

Prevalence of Severe Early Childhood Caries in Pre-School Children in Bahadurgarh, Haryana, India

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Citation

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Abstract

Objectives: Despite advances in the oral health of children in recent decades, early childhood caries (ECC) continues to pose a serious threat. The purpose of this study was to determine prevalence of severe ECC in children less than five years of age over the duration of two years. **Study participants and methods:** This retrospective study included 709 children attending the department of pediatric dentistry at the PDM Dental College and Research Institute, Bahadurgarh, Haryana between 2008 and 2010. The sample size constituted of 394 boys and 315 girls aged between 1 and 5 years (mean age = $4.31 \pm .91$ years). Severe ECC was determined as per the guidelines of American Academy of Pediatric Dentistry (AAPD). **Statistical Analysis:** Chi-square and ANOVA were used. **Results:** The prevalence S-ECC was 42.03%. The overall mean dmfs was 5.08 ± 5.56 . The statistical analysis highlighted insignificant relation between prevalence of S-ECC with respect to gender and age, though in general, Ip S-ECC (Girls) was higher than Ip S-ECC (boys). With respect to age distribution, higher prevalence of S-ECC was noted in the age group of 3 and 5 years. **Conclusion:** The increase in the percentage of children seeking treatment at the age of 5 years and above indicated less awareness among parents on the subject. Sustained efforts are still needed in order to find more appropriate methods to educate parents regarding the prevention of this caries pattern. Oral health promotion programs should be extended to all health care facilities where children from all socio-economic levels are visiting from infancy on.

INTRODUCTION

Early Childhood Caries (ECC), also referred to as Baby Bottle Tooth Decay is a disease that causes severe and slow decay of teeth [1; 7]. It usually begins with the upper front teeth and then spread to the molars. Factors such as dietary practices, familial socioeconomic background, lack of parental education over dental hygiene and lack of access to adequate dental care attribute to the widespread prevalence of ECC. The condition has long-term growth and development implications.

Severe early childhood caries (S-ECC) is currently defined by American Association of Pediatric Dentistry (AAPD) as “any sign of decay on smooth tooth surfaces in children younger than 3 years of age, or, in children aged 3 to 5 years, carious involvement of one or more smooth surfaces of the upper front teeth”. The AAPD recommends the use of the same term for dmfs > 4 at the age of 3, >5 at the age of 4 and > 6 at the age of 5. In 1998, the National Institute of Dental and Craniofacial Research (NIDCR) proposed S-ECC as the best term to define this caries pattern [3].

Untreated caries may lead to early loss of the primary dentition and affect the growth and maturation of the secondary, adult dentition. In fact, decay in the primary dentition is the best predictor for decay in the secondary dentition; poor dental health and disease often persist to adulthood, affecting speech articulation, growth, and dietary practices (Weinstraub, 1998) [12]. At the most extreme of cases, ECC can also lead to rampant decay, infection, pain, abscesses, chewing problems, malnutrition, gastrointestinal disorders, and low self-esteem (Ramos-Gomez, Weinstraub, Gansky, Hoover, & Featherstone, 2002) [10]. Additionally, children with ECC are shown to have an elevated risk for new lesions as they get older, both in the primary and permanent dentitions (Tinanoff & O’Sullivan, 1997) [11].

Symptoms become obvious when severe complications occur. Sometimes, osteitis can lead to the erosion of the buccal part of the alveolar bone revealing part of the tooth root through the mucosa [8]. Severe early childhood caries occurrence is due to the same factors commonly involved in producing tooth decay: pathogenic oral bacteria (mainly

Streptococcus mutans, transmitted specially by the mother), carbohydrates (from sweet snacks and drinks) and poor quality of dental tissues. The interaction of these 3 pathogenic factors, together with inappropriate childcare and feeding habits (bottle feeding at night, prolonged use of the bottle after 1 year of age etc) lead, in the absence of oral hygiene, to the early onset and rapid evolution of this caries pattern, compared to other patterns that may occur in the temporary dentition. Prevalence of the condition varies widely with several factors (socio-economic, ethnic etc).

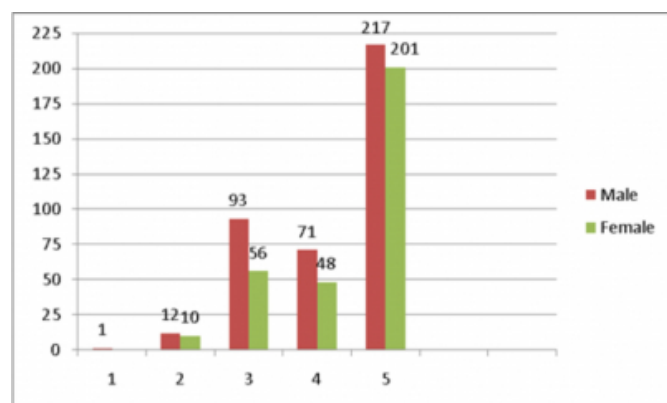
The aim of this study is to gather epidemiological data on S-ECC in children under 6 years of age attending Department of Pediatric Dentistry at PDM dental college Bahadurgarh between March 2008 and February 2010.

MATERIALS AND METHODS

The study was conducted upon a group of 709 children (394 boys, 315 girls) aged between 1 and 5 years (mean age = $4.31 \pm .91$ years) examined and treated in the Department of pediatric dentistry PDM Dental College Bahadurgarh between March 2008 and February 2010. Age and sex distribution of the group are given in Fig. 1.

Figure 1

Fig. 1 - Age and sex distribution of the sample (n = 709 children)



A retrospective study was conducted using the dental records of the patients. Prevalence index values for S-ECC were calculated for the entire group and separately for boys and girls. Age at presentation was recorded.

Data were centralized and processed using Microsoft Office Access Database 2007 and Microsoft Spreadsheet Excel 2007. Mean values were calculated for the studied variables and the statistical significance of differences between mean values was assessed using the t-Student test ($p=0.05$).

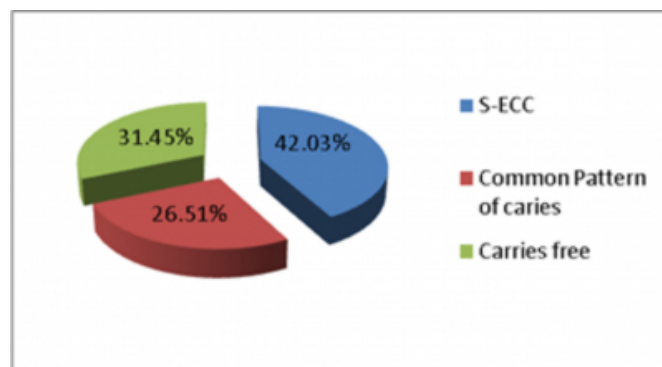
RESULTS

a) S-ECC prevalence

Of the 709 children examined, 223 (31.45%) were caries free, 188 (26.51%) had a common caries pattern and 298 (42.03%) had severe early childhood caries (S-ECC). The prevalence index for severe early childhood caries for the entire study group was 42.03% (Fig. 2).

Figure 2

Fig. 2 – Caries prevalence (n=709 children)

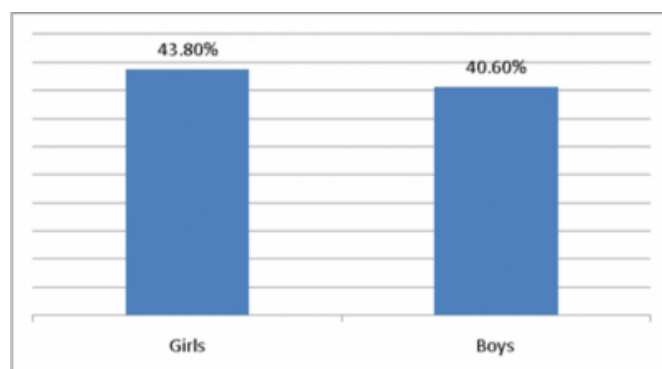


b) Sex distribution of S-ECC

In the study group, 160 of the 394 boys (40.60%) had severe early childhood caries, and 138 of the 315 girls (43.80%) exhibited this pattern of dental decay. This gives a slightly higher prevalence of S-ECC for girls (43.80%) than for boys (40.60%), but differences are not statistically significant ($p = 0.05$) (Fig.3).

Figure 3

Fig. 3 – Sex distribution of I S-ECC



DISCUSSION

In the present study, the prevalence index of severe early childhood caries in a group of 709 children attending the department of pediatric dentistry during 2008-2010 was 42.03% with mean dmfs 5.08 ± 5.56 . The data were analyzed using the chi-square and one-way analysis of

variance procedures. The statistical analysis involving chi-square test highlighted insignificant relation between prevalence of S-ECC with respect to gender and age, though in general, I_p S-ECC (Girls) was higher than I_p S-ECC (boys). With respect to age distribution, higher prevalence of S-ECC was noted in the age group of 3 and 5 years.

Recent data from literature show that in general population, the prevalence of severe early childhood caries ranges between 12% and 36% (Table 1). However, Hallet and O'Rourke (2006) also reported S-ECC prevalence index of 94% for a group of 125 children seeking dental treatment in a paediatric hospital. Regarding sex distribution of this caries pattern, even though girls in the study group had a higher prevalence index than boys (26.30% versus 23.57%), differences were not statistically significant ($p=0.05$).

Studies conducted by Luca et al (2008) also showed similar results with I_p S-ECC for girls (26.30%) than for boys (23.57%) but with statistically insignificant differences.

Figure 4

Table 1: An overview of prevalence data on S-ECC in general population

Authors	Country/City/Year	Sample Size	Age (in yrs)	I_p S-ECC	Comments
Azevedo et al (1)	Brazil, 2005	369	3-6	36%	Severe Early Childhood Caries in Brazilian Preschool Children
Luca et al (6)	Romania, 2008	673	<6	24.81%	Prevalence of S-ECC over a period of 5 years for children below 6 years.
Finlayson TL et al (4)	Detroit, 2007	719	1-5	20%	Low Income African-American children
Postma TC et al (9)	South Africa, 1999-2000	5822	3-6	32%	South African National Children's Oral health Survey
De Grauwe A et al (8)	Belgium, 2004	385	2-3	12.2%	Inner City children
O'Rourke PK (3)	Australia, 2006	125	<4	94%	A paediatric hospital in Brisbane

CONCLUSION

Prevalence index of S-ECC in preschool children attending the Paediatric Dentistry Department during 2008 and 2010 was 42.03%.

The increase in the percentage of children seeking treatment at the age of 5 years and above indicated less awareness

among parents on the subject.

Sustained efforts are still needed in order to find more appropriate methods to educate parents regarding the prevention of this carries pattern.

Oral health promotion programs should be extended to all health care facilities where children from all socio-economic levels are visiting from infancy on.

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