

Pattern of dental caries and treatment needs in deciduous dentition of children visiting Kantipur Dental College

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Abstract

Background:

Dental caries is a significant oral health problem in children which compromises the overall well being of the child. The pattern of caries distribution in the deciduous teeth is not symmetrical with some teeth being more prone to decay as compared to the others.

Aims and objective:

This study was conducted with the aim to identify the pattern of distribution as well as the treatment needs of children, aged 2 to 7 years, with untreated dental caries.

Material and methods:

321 children aged between 2 to 7 years visiting the pediatric dental department for routine dental visit were evaluated in the present study. Only children with untreated dental caries and intact deciduous dentition were included.

Result:

The study showed that the lower posterior (mean: 2.24), upper posterior (mean: 1.95) and upper anterior (mean: 1.67) region were more prone to caries as compared to lower anterior (mean: 0.21) where least amount of caries were seen. In addition it was noted that restoration (75.49 %) was the major treatment need in the children.

Conclusion:

The caries pattern in children between 2 to 7 years shows the nursing caries type of pattern with mandibular anterior showing least amount of caries. Most of the children who visit the hospital require less invasive treatment like restoration as compared to extraction and pulp therapy.

Keywords:

Dental caries, dental caries pattern, deciduous dentition, treatment needs

INTRODUCTION:

Dental caries is one of the most prevalent chronic diseases affecting humans caused by complex interaction of factors over a period of time¹. It is defined as a "bacterial disease of calcified tissues of teeth characterized by demineralization of inorganic and destruction of organic substance of tooth". The disease not only causes tooth damage but is also associated with various morbid

conditions of the oral cavity and other systemic problems^{2,3}.

Children are very important part of a country's demography and their health determines the nation's future. Dental caries is the most common chronic childhood disease, being at least five times more common than asthma^{3,4}. The oral health status of children has improved in recent years in the developed countries but the prevalence and

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severity of dental caries in developing countries are still high particularly in the primary teeth¹.

The prevalence pattern of dental caries varies with age, socioeconomic status, race, food and oral habits². Habits such as prolonged bottle feeding, frequent use of commercial weaning foods, ready availability of sweets and sweet drinks and insufficient use of fluoride toothpaste have been documented to be associated with a high level of caries in this group⁵.

Decay present in primary dentition is the best predictor of decay in the permanent dentition^{1,6}. All the teeth do not show equal susceptibility to caries. The site variability have been linked to factors like tooth morphology, saliva and bacterial ecology at the sites^{2,7,8}. Among the primary dentition, some studies reported the molars to be more prone to caries while some suggested otherwise⁹.

The present study was undertaken with the aim to identify the pattern of caries distribution in the deciduous dentition and also to assess the treatment needs in children with untreated dental caries.

Material and Methods:

This study was conducted in the Pediatric Dentistry department in of Kantipur Dental College teaching hospital and research centre, Kathmandu from April 2012 to April 2013. 321 children aged between 2 to 7 years visiting the department for routine dental check up were evaluated in the present study.

The patterns of untreated dental caries distribution for all the deciduous teeth in the upper and lower arch were noted in each child. Children having all the deciduous teeth intact were included in the study. Caries free children and children with unerupted or exfoliated deciduous teeth were excluded from the study.

The treatment needs in the children were divided into 3 groups:

Category 1: Carious teeth needing extraction.

Category 2: Carious teeth needing restoration

including deep caries management.

Category 3: Carious teeth with pulp exposure requiring pulpotomy or pulpectomy.

Informed consent was obtained prior to the study.

The data obtained was tabulated and analyzed using SPSS version 17.

Results:

The study population consisted of 322 children aged between 2 to 7 years. Out of the 322 participants 129 (40.1%) were females and 193(59.9%) males (table 1). 10 (3.1%) were 2 years old, 23 (7.1%) were 3 years old, 36 (11.2%) were 4 years old, 54 (16.8%) were 5 years old, 92(28.6 %) were 6 years old and 107 (33.2%) were 7 years old with the mean age of 5.6 years. (table 2).

Pattern of caries distribution:

The pattern of tooth wise distribution of caries among the study population showed that the most severely affected teeth were the mandibular molars followed by maxillary molars and maxillary incisors. The mandibular incisors were the least affected teeth. (table 3)

The caries pattern between the males and females followed a similar trend with no significant difference seen. (graph 4)

Comparison of inter arch caries pattern was done using the paired t-test. On comparing the upper and lower anterior, in all the age groups more caries were seen on the upper anterior. The mean value in the upper anterior was 1.67 and that in lower anterior was 0.21. This difference was highly significant statistically (P= 0.000) (table 4, graph 5). In the posterior region, the mean value in upper posterior was 1.95 and lower posterior was 2.24. The difference was highly significant statistically (P= 0.000) (table 5, graph 6)

The treatment needs :

Out of the 1955 carious teeth, 1476 (75.49%) fell under Category 2: carious teeth needing restoration including deep caries management, 346(17.69%) were in Category 3: dental treatment consisting of pulpotomy or pulpectomy and only

133 (6.8%) required Category 1 treatment : Extraction. The pattern of treatment needs were similar in all the age groups. (graph 7, table 6)

Table 1. Gender of the patient

Gender	Frequency	Percent
Female	129	40.1
Male	193	59.9
Total	322	100.0

Table 2: Age distribution of the patient

Age in years	Frequency	Percent	Mean age
2	10	3.1	5.60 years.
3	23	7.1	
4	36	11.2	
5	54	16.8	
6	92	28.6	
7	107	33.2	
Total	322	100.0	

Table 3: Pattern of Tooth wise Distribution Of Caries

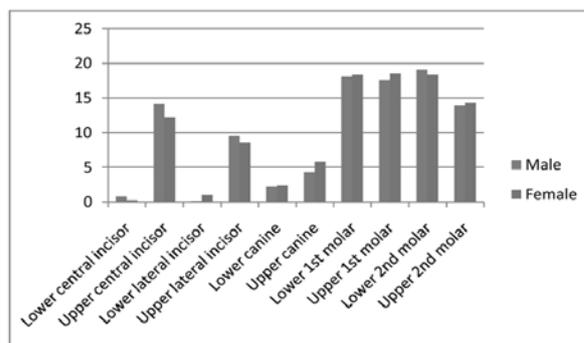
Tooth wise distribution	Maxillary (%)	Mean	Mandibular (%)	Mean
Central incisor	262 (13.4)	.81	12 (0.61)	.04
Lateral incisor	179 (9.15)	.56	10 (0.51)	.03
Canine	96 (4.9)	.30	46 (2.3)	.14
First molar	352 (18)	1.09	355 (18.15)	1.10
Second molar	276 (14.11)	.86	367 (18.77)	1.14

Table 4 : Comparison between upper and lower anterior

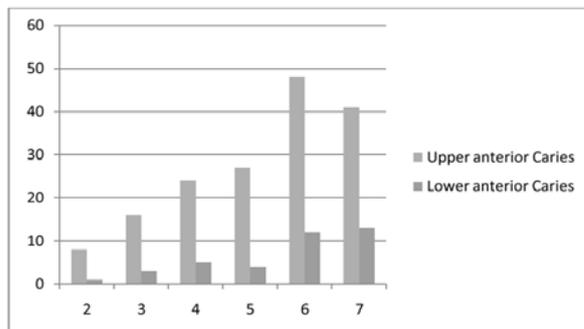
	Mean	Std. Deviation	P value
Upper anteriors	1.67	2.002	.000*
Lower anteriors	.21	.631	

*statistically significant

Graph 4 : Genderwise Pattern Of Distribution Of Caries



Graph 5 : Comparison between upper and lower anterior



Graph 6 : Comparison between upper and lower posterior

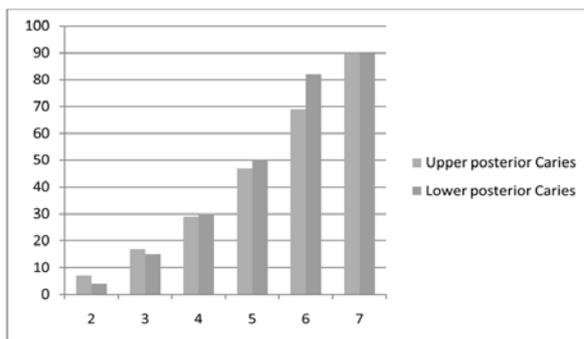


Table 5: Comparison between upper and lower posterior

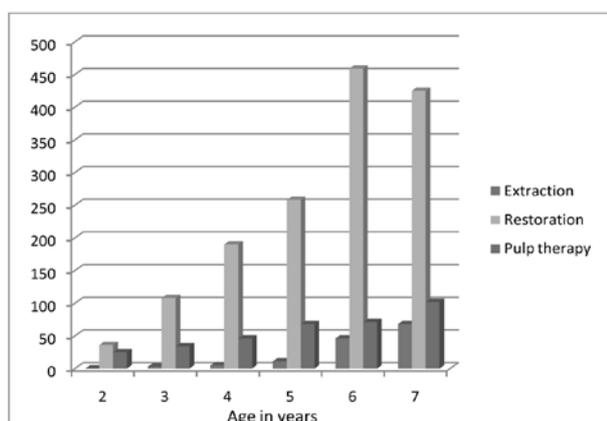
	Mean	Std. Deviation	P value
Upper posterior	1.95	1.359	.000*
Lower posterior	2.24	1.418	

*statistically significant

Table 6: Frequency distribution of treatment needs

Age in years	Category 1 (%)	Category 2 (%)	Category 3 (%)	Total
2	0 (0)	36 (59.01)	25 (40.9)	61 (3.12)
3	3(2.06)	108 (74.48)	34(23.44)	145(7.41)
4	5(2.07)	190 (78.83)	46(19.08)	241(12.32)
5	11 (3.26)	258(76.55)	68 (20.17)	337 (17.23)
6	46(7.98)	459 (79.68)	71 (12.32)	576 (29.46)
7	68(11.42)	425 (71.42)	102(17.14)	595(30.43)
Total	133(6.8)	1476 (75.49)	346 (17.69)	1955 (100)

Graph 7: Distribution of treatment needs



DISCUSSION:

Dental caries in the primary dentition is a major public health problem particularly in developing and underdeveloped countries¹⁰. The present study was conducted in children between the age of 2 to 7 years, with the aim to identify the pattern of caries distribution in the deciduous dentition and also to assess the treatment needs in children with untreated dental caries.

Among the study population no significant difference was seen between the caries pattern in the males and females which was similar to the findings of Agarwal et al¹¹.

Dental caries showed relation to the arches with the upper anterior being more affected than lower anterior and lower posteriors being more affected than the upper posteriors. This difference was significant statistically. The finding was in agreement to various studies^{2, 12,13,14}.

It was evident in the present study that the sequence of caries attack follows a specific

pattern: mandibular molars, maxillary molars and maxillary anterior being predominantly affected by caries while the mandibular incisors were least affected. This is in agreement to various other studies^{2,12,13,14,15,16,17}.

The caries pattern in the present study resembled the nursing caries pattern with mandibular incisors were being least affected. The reason for lower incisors being more resistant to caries maybe due to protection by the tongue and opening of major salivary ducts near the lower incisors^{2, 12,15,16}.

The present study showed that restoration of teeth was the main treatment requirement of the children followed by pulp therapy and extraction. The early caries development seen in these young children reinforces the need for early caries examinations and initiation of prevention programs. Therefore a strict preventive program needs to be implemented in children consisting of prenatal counseling, fluoride supplements, topical fluoride and fluoride varnish applications, dietary counseling, meticulous oral hygiene maintenance and fissure sealants. Special emphasis should be given to routine dental check up.

Conclusion:

It can be concluded from the present study that:

- There was no difference in the caries pattern between the males and females
- Dental caries pattern of tooth wise distribution showed that the most severely affected teeth were the mandibular molars followed by maxillary molars and maxillary incisors. The mandibular incisors were the least affected teeth.
- Dental caries was higher in the maxillary arch when compared to the mandibular arch among the anterior teeth ($P < 0.01$)
- Dental caries was higher in the mandibular arch when compared to the maxillary arch among the posterior teeth ($P < 0.01$)
- The caries pattern in children between 2 to 7 years shows the nursing caries type of pattern with mandibular anterior being the least affected by caries.

- Most of the children required less invasive treatment like restoration (75.49%) as compared to pulp therapy (17.69) and extraction (6.8%).

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