Higher caries prevalence was noticed in maxillary anterior teeth ($P = 0.04$) and mandibular posterior teeth ($P = 0.7$). Primary second molars showed highest caries prevalence ($P = 0.39$) in both the arches and sexes. **Conclusion:** The mean prevalence of cavitated carious lesions in primary dentition was found to be 33.85%. Males were more affected than females. Mandibular molars and maxillary anterior teeth were the predominantly affected teeth. Mandibular anterior teeth were least affected. The increase in incidence of cavitated carious lesions shows that there is necessity of implementing dental health awareness programs and modifications in types of food consumed are needed to eliminate the cause of decay.

Key words: *Carious lesions, cavitation, dental caries, prevalence, prevalence pattern, primary dentition*

INTRODUCTION

Dental caries is found to be the most vulnerable oral health issue and is a widespread oral disease in children around the globe. The prevalence of cavitated carious lesions is of abundant concern over ages and is a predominant topic of several epidemiological studies

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conducted in India and abroad. Apart from causing damage to the tooth, this disease is also responsible for numerous irrational disorders of mouth and other body systems (WHO, 1981).[1] Cavitation in primary teeth has been widely studied worldwide, since it is found as the most dreadful oral disease that affects children.[2] However, figures to determine the prevalence of this disease in the western region of Haryana state are insufficient.

It is remarkably necessary to study the prevalence of cavitated carious lesions in preschool and school children in western part of Haryana to give a fair description about the situation of oro-dental health and to make future plans in order to reduce the incidence of cavitation as much as possible.

Many countries have developed different strategies to abate and eliminate dental caries from school children by conducting various studies on dental caries. As of now, these studies have given satisfactorily concluding results by implementing water and salt fluoridation and by conducting dental health awareness programs, school dental health programs, and many more, but availability of all these resources in a developing country like India is still scanty.

Dental caries influences 60–90% of the young population and adults extensively.[3] As directed by WHO, basic oral health surveys are divided into five distinct groups (i.e. 5 years, 12 years, 17–18 years, 35–44 years, and 65–74 years) to gauge the sternness of problem and plan interventional undertakings.[4]

In the context of achieving success by concentrating on the oral health, several problems still remain unsolved, especially in the underprivileged and underdeveloped countries like India. History illustrates that dental caries, periodontal diseases, and oral cancer are the primary fundamentals of comprehensive disease liability. Thus, in charge of the circumspection of literature on these topics, a contemporary survey was designed to gather statistics about the oral health of children below 5 years of age attending JCD Dental College, Sirsa (Haryana). This baseline data will help to plan preventive measures and restorative care for children. As oral health status is an essential part of the general form of the body, it is better to target and focus on the oral health of an individual in budding and blooming stage to have a good brunt on their impending overall well-being too. Professional care, health education, and personal inspiration can be beneficial to get over these diseases and would be a healthy effort toward an improved oral health.

MATERIALS AND METHODS

A cross-sectional study was conducted on children aged less than 5 years, attending the Department of Pedodontics, JCD Dental College, Sirsa, Haryana, India for routine dental treatment. Selection of children for the study was done by simple random sampling method. The study was conducted from April to December 2014. The children were examined clinically by a calibrated examiner after obtaining prior permission from the parents and the head of the institution. To gauge the validity and consistency of the study design, a pilot study was designed and carried out on 50 children before planning the final study.

The study population consisted of 576 children in total (311 males and 265 females). Each candidate underwent an intraoral examination using a sterile dental mirror and explorer under a dental chair's light. The presence of cavitation was considered to be indicative of caries in accordance with the measures recommended by WHO in 1997.[5-7] All data forms were tested for completeness and consistency. The data were computed and evaluated using the SPSS program. Statistical analysis was done using the Chi-square test and *t*-test. Confidence level and level of significance were fixed at 95% and 5%, respectively.

Inclusion criteria

Both males and females less than 5 years of age were included in the study.

Exclusion criteria

- Any ward more than 5 years of age
- Wards having any systemic or congenital illness
- Wards who had undergone any emergency treatment.

RESULTS

The study was conducted on 576 children below 5 years of age. It included 311 (54%) males and 265 (46%) females.

The total prevalence of cavitated carious lesions in the study population was 33.85%. Prevalence of cavitated carious lesions was higher in males (34.72%) as compared to females (32.83%). But statistically, it was not significant ($P = 0.35$) [Table 1].

On comparing the right and left sides of the oral cavity, the pattern of cavitated carious lesions showed

a bilateral phenomenon (right side = 28.47%, left side = 29.51%). In males, the caries prevalence was 28.93% and 31.51% (right and left sides, respectively) and in females, the caries prevalence was 27.92% and 27.16% (right and left sides, respectively) [Table 2].

Mean caries distribution was found to be significant in maxillary anterior segment in both the sexes ($P = 0.04$) and for the rest of dentition, it was not found to be significant [Table 3].

Mean caries distribution was higher in primary second molars when compared to primary first molars, but this difference was statistically not significant [Table 4].

Mean caries distribution was found to be statistically highly significant among maxillary anterior and mandibular posterior segments ($P = 0.000$ and $P = 0.001$, respectively) [Table 5].

DISCUSSION

The prevalence of cavitated carious lesions in primary dentition in children aged less than 5 years in Sirsa, Haryana (India) was found to 33.85%. The number of males (54%) who participated in the study was more than the number of females (46%). In the present study, males were found to be more affected than females (34.72% and 32.83%, respectively), which is suggestive of some predisposition for sex. Similar findings were recorded by Infante and Gillespie[8] and Zerfowski *et al.*[9] The higher prevalence of cavitated carious lesions in males was attributed to early eruption and longer retention of primary teeth in males as compared to females.[10] This discrepancy can be attributed to one or more of the following reasons: Inter-meal snacking by consuming refined sugars, lack of oral health awareness, improper oral hygiene measures, improper lifestyle and motivation status of parents, lack of availability or inefficiency of healthcare system, inequality in economic conditions and resources.[11]

The relationship in cavitated carious lesions when compared arch wise was distinct, wherein the mandibular arch was more affected than the maxillary arch, as shown in the report of Sathe.[12] In the current study, when inter-arch comparison was done, the prevalence of cavitated carious lesions was higher in the mandibular arch. Similar findings were reported by Tewari and Chawla[13] and Jawadekar *et al.*[14] Nonetheless, a study done by Healey and Gheyne Cheyne[15] showed higher caries prevalence in maxillary arch.

Table 1: Total prevalence of cavitated carious lesions among children

Age in years	Sex	Examined	Caries		*P*
			n	Percentage	
<5	Male	311	108	34.72	0.35
	Female	265	87	32.83	
	Total	576	195	33.85	

Test applied: Chi-square test

Table 2: Prevalence of dental caries on the right and left sides of oral cavity

Sex	Examined	Right side		Left side	
		n	Percentage	*n*	Percentage
Male	311	90	28.93	98	31.51
Female	265	74	27.92	72	27.16
Total	576	164	28.47	170	29.51

Table 3: Mean sex wise caries distribution in maxillary and mandibular anterior and posterior teeth

Sex	*n*	Mean	Std. deviation	*P*
Maxillary anterior				
Males	311	0.41	1.13	0.04*
Females	265	0.24	0.78	
Mandibular anterior				
Males	311	0.06	0.53	0.32
Females	265	0.04	0.24	
Maxillary posterior				
Males	311	0.33	0.84	0.9
Females	265	0.34	0.91	
Mandibular posterior				
Males	311	0.53	1.10	0.7
Females	265	0.56	1.16	

*Test applied: t-test. *Indicates statistically significant difference at P≤0.05*

Table 4: Mean caries distribution among first and second primary molars

Molar type	Mean	Std. deviation	*P*
First molar	0.41	0.99	0.39
Second molar	0.46	1.01	

Test applied: t-test

Table 5: Mean caries distribution in maxillary and mandibular anterior and posterior teeth

Arch type	Mean	Std. deviation	*P*
Maxillary anterior	0.33	0.99	0.000*
Mandibular anterior	0.05	0.42	
Maxillary posterior	0.34	0.87	0.001*
Mandibular posterior	0.54	1.13	

*Test applied: t-test. *Indicates statistically significant difference at P≤0.05*

Dental caries presented as a bilateral phenomenon when prevalence relationship of right to left side of the

oral cavity was compared. Similar observations were presented by Finn,[16] Dunning,[17] and Jawadekar *et al*.[18]

The present study showed a higher caries distribution in posterior teeth when compared to anterior teeth in both males and females. These results were in accordance with the study conducted by Infante and Gillespie[8] and Chawla *et al*.[18] This is attributed to the varied morphological pattern of the posterior teeth.[12,19]

In the present study, primary first molars in both the arches showed less susceptibility to dental caries when compared to primary second molars, though the former ones erupt at an earlier age. This suggests that the tooth with highest caries attack in primary dentition is second molar.[16,20,21] This discrete variation may be due to varied fissure topographic pattern and also the deep and less conjoined pits and fissures in primary second molars.[16,22]

The mandibular incisors were unaffected in the present study. This suggests an early childhood caries pattern where the predominantly affected teeth are maxillary primary incisors followed by maxillary and mandibular primary molars and mandibular primary incisors are unaffected.[18,23,24]

The prevalence and pattern of cavitated carious lesions in primary dentition among children under 5 years age of Sirsa (Haryana) depicts significant deficiency of oral health care at home and school, which necessitates starting "School Oral Health Program" in different regions of the district. The Ministry of Health should implement such programs and finance them properly. It would be most likely easy to inhibit decay in primary dentition and lower the incidence of caries prevalence in young children. This can be done at preschool age and in young children by imparting good oral health education to the parents and by teaching them how they can take care of their children's teeth soon after the first tooth erupts. Stress should be given on children's feeding habits, and introduction of toothbrush and kid's toothpaste is equally important.[25]

Parents should be constantly encouraged to visit community dental clinics funded by health ministry or to a remote dentist before their kids are 1 year of age. They would be able to update themselves about dental health education programs and community topical fluoride application campaigns. Mobile dental clinic set-ups may be helpful in reaching rural areas where dental services are not available. Primary preventive measures like professionally applied topical fluorides and pit and fissure sealants can be introduced which can improve the situation of oral health in children going to kindergartens and nurseries.

Also, fresh graduates can be employed to provide primary preventive measures for children in preschools and playschools, such as application of fluoride varnish in primary dentition, educating parents and teachers about basic oral hygiene measures and the use of toothbrush for preschool children, arrangement for regular dental check-ups, and suggesting healthy nutritional diet.

CONCLUSION

The mean prevalence of cavitated carious lesions in primary dentition was 33.85%. A higher incidence was noticed in males than in females (34.72% and 32.83%, respectively). Mandibular molars (13.67%), maxillary molars (8.43%), and maxillary anterior teeth (5.51%) were predominantly affected. Mandibular anterior teeth were least affected (0.75%). The increase in incidence of cavitated carious lesions shows that there is necessity of implementing dental health awareness programs and modifications in types of food consumed are needed to eliminate the cause of decay.

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Conflicts of interest

There are no conflicts of interest.

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