Original Research Article

Prevalence of Early Childhood Caries in Thiruvallur District: A cross sectional hospital based study

Abstract

Oral health is an essential and important component that is involved in the total health and well-being of an individual. It affects various aspects of a person's health status such as the quality of life including self-esteem, ability to masticate, speak and various other levels of routine activities. Among the oral diseases that are available in the literature , the incidence of dental caries is the most common disease of humankind.It affects people irrespective of their Gender, socioeconomic status, race and age

Keywords: Early childhood caries, thiruvalluvar district, children, epidemiology study

Introduction:

Oral health is an essential and important component that is involved in total health and well-being of an individual. It affects various aspects of a person's health status such as the quality of life including self-esteem, ability to masticate, speak and various other levels of routine activities.[1] Among the oral diseases that are available in the literature , the incidence of dental caries is the most common disease of humankind.[2],It affects people irrespective of their Gender, socioeconomic status, race and age[3]

Early childhood caries commonly abbreviated as ECC in spite of the availability of various methods of prevention and treatment modalities is one of the prevalent disease of dental origin in children. The same is present in most socially disadvantaged communities [4]. 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 preschool-age child between birth and 71 months of age." According to AAPD[5] The disease progression maybe chronic in nature in most of the young children in which the lesion may begin as a white spot lesion in the maxillary central incisors at the level of the margin of the Gingiva[6]. If the disease in not diagnosed and treated promptly it may lead to various consequences such as pain, discomfort during

mastication, malocclusion, difficulty in speech, poor systemic and oral health, and lowered self-confidence.[7] Although the disease is not life threatening, ECC is one of the major dental public health problems that affects infants and preschool children which creates social, behavioral, medical, psychological, economical, and dental complications affecting quality of life of preschool children and imposing financial burden on their families.[8]

In young growing children, there are a number of unique risk factors which may lead to the formation of ECC. One of these factors which is predominantly the cause is their feeding practices and it plays a significant role in the development of ECC because teeth are more prone to dental caries immediately after eruption into the oral cavity .[9] Biology of the oral cavity can be altered by several factors unique to young children such as the immaturity of the defense system, the varying behavioral patterns with feeding.The severity of the problems appear to vary with cultural, genetic, and socioeconomic differences within a community based on litreature. In general communities such as marginal farmers, laborers, agricultural laborers, and those living below poverty line send their children to work as Anganwadis.[10] These children predominantly belonging to lower level of the socioeconomic status, along with poor feeding conditions and dietary patterns. The parents of these children lack health awareness and have limited utilization of health facilities.[11] As an effect they end up developing early childhood caries. Thiruvallur district is primarily a rural area and hence the prevalence needs to be assessed. The aim of the study is to estimate the prevalence of early childhood caries in Thiruvallur district.

Materials and Methods:

The present study was carried around from June 2019 to December 2019 in Saveetha Dental College, located in Thiruvallur District, TamilNadu,India. Ethical consent was obtained from the institutional committee and informed consent was obtained from the guardian of all the patients that were taken as part of the study. A total sample size of 181 patients were included as part of the study which consisted of both male and female participants.

The inclusion criteria for the study was that the child should be within the age group of 3-6 years of age, should be from Thiruvallur district, should be mentally sound. The exclusion criteria included children with any major disability, children with ongoing dental treatment and children with any other debilitating diseases. A randomised sampling method was followed for the particular study.Calibration between investigator and guide was done prior to the study to ensure that there was no bias involved in the study. The diagnosis of ECC was based on the AAPD definition. Diagnosis was done through clinical examination with the use of mouth mirror and a straight probe. Examination was carried out in the presence of broad daylight or any artificial light source such as dental chair light if required. Sterile gauze pads and three way syringe were utilised to clean and dry the teeth surfaces before examination.

Results:

A total of 181 children were studied as part of the present study of 3-6 years of age out of which 92 (50.8%) candidates were males and 89 (49.2%) candidates were females. In the age groups of 3-4 years, 4-5 years and 5-6 years the number of candidates that were examined were 70 (38.6%), 54 (29.8%) and 57 (31.4%) respectively.

Out of the total study population of 181 candidates, 73 (40.3%) candidates had early childhood caries, out of which 42 (23.2%) were males and 31 (17.1%) were females. (Table 1)

Total Population= 181	
Males	Females
92	89
50.80%	49.20%

(Table 1 : Total Population)

From Table 2 it is evident that 31 (17.1%) candidates in the age group of 3-4 years, 23 (12.7%) candidates in the age group of 4-5 years and 19 (10.5%) candidates in the age group of 5-6 years had early childhood caries. Within the three study group there was an occurrence of 44.28% in the 3-4 years age group, 42.5% in the 4-5 years age group and 35.1% in the 5-6 years age group.

Age group					
3-4 years		*4-5 years*		*5-6 years*	
Total Population	With ECC	Total Number	With ECC	Total Number	With ECC
70	31	54	23	57	19
38.60%	17.10%	29.80%	12.70%	31.50%	10.50%
Prevalance within group= 44.28%		Prevalance within group=42.5%		Prevalance within group=35.1%	

(Table 2: Age group)

Discussion:

There are various Epidemiological studies that have been carried out in various parts of the world which have shown that dental caries is one of the most widely distributed dental disease across the globe. Despite the availability of evidence-based preventive strategies for dental caries, the burden of dental caries is rapidly rising in India, which makes it important at this time to adopt and implement effective oral health policy for the governance of the country. In the present study it is evident that the incidence of early childhood caries is more prevalent in the age group of 3-4 years of age which is synonymous to the study conducted in the United States (12)

In the study conducted by Singh et al (13) conducted in Bangalore, in the age group of 3,4 and 5 year olds, 44.7%,34.9%, 41.02% of children were affected with dental caries when assessed within the group. In comparison to the present study in the age group of 3-4 years it is almost the same, whereas it is slightly increased in the age group of 4-5 years and slightly decreased in the age group of 5-6 years of age. Even though Thiruvallur is a rural area, the incidence is almost at the same level as of an urban area and thus it is evident that the oral hygiene practices and education regarding the same is at par with that of an urban area. But, the knowledge regarding the same is a lacunae present in all areas which is now evident. The same has to be corrected with immediate effect to prevent further progression.

In the study conducted by Tyagi P et al (14) in Maharashtra, in the group of 3 year olds, 4 year olds and 5 year olds, only 25.5%,32.98%,33.3% had dental caries respectively whereas in the present study a higher number of candidates are affected as visualised in Table 2. The total population affected in the Tyagi P et al (12) study was only 32% whereas in the present study 40.3% of the candidates are affected. This can be attributed to the fact that the Tyagi P et al study

was based on schools which included a wider population whereas the present study was hospital based and hence it was primarily patients who came in with dental complaints.

In a study conducted by Srikanth Koya et al (15) in the West Godavari District of Andhra Pradesh, the prevalence rate is about 41.9% which is actually higher than the present study which was attributed to diet practices in the particular geographic area such as rewarding the children with sweets which lead to further development of caries.

In a study conducted by Jose B et al (16) in Kerala the prevalence rate is about 44% which is again higher than the present study and the same is attributed to intermittent snacking habits that were present among the study population. On a broader perspective the prevalence of Early Childhood Caries in India is more prevalent in South India than in North India (17) which can be attributed to geographical factors as well as dietary habits that are varied between the two locations.

On a global scale when the present study is being compared in well developed countries such as Sweden and Italy the prevalance rates are about 11.4% and 7-19% respectively (18,19). This is significantly lower than the present study, this can be attributed to the fact that the aforementioned countries have varied water fluoridation projects incorporated into the drinking water, which would inturn improve oral health and reduce the incidence of dental caries in all. The same can be undertaken in India as well to bring forth improvement in the oral hygiene of patients.

A high prevalence of Early Childhood Caries has been reported in some Middle Eastern countries, such as Palestine (76%) and the United Arab Emirates (83%) (17,18). This when compared to the present study appears that India is in a better position but the overall oral hygiene can be improved. Developed countries such as the United States have a prevalence of about 3-6% (20,21) which is significantly lower. There is a wide variation of caries prevalence throughout the country, This could be attributed to differences in dietary practices, cultural beliefs and the perceived importance of oral hygiene and oral health.

As a conclusive aspect it is important to take care of oral health and appropriate policies are to be adopted and incorporated for the betterment of the society.

References:

1. Retnakumari N, Cyriac G. Childhood caries as influenced by maternal and child characteristics in pre-school children of Kerala – An epideomological study. Contemp Clin Dent 2012;3:2-8.
2. Preethi BP, Reshma D, Anand P. Evaluation of flow rate, pH, buffering capacity, calcium, total proteins and total antioxidant capacity levels of saliva in caries free and caries active children: Anin vivo study. Indian J Clin Biochem 2010;25:425-8
3. Animireddy D, Reddy Bekkem VT, Vallala P, Kotha SB, Ankireddy S, Mohammad N. Evaluation of pH, buffering capacity, viscosity and flow rate levels of saliva in caries-free, minimal caries and nursing caries children: Anin vivo study. Contemp Clin Dent 2014;5:324-8.
4. Douglass JM, Clark MB. Integrating oral health into overall health care to prevent early childhood caries: Need, evidence, and solutions. Pediatr Dent 2015;37:266-74.
5. American Academy of Pediatric Dentistry. Definition of Early Childhood Caries (ECC).
6. Kagihara LE, Niederhauser VP, Stark M. Assessment, management, and prevention of early childhood caries. J Am Acad Nurse Pract 2009;21:1-0.
7. Kuriakose S, Prasannan M, Remya KC, Kurian J, Sreejith KR. Prevalence of early childhood caries among preschool children in Trivandrum and its association with various risk factors. Contemp Clin Dent 2015;6:69-73.
8. Singh S, Vijayakumar N, Priyadarshini HR, Shobha M. Prevalence of early childhood caries among 3-5 year old pre-schoolers in schools of Marathahalli, Bangalore. Dent Res J (Isfahan) 2012;9:710-4.
9. Perera PJ, Fernando MP, Warnakulasooriya TD, Ranathunga N. Effect of feeding practices on dental caries among preschool children: A hospital based analytical cross sectional study. Asia Pac J Clin Nutr 2014;23:272-7

10. Shashidhara R, Maiya AS, Ramakrishna BV. India's integrated child development scheme and its implementation: Performance of anganwadi and analysis. OIDA Int J Sustain Dev 2012;5:29-38.
11. Gaidhane AM, Patil M, Khatib N, Zodpey S, Zahiruddin QS. Prevalence and determinant of early childhood caries among the children attending the anganwadis of Wardha district, India. Indian J Dent Res 2013;24:199-205.
12. Ramos-Gomez FJ, Weintraub JA, Gansky SA, Hoover CI, Featherstone JD. Bacterial, behavioral and environmental factors associated with early childhood caries. J Clin Pediatr Dent (2002) 26(2):165–73
13. Singh S, Vijayakumar N, Priyadarshini HR, Shobha M. Prevalence of early childhood caries among 3-5 year old pre-schoolers in schools of Marathahalli, Bangalore. Dent Res J (Isfahan) 2012;9:710-4.
14. Tyagi P. The prevalence and pattern of dental caries in preschool children. People's J Sci Res 2009;2:1-4
15. Koya S, Ravichandra KS, Arunkumar VA, Sahana S, Pushpalatha HM. Prevalence of early childhood caries in children of West Godavari District, Andhra Pradesh, South India: an epidemiological study. International journal of clinical pediatric dentistry. 2016 Jul;9(3):251.
16. Jose B, King NM. Early childhood caries lesions in preschool children in Kerala, India. Pediatric dentistry. 2003 Nov 1;25(6).
17. Malvania EA, Ajith Krishnan CG. Nursing caries prevalence among preschool children of Piparia village, Vadodara, Gujarat. J Oral Health Community Dent. 2011;5:37-41.
18. Stromberg U, Holmn A, Magnusson K, Twetman S. Geo-mapping of time trends in childhood caries risk – a method for assessment of preventive care. BMC Oral Health (2012) 12
19. Nobile CG, Fortunato L, Bianco A, Pileggi C, Pavia M. Pattern and severity of early childhood caries in Southern Italy: a preschool-based cross-sectional study. BMC Public Health (2014) 14
20. Azizi Z. The prevalence of dental caries in primary dentition in 4- to 5-year-old preschool children in northern Palestine. Int J Dent (2014) 2014

21. El-Nadeef MA, Hassab H, Al-Hosani E. National survey of the oral health of 5-year-old children in the United Arab Emirates. East Mediterr Health J (2010) 16(1):51–5
22. Horowitz HS. Research issues in early childhood caries. Community Dent Oral Epidemiol (1998) 26(1 Suppl):67–81
23. Johnston T, Messer LB. Nursing caries: literature review and report of a case managed under local anaesthesia. Aust Dent J (1994) 39(6):373–81