

# Prevalence of Early Childhood Caries among children visiting Department of Dental Surgery, Chengalpattu Medical College and Hospital

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## **ABSTRACT**

***Aim:*** *The purpose of this study; was to know the prevalence of Early Childhood Caries (ECC) in children reporting to the Department of Dental Surgery – Chengalpattu Medical College and Hospital (CMC), Chengalpattu district, Tamil Nadu.*

***Methods:*** *This is a retrospective study of data in the Dental surgery department, CMC from January 01, 2018 to January 31,2020. The study included all Pediatric patients who visited the Dental surgery department, CMC during the study period.*

***Results:*** *The prevalence of ECC was 51.7%. The prevalence of ECC increased with the increasing age with the highest prevalence among 5-6 year (69.2%) followed by 57.9%, 48.9%, 46.2%, 32.1% and 0% among 4-5, 3-4, 2-3, 2-1 and less than one year old, respectively*

***Conclusion: From the present study it was concluded that the prevalence of ECC was high in children visiting the Department of Dental Surgery, CMC, Chengalpattu District. Therefore, there is a need for caries preventive and treatment programs for this section of children.***

***Keywords: Early Childhood Caries, Dental caries, Pediatric patients***

## **INTRODUCTION**

Early childhood caries (ECC) is defined as the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of 6 years.<sup>1</sup> Early childhood caries (ECC) remains a major public health problem in infants and preschool children, especially in developing countries like India, because of its early onset and high prevalence, as well as the high likelihood of non-treatment.<sup>2-4</sup> In infants and young children, there are numerous unique risk factors of ECC. One of these factors is their feeding practices and it plays a major role in the development of ECC because teeth are more vulnerable to caries immediately after the eruption.<sup>5</sup>

ECC is a multi-factorial disease. The factors include a susceptible host, fermentable carbohydrate diet, presence of dental plaque, high number of cariogenic micro-organisms such as Mutans streptococci, lactobacillus and time.<sup>6</sup> ECC has been associated with demographic characteristics, oral hygiene practices, parental attitudes, educational status of the mother, socio-economic status, temperament of the child, mouth breathing habit, siblings, pacifiers dipped in honey, children with chronic illness or special health care needs and other feeding habits, maternal nutrition, psychosocial issues, frequent use of medications and parenting practice.<sup>7-13</sup>

The prevalence of ECC and its association with feeding habits and oral hygiene practices in preschool children of Kerala state which is a neighboring state of Tamilnadu was evaluated by Jose and King. They showed a caries prevalence of 44%. They also concluded that the preschool children in Kerala, who were at high risk of developing caries lesions were those children with poor oral hygiene, who consumed snacks, who were given snacks as a reward, and those who belonged to lower socioeconomic status.<sup>14</sup> However, because most studies on ECC have been conducted among specific ethnic, immigrant and lower socioeconomic communities, extrapolation of current risk assessment models to the general population is problematic.<sup>15</sup>

Hence, knowledge of the prevalence of ECC is necessary to develop targeted interventions for the prevention of subsequent tooth decay, and to decrease the number of children that require emergency treatment. So, this study aimed to determine the prevalence of ECC in children visiting aged between 8 months and 6 years in the Dental surgery department, Chengalpattu medical college.

## **MATERIALS AND METHODS**

A retrospective analysis was done on the case records of patients treated in the Dental surgery department – CMC, from January 01, 2018, to January 31, 2020.

A total of 650 pediatric patient's records (Children aged between 8 months and 6 years) was analyzed for ECC in the study period retrospectively. The data were collected by trained personnel's and the privacy of the patient's data was maintained by the investigators. The presence or absence of ECC was recorded. Data were collected and spread on an excel sheet and subjected to statistical analysis.

## Results

A total of 650 children aged between 8 months and 6 years were analyzed, among them, 47.7% were boys and 52.3% girls. The prevalence of ECC was 51.7% [Table 1]. The prevalence of ECC increased with the increasing age with the highest prevalence among 5-6 years (69.2%) followed by 57.9%, 48.9%, 46.2%, 32.1% and 0% among 4-5, 3-4, 2-3, 2-1 and less than one year old, respectively [Graph 1&2].

## Discussion

The oral health of children is usually an overlooked aspect of childhood health and well-being, especially in cases of ECC. These children under six years of age constitute a population vulnerable to caries because of their dependence on their parents. ECC is a serious public health problem in children, and although it is not life-threatening, if left untreated it may lead to pain, bacteremia, compromised chewing ability due to furcal/periapical infection, and toxic overdose of analgesics (acetaminophen) administered during the early stages, followed by malocclusion in permanent dentition, phonetic problems, suboptimal health, lower self-esteem, and failure to thrive.<sup>16,17</sup>

In the present study, the prevalence of ECC was 51.97%. The prevalence was low compared to the study conducted by Dixit et al.<sup>18</sup> showed the prevalence of ECC to be 71.1% in Narmada district, Gujarat,<sup>18</sup> But similar findings were seen in some studies in India where the prevalence of ECC was observed to be 62.14% (Mudhol town, Karnataka),<sup>19</sup> 64.2% (Udupi Taluk, Karnataka).<sup>20</sup> but few studies in India from varied population reported lesser prevalence - 37.3% (Bengaluru, Karnataka),<sup>21</sup> 39.9% (Srinagar, Jammu and Kashmir),<sup>22</sup> 27.5% (Bengaluru urban, Karnataka),<sup>23</sup> 32% (Rohtak, Haryana),<sup>24</sup> and 42.03% (Bahadurgarh, Haryana).<sup>25</sup> The low prevalence observed in this study could be due to the increased use of fluoridated toothpaste available in the market, increased oral hygiene awareness as there are many oral health education programs organized by well-established dental institutions in nearby areas as most of the studies are conducted in and around the cities near dental college institutes.

The prevalence of ECC among children aged between 8 months and 6 years varies between continents and countries. The higher prevalence of ECC among the preschool-age group might be attributed to lack of oral hygiene, poor awareness about oral hygiene procedures, and negligence on the part of parents and caretakers and lack of dexterity in these children below 6 years of age. Besides, the populations considered in this study were the children visiting the government institute, who are mostly from a low socioeconomic background. The parents of this population usually spend maximum time and energy to earn a living and oral hygiene gains less important, which may be another reason for the high prevalence of ECC in this population.

The present study illustrated that prevalence of ECC increases significantly with increasing age [Graph 2]. A similar trend was observed in some previous studies by Prakash et al.<sup>23</sup> and Stephen et al.<sup>26</sup> This increase in prevalence with age was most likely because as the age increases, the cariogenic challenge also increases and there is a change in the dietary habits and hygiene practices.<sup>15</sup> There is an increasing number of erupted primary teeth that become exposed prolonged in the oral cavity also suggests a relationship between the increase in the ECC with age.

Data obtained in this retrospective study may serve as a baseline for planning and evaluation of community development and oral health education programs. The ultimate challenge will be sustained long-term behavioral change among parents since children below six years completely depend on their parents. The burden of dental decay in this population reveals the immediate need for effective implementation of treatment and preventive measures. The government hospital is the one that serves people of low socioeconomic status on large scale. To prevent ECC in children, high-risk individuals must be identified at an early age (preferably high-risk mothers during pregnancy) and oral health

counseling should be given. To give prenatal counseling the dentist/ allied health care professionals should work arm in arm with gynecologists, pregnancy scanning specialist, Nurses, Auxiliary Nurse Midwife (ANM), Accredited Social Health Activists (ASHAs), and all other health care professionals. Thus, both medical providers and those working with pregnant women and the very young must play an integral role in the prevention and early detection of ECC. Ultimately, community-based solutions should be explored which can be used to strengthen if used in conjunction with the existing and emerging strategies for promoting early childhood oral health and preventing ECC.

This study has some limitations, particularly its retrospective study, which did not allow for the investigation of a cause-effect relationship. Data regarding risk factors for ECC such as the history of breastfeeding, dietary habits, oral hygiene practices, and social determinants such as family income, number of siblings, occupation of the parents and so on which could have influenced ECC was not recorded. Further studies taking all these factors into account are recommended.

## CONCLUSION

The findings of this retrospective study will form part of a baseline for the oral health assessment for children below 6 years of age in Chengalpattu district, Tamilnadu. From the results of this study, it can be concluded that caries prevalence comparatively high in children of Chengalpattu district. There is evidence that suggests children with this condition remain at high risk for future caries attack. Therefore, there is a need for caries preventive and treatment programs for this section of children.

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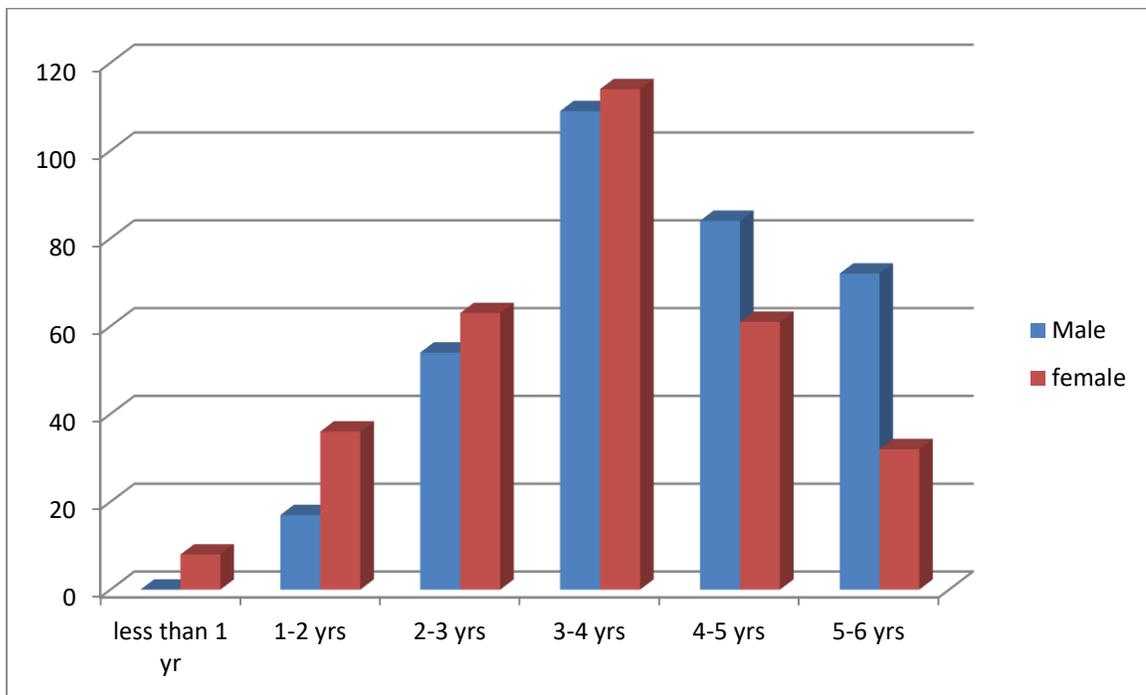
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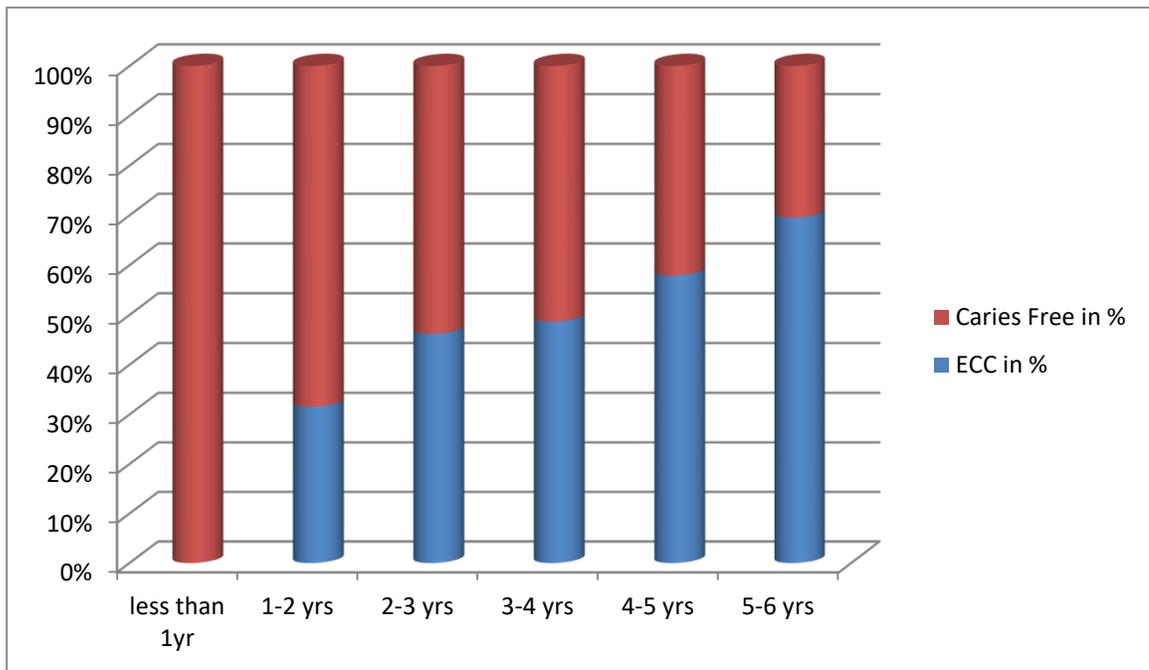
Age group	Gender	Caries (ECC)	Caries free
8 months – 1 year	Male	0 (0%)	3 (100%)
	Female	0 (0%)	5 (100%)
	Total	0 (0%)	8 (100%)
1-2 years	Male	7 (30.4%)	16 (69.6%)

	Female	10 (33.3%)	20 (66.7%)
	Total	17 (32.1%)	36 (67.9%)
2-3 years	Male	23 (43.4%)	30 (56.6%)
	Female	31(48.4%)	33(51.6%)
	Total	54(46.2%)	63 (53.8%)
3-4 years	Male	47 (46.5%)	54 (53.5%)
	Female	62 (50.8%)	60 (49.2%)
	Total	109 (48.9%)	114 (51.1%)
4-5 years	Male	45 (64.3%)	25 (35.7%)
	Female	39 (52%)	36 (48%)
	Total	84 (57.9%)	61 (42.1%)
5-6 years	Male	37 (61.7%)	23 (38.3%)
	Female	35 (79.5%)	9 (20.5%)
	Total	72 (69.2%)	32 (30.8%)
Total	Male	159 (51.3%)	151 (48.7%)
	Female	177 (52.1%)	163 (47.9%)
	Total	336 (51.7%)	314 (48.3%)

Table 1: Caries prevalence among study population



Graph 1: Prevalence of ECC in relation to age and gender.



Graph 2: Proportion of children (in %) with and without ECC in relation to age