



# Prevalence of early childhood caries among preschool children of low socioeconomic status in district Srinagar, Jammu and Kashmir

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## Abstract

**Introduction:** Dental caries is also one of the major issues which interfere with the healthy life of an individual, especially in children. Due to its high prevalence worldwide, caries in children has often been described as a 'pandemic' disease. In preschool age children, this disease is called Early Childhood Caries (ECC), but is commonly known as "baby bottle tooth decay" or maxillary anterior caries. About 90% of school children worldwide experience dental caries with the disease being most prevalent in Asia and Latin American countries and least prevalent in African countries. This study was undertaken with the aim of assessing prevalence of ECC among preschool children of low socioeconomic status in Srinagar city.

**Material and methods:** A cross-sectional study, approved by the institutional Ethical Committee was designed. Children were selected from various Anganwadi centres in Srinagar city, Jammu and



Kashmir, India. All children 24–59 months old, attending the selected Anganwadi centres, forming a total of 466 were selected. Clinical examination was carried out at Anganwadi centres or concerned schools by a single calibrated examiner. Data was analysed using SPSS version 16.0 software.

**Results:** Out of the 466 children examined, 229 (49.1%) were boys and 237 (50.9%) were girls. The prevalence of ECC was 39.9% (186 out of 466) out of which 102 (54.8%) were boys and 84 (45.2%) were girls. Whereas prevalence of ECC was significantly higher among 36–47 months old children as compared with other groups ( $\chi^2 = 14.03$ ,  $P = 0.001$ ). The overall mean deft for ECC was  $1.80 \pm 3.18$  ranging from 0 to 17 teeth. Mean deft was significantly higher in 36–47 months age group as compared with others ( $F = 10.89$ ,  $P = 0.000$ ).

**Conclusion:** There is an urgent need to implement Preventive and Curative Oral Health Programs for children. As Anganwadis are run by State Government, a public–private partnership between the government, Private Dental Colleges, and Non-Government Organizations (NGOs) would prove useful toward providing oral health care to these children.

### Key words

Dental caries, Early childhood caries, Preschool children, Jammu and Kashmir.

### Introduction

Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity. Dental caries is also one of the major issues which interfere with the healthy life of an individual, especially in children. Globally, issues of oral health in children revolve predominantly around dental caries. Due to its high prevalence worldwide, caries in children has often been described as a ‘pandemic’ disease characterised by a high proportion of untreated carious cavities causing pain, distress and functional restrictions. In addition, these untreated carious lesions have a considerable impact on the general health of children, which influences the social and economic well-being of communities. It has been observed that untreated caries among children is more widespread in developing than in developed countries [1].

Dental caries among children remain a serious problem. In preschool age children, this disease is called Early Childhood Caries (ECC), but is commonly known as “baby bottle tooth decay” or maxillary anterior caries. As defined by the

American Academy of Pediatric Dentistry (AAPD), ECC is the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces (dmfs) in any primary tooth in a preschool-age child between birth and 71 months of age [2]. Dental caries is the most prevalent oral disease among children in the global scenario [3]. About 90% of school children worldwide experience dental caries with the disease being most prevalent in Asia and Latin American countries and least prevalent in African countries. In the United States, dental caries is the most common chronic childhood disease and it is at least 5 times more common than asthma [3]. In India according to national oral health survey and fluoride mapping (2003), the prevalence of dental caries among 5 year age group was 51.9% [4].

There is a lack of definite data on prevalence of ECC both at national and local levels in the state of Jammu and Kashmir. Hence, this study was undertaken with the aim of assessing prevalence of ECC among preschool children of low socioeconomic status in Srinagar city.



## Material and methods

A cross-sectional study was designed among preschool children belonging to low socioeconomic status in Srinagar city, Jammu and Kashmir, India. The study was approved by the institutional Ethical Committee. Children were selected from various Anganwadi centres in Srinagar city, Jammu and Kashmir, India. Permission and list of Anganwadis was obtained from the Director, Department of social welfare, Srinagar. From that list, 18 Anganwadis were selected via cluster sampling, covering the whole of Srinagar city. All children 24–59 months old, attending the selected Anganwadi centres, forming a total of 466 were selected. Informed consent was obtained from parents and Principals/Headmasters prior to the beginning of the study. Children absent on the day of examination and those suffering from systemic disease were excluded from the study. Clinical examination was carried out at Anganwadi centres or concerned schools by a single calibrated examiner using mouth mirror and explorer under natural light, on an ordinary chair. Kappa value for single examiner was 0.78. Caries experience was recorded using deft index (Greubbell, 1944) [5]. Caries of all the three-enamel, dentin, and pulp were included. Data was analysed using SPSS version 16.0 software. Chi-square, t test, and ANOVA were used to find significant age and gender wise differences. P value < 0.05 was considered as statistically significant.

## Results

Out of the 466 children examined, 229 (49.1%) were boys and 237 (50.9%) were girls; 280 (60.1%) were between 24 and 35 months, 172 (36.8%) were between 36 and 47 months and 14 (3.0%) were between 48 and 59 months of age. The prevalence of ECC was 39.9% (186 out of 466). Age and gender wise prevalence of ECC was as per **Table - 1**.

Out of 186 (100%) with ECC, 102 (54.8%) were boys and 84 (45.2%) were girls. No significant gender differences were observed in percentage of ECC ( $\chi^2 = 1.085$ ,  $P = 0.29$ ). Whereas prevalence of ECC was significantly higher among 36–47 months old children as compared with other groups ( $\chi^2 = 14.03$ ,  $P = 0.001$ ).

Out of 186 with ECC, 172 (92.5%) had s-ECC, including 96 (55.8%) boys and 76 (44.2%) girls. Age and gender wise prevalence of s-ECC was as per **Table - 2**. No significant gender difference was found. In percentage of s-ECC ( $\chi^2 = 0.55$ ,  $P = 0.557$ ). But prevalence of s-ECC was significantly higher among 24–35 months old children as compared with other groups ( $\chi^2 = 26.44$ ,  $P = 0.000$ ).

Mean caries experience of ECC and s-ECC cases was as per **Table - 3**. The overall mean deft for ECC was  $1.80 \pm 3.18$  ranging from 0 to 17 teeth. t Test showed no significant differences in mean caries experience of boys and girls ( $P = 0.840$ ). But mean deft was significantly higher in 36–47 months age group as compared with others ( $F = 10.89$ ,  $P = 0.000$ ). Mean deft for s-ECC was significantly higher in 36–47 months age group as compared with others ( $F = 4.04$ ,  $P = 0.019$ ).

## Discussion

A total of 466, 24–59 months old children were examined for presence of ECC from 18 Anganwadi centres and in Srinagar city. Anganwadis are government run day care centres, which cater to the needs of children from 0 to 6 years of age of low socioeconomic status. Anganwadis function from 10 am to 2 pm on all days and provide free food and informal education to these children. Hence, most of the children of preschool age belonging to low socioeconomic status attend Anganwadis. As many studies have shown a high ECC prevalence in low income groups [6], Anganwadis were

**Table - 1:** Age and gender wise prevalence of ECC.

	Age in months									Total
	24-35			36-47			48-59			
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
<b>N</b>	128	152	280	90	82	172	11	3	14	466
<b>ECC (N)</b>	54	39	93	45	42	87	3	3	6	186
<b>ECC (N%)</b>	42.2	25.7	33.2	50	51.2	50.6	27.3	100	42.9	39.9

**Table - 2:** Age and gender wise prevalence of s-ECC.

	Age in months									Total
	24-35			36-47			48-59			
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
<b>N</b>	54	39	93	45	42	87	3	3	6	186
<b>s-ECC (N)</b>	54	36	90	41	38	79	1	2	3	172
<b>s-ECC (N%)</b>	100	92.3	96.8	91.1	90.5	90.8	33.3	66.7	50	92.5

**Table - 3:** Mean deft of ECC and s-ECC cases.

Mean deft	Age in months		
	24-35	36-47	48-59
<b>ECC</b>	1.26 ± 2.50	2.31 ± 3.95	1.74 ± 3.38
<b>s-ECC</b>	4.02 ± 2.54	5.28 ± 4.13	4.15 ± 3.92

chosen for the study. A cluster sample was taken to cover the whole of Srinagar city. Socioeconomic status was recorded from Anganwadi registers. More than 70% of the parents were illiterates and worked as labourers and their per capita income ranged from Rs 1000–2000 per month.

The prevalence of ECC in the present study was 39.9%. This is comparatively high compared with that in other places in India as per some Indian studies [7, 8]. Studies in Udipi and Davangere showed a prevalence of 19.4% and 19.2%, respectively [7, 8]. However, a study in Kerala showed caries prevalence of 44% among 8–48 months old children [9]. The prevalence of ECC worldwide is highly variable ranging from 2.1%

in Sweden to 85.5% in rural Chinese children according to a systematic review of Ismail and Sohn [10]. While the prevalence in USA is reported to be 11–53.1%, the prevalence in UK is 6.8–12% [11]. This could be attributed to differences in case definitions and diagnostic criteria of ECC apart from risk factors.

An important finding of this study was that about 92.5% of children with ECC showed s-ECC and all the deft was due to untreated caries. There was not a single filled tooth and all the children required treatment. This is indicative of a total lack of awareness about oral health among parents, lack of accessibility, and affordability for oral health care in this section of people which is quite alarming.



The present study showed a significant increase in the prevalence of ECC with increasing age ranging from 33.2% among 24–35 months old to 50.6% and 42.9% among 36–47 and 48–59 months old children, respectively. Some caries prevalence studies in Brazil, South Africa, and others have showed a similar pattern [12]. However, s-ECC was more prevalent in 24–35 months age group.

The mean deft for s-ECC cases was also significantly higher in 36–47 months age group with a mean caries experience of  $5.28 \pm 4.13$ . This is higher than the mean caries experience of children with s-ECC in Haryana (dmfs =  $5.08 \pm 5.56$ ) as reported by a study [13]. Many studies have shown a higher prevalence of ECC among girls than boys, which has not been significant [12, 13]. The present study showed a higher prevalence among boys than girls, which did not reach significance.

In the present study, there could be a slight underestimation of caries experience. As the study was carried out at Anganwadis with minimum instruments and light, few of the initial lesions may have been missed, especially on the proximal surfaces of the posteriors and also because of limited mouth opening experienced with very young children, especially those between 2 and 3 years of age.

### Conclusion

There is an urgent need to implement Preventive and Curative Oral Health Programs for children. As Anganwadis are run by State Government, a public–private partnership between the government, Private Dental Colleges, and Non-Government Organizations (NGOs) would prove useful toward providing oral health care to these children.

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