

# Early Childhood Caries & Feeding Practices in Children aged 3 Yrs. Attending Anganwadi Centers of Bangalore South

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## Abstract

**Background and Objectives:** Preschool oral health is an overlooked aspect of childhood health and well being, especially Early Childhood Caries. It is an infectious and multifactorial disease of the Childhood. Several factors play a role in the etiology of disease. The objectives of the present study was to

1) To determine prevalence of Early Childhood Caries in children aged 3 years attending the Anganwadi Centers of Bangalore South

2) To correlate the Early Childhood Caries in children aged 3 years with feeding practices.

**Methodology:** A Cross-sectional study was conducted in children aged 3 years attending Anganwadi centres of Bangalore South. Required and relevant information regarding feeding practices were obtained from parents. Dentition Status and Treatment Need (WHO 1997) was used to record caries. ANOVA and f-test was used for statistical analysis.

**Results:** The prevalence of ECC was 31.4% with mean dmft of study population is 1.15±2.28 with the males having an average dmft of 1.31±2.48 and females having an average dmft of 1.01±2.07. The risk factors for caries in this study population were found to be the habit of bottle feeding in the night with a p value of <0.001, children who consumed more in between meal snacks had a higher ECC prevalence with a p value of <0.001.

**Conclusions:** The present study provides an insight regarding the caries prevalence in children aged 3 years. This study indicates high caries levels in children with bottle feeding at night and snacking frequency of more than 3 times in a day.

**Key Words:** Early Childhood Caries, Bottle feeding, Snacking frequency

## Introduction

Despite great achievements in oral

health, even with dramatic advances in the armamentarium for fighting oral diseases, such as dental caries and periodontal disease, these conditions remain prevalent in many parts of the world without regard for geopolitical boundaries. Early Childhood Caries (ECC), also known as early childhood tooth decay is particularly destructive form of tooth decay that afflicts young children. It is the most common disease of the childhood although it is not life threatening, it may contribute to suboptimal health and failure to thrive<sup>1</sup>. It is a unique form of rampant caries that develops in the primary dentition at a very young age<sup>2</sup>. ECC can manifest itself in severe pain, infection, abscesses, chewing difficulty, malnutrition, and gastro intestinal disorders. Further decay of primary teeth can affect child's growth, leading to malocclusion by adversely affecting the eruption of the permanent dentition, and cause poor speech articulation and low self esteem<sup>3</sup>.

The older terms nursing caries, "baby bottle tooth decay", nursing bottle syndrome, maxillary anterior caries lesions, rampant caries lesions and most recently has been largely replaced with the broader and umbrella term ECC. This change in terminology has helped to focus attention on risk factors other than prolonged breast feeding and bottle feeding<sup>1,3,4</sup>. It is a serious socio-behavioural and dental problem that afflicts infants and toddlers. American Academy of Pediatric Dentistry (AAPD) in 2003 defined ECC as the presence of one or more decayed, missing (due to caries), or filled tooth surfaces in any primary tooth in a child 6 years of age or younger<sup>1,4,5,6</sup>. Bangalore being a metropolitan city has children from different socio-economic and cultural backgrounds. Despite the seriousness of Early Childhood Caries problems, there has been a paucity of prevalence studies in Bangalore, which may be due to the difficulty of access to this age group. Hence an attempt is made to assess the prevalence of Early Childhood Caries and its association with

feeding practices in children attending Anganwadi centres of Bangalore South.

## Materials And Methods

A prevalence study was conducted to assess Early Childhood Caries in children aged 3 years attending Anganwadi Centers of Bangalore South and to associate the presence of ECC with feeding practices. The Bangalore South zone consists of 109 Anganwadi Centers in the rural areas with a population of around 1897 children who formed the study population.

Permission, required and relevant information regarding the study centres was obtained from the Child Development Project Officer. A survey was systematically scheduled to spread over a period of 3 months. Examination criteria employed was Dentition status and Treatment needs proposed by WHO (1997) in Basic Oral Health Survey Methods, 4<sup>th</sup> edition. Before the start of the survey, the investigator was calibrated at Department of Community Dentistry, The Oxford Dental College and Hospital under the guidance of the Professor in order to limit the examiner variability. The Kappa co-efficient value for intra-examiner reliability with respect to Dentition status and Treatment needs was 0.8. A specially designed and pretested proforma was used for recording the data which included questions regarding child's feeding habits. A recording assistant who was trained to assist the recording procedure helped the investigator in recording the findings. A pilot study was carried out on 10% (190) of the study population to check the feasibility and to have prior idea regarding the estimate of the time taken to examine each patient and the survey was planned accordingly. Voluntary written informed consent was obtained from parents of the children participating in the study before the clinical examination. Questionnaires were distributed to the parents and were explained to the parents in case they do not understand, the same was recorded by the examiner or the care takers.

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Examination was carried out by making the child sit on ordinary chair with back rest, with the examiner standing behind the chair. Survey findings were reported to the concerned care takers of these centres and were referred to The Oxford Dental College and Hospital for further treatment. The data obtained was compiled systematically and statistical analysis has been carried out.

**Results**

The study population comprised of 1897 children, out of whom 901 (47%) were males and 996 (53%) were females (Table 1). Among the study population 33.8% of the males and 29.1% of the females had caries with mandibular first molars being most affected (10.7%), followed by maxillary central incisors (7.79%) and least affected were mandibular lateral incisors (0.06%). Caries was significantly seen in children who were bottle fed only (0.96) than children who were breast fed only (0.88). Children who were bottle fed at night had higher caries prevalence with mean dmft of 1.00 compared to the children who were not bottle fed at night with a mean dmft of 0.88. Children who consumed snacks and sticky type of food had higher caries prevalence with a mean dmft of 1.39. Children who frequently (more than once) consumed snacks in between meals reported a mean dmft of 0.91.

The results after considering independent variables simultaneously, the risk factors for caries in children was the habit of bottle feeding in the night and children who consumed snacks in between meals had a higher ECC prevalence with a p value of <0.001.

**Discussion**

This investigation considered the prevalence of caries in 1897, 3 year children attending Anganwadi centres of Bangalore South.

**Prevalence of Early Childhood Caries (n=1897)**

This study documents the prevalence rate of 31.4%. The finding was similar in studies by Bian and champion of china who reported a ECC prevalence of 36% and Gomez et al 30.5%. Caries prevalence (31.4%) was slightly lower in this population with a mean dmft of 1.15±2.28. It was slightly lower compared to the studies by Dr Rajath Bhargave who reported a ECC prevalence of 58%, Horowitz et al who reported a prevalence of 56.5% with a mean dmft of 1.93. Brothwell et al reported a prevalence of 40.7% with a mean dmft of 2.0±3.3. The caries prevalence rate in this study among the 3 year old children was 28.1% is lesser than that report from Northern Philippines 85%; Japan 60%; and Thailand was 62%.

The prevalence of caries and the mean dmft was slightly high among boys compared to the girls with a mean dmft of 1.31±2.48 and 1.01±2.07 respectively. This was similar in the study by Anegundi R and Carino KMG, Shinada K and Kawaguchi Y<sup>10</sup>. This may be due to apparent sex difference in eruption

times of teeth and to the length of exposure of the teeth to the oral environment<sup>11</sup>.

**Child rearing practices and ECC**

The influence of infant feeding per se on ECC remains a complex and some what a controversial issue. Under the normal conditions, milk is not considered to be a cariogenic agent, but repeated and prolonged exposure leads to larger decrease in plaque PH<sup>14</sup>. The lactose content of both human and bovine milk can be cariogenic if the milk is allowed to stagnate on the teeth. In this study, majority of the children had been exclusively breast fed for more than a year. Data from the developing countries also suggest that breast feeding is protective of caries development till 12 months. Breast feeding duration beyond 12 months has been implicated in ECC development and this effect could be due to gradual depletion of the protective elements in human breast milk after prolonged lactation. In this study the association between children who were bottle fed at night and the prevalence of dental caries was statistically significant (p<0.001). This was similar to the results quoted by Hallet and Rourke<sup>5,15</sup>, Dini et al and Weinstein and Foeres<sup>15</sup> who said bottle feeding increased the risk of ECC development. In this study children who were bottle fed only had more caries than children who were breast fed only. This was similar to the results by Bian and Champion of china, Oulis et al<sup>16</sup>, winstein et al, winter et al<sup>17</sup>, Grandefjord et al, creedon and Mullane (2001), Holland et al(1988) Tee<sup>17</sup>, Horowitz et al who observed that children who fall asleep with the nursing bottle have a significantly greater chance of developing caries than children discarding the bottle, before they fall asleep. However any relationship between breast feeding and dental caries is very difficult to establish conclusively since it may be masked by the influence of other factors such as socioeconomic status of the family and parental education, or factors like enamel hypoplasia, streptococcus mutans infection, diet, medical conditions in infancy. The average age at which the children started solid food consumption was 1.33 years. Children who started having semisolid food at an age 1 year or lesser and 1+ years reported caries in 30.1% and 35.4% respectively. This was similarly reported by Hallet and Rourke<sup>15</sup>. Children who started drinking with cup 1 year or lesser and 1+ years reported caries with 39.2% and 41.3% respectively. This was similarly reported by Hallet and Rourke<sup>14</sup>. Early introduction of solids may help to encourage more even mixing of saliva with food, prevent stasis of cariogenic liquids around the teeth and reduce caries risk.

**Child Dietary Habits and ECC**

In the present study, most of the children had the habit of sticky food consumption. In this study children with a frequency of snacking between meals more than twice or more had a higher caries prevalence with a

mean dmft of 0.8 than children who did not have a habit of snacking in between meals which is supported by a study in Washington state by Tsuobochi J et al, Creedon and Mullane who reported a mean dmft of 3.1<sup>17</sup>. The children who had a habit of snacking in between meals for more than 3 times a day than children who snacked once a day or lesser suggests a positive association between the occurrence of caries and frequency of snacking between meals. This was also supported by study done by Sillanpaa et al, Babu Jose of Kerala, Steel et al and Horowitz et al who reported caries in 87.9% of the children who consumed in between meal snacks<sup>15</sup>. The relationship between meal snacking and caries status in this study showed statistically significant association (p<0.001). This was supported by Hyoungh B et al, Rugg Gunn 1983, Bowly and Birkhe, 1986. The frequency with which sugary foods are consumed is usually considered of greater etiological importance than the total amount of sugar. Several studies in children have found a relationship with a reported frequency of eating sugary foods. These findings do substantiate often considered a single factor which had profound influence on the occurrence of caries.

**Recommendations**

1. Mother should be encouraged to breast feed the baby for the first year and then to go directly to cup or spoon feeding rather than starting bottle habits.
2. After the eruption of the first tooth the baby should not be fed while sleeping.
3. After every feed the child should be given a sip of water to clear residual milk from the mouth and hold the child upright thereafter for five to ten minutes.

**Table 1: Distribution of The Study Population Based on Age And Gender of The Children.**

Total	Male	Female
1897	901 (47%)	996 (53%)

**Table 2: Distribution of The Study Population Based on Type of Feeding. (n=1897)**

Type of Feeding	Number	%age
Breast Fed only	1504	79.2%
Bottle Fed onmly	37	2.0%

**Table 3: Distribution of The Study Population Based on The Duration And Frequency Of Breast Feeding.**

Duration of Breast Feeding	Number (1860)	%age
Not breast fed	37	1.98%
<6 months	52	2.8%
6 months-1 yr.	523	28.1%
> 1 yr.	1248	67.12%

**Table 4: Distribution of The Study Population Based on the Content of Bottle Feed**

Content of Bottle feed	Number (393)	%age
Milk	256	65.1%
Milk powder & milk	112	28.4%
Others	18	6.5%

