ORIGINAL ARTICLE

Early Childhood Caries among Children upto 71 Months of Age in Karachi, Pakistan

Shahbano Syed, Nighat Nisar and Nida Mubeen

ABSTRACT

Objective: To determine frequency of Early Childhood Caries (ECC) among children upto71 months age in Karachi Pakistan.
ECC is a devastating form of caries that may affect the primary dentition soon after infant teeth eruption and encompasses specific teeth and surfaces for children under 6-years of age. The persistent rise in ECC prevalence is a great challenge for dental health profession throughout the world and determining the region specific burden of ECC is necessary so that early preventive and appropriate treatment strategies can be applied.
Materials and Methods: A Cross-sectional study was conducted in Karachi, Pakistan during 2009-2010. A sample size of 650 was calculated and children of up to 71 months of age with fully erupted teeth, born or resident of Gulberg Town, Karachi, Pakistan were included in the study. The selected households were visited and the child up to 71 months age group examined for the presence of ECC and mothers were interviewed through administering a semi-structured questionnaire.
Results: About 650 children were examined, 302(46.5%) were boys and 348(53.5%) were girls. The proportion of ECC was found to be 23.5 % with mean dmft of 0.67. Considering primary central incisor (tooth # 51) of 650 children, 502 (77.2%) toddlers had sound incisor, 117 (18%) had decayed, filled with was in 1 (0.2%) child, missing due to caries were in 11 (1.7%), missing due to other reason were in 14 (2.2%) while 5 (0.8%) went through trauma. The mean dmft of our sample frame was 2.12.
Conclusion: The proportion of ECC was high with increased frequency of dental caries among central and lateral incisors.

Key words: Frequency, ECC, Children, Karachi, Pakistan.

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INTRODUCTION

ECC is a public health problem affecting infants and preschool children worldwide. It is a diet induced disease and posed a challenge to the dental profession through-out the developing and developed world[1-2]. An in-depth understanding and awareness about the natural history of ECC is required to facilitate reduction of burden and acquire concepts helpful in inhibiting dental caries among young children[3]. The further exploration of the disease is required in order to design and implement comprehensive preventive and treatment strategies[4].

ECC is a devastating form of caries that may affect the primary dentition soon after the infant teeth eruption[5-6]. ECC encompasses specific teeth and surfaces for children under 6-years of age[7]. Its prevalence varies among populations and its extent amidst individuals[7].

A study conducted in Manchester showed 19% maxillary-incisor caries in preschool children[8] and another study from Switzerland showed 21% caries in deciduous incisors[9]. In Tehran Iran ECC reported 3-26% of children depending upon the age group[10]. A study conducted in Davangere, India[11] reported 19.2% ECC prevalence in preschool population. The disease distribution varies across the countries and it requires further research and interventions according to country specific needs[12].

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This persistent rise in dental caries prevalence among young ones is an exception to the advances in the economy and health status worldwide[7]. The risk factors for dental caries are identified as biological, social, and behavioural factors raising burden on health system and compromising quality of life and adding cost to the treatment[13-14]. In early childhood caries, the smooth surfaces of the maxillary incisors are commonly involved at an early stage, whereas in other form of dental caries involvement of these sites come at a later stage in the disease process. Initial changes are usually observed at the end of first year of life, and it progresses to involve molars and canines as they erupt. This is an aggressive form of ECC and may be called an acute event[15]. An essential requirement for this is an early infection, usually with the mother's cariogenic bacteria, for example, at ages between 19-31 months[4]. These evidences showed that majority of the factors leading to ECC are preventable and requires early detection and prompt treatment. This study determines frequency of ECC upto71 month's age group of children in Pakistan. The uniqueness of this study is that it's a community based study, previously reported studies were school-based studies which did not include the children below 24 months of age group.

Objective: To determine frequency of ECC upto71 months age group of children in Karachi Pakistan.

MATERIALS & METHODS

A Cross-sectional study was conducted in Gulberg Town of Karachi, Pakistan during 2009-2010. Ethical approval for the study was obtained from the Institutional Review Board of Dow University of Health Sciences (ERB-105/DUHS-09).

A sample size of 650 was calculated by keeping the proportion of ECC 19.2%[12] with 95% confidence interval and 3% margin of error with design effect 1.0.and power of test 80%. The children of one to 71 months of age with fully erupted primary anterior teeth, born or resident of Gulberg Town, Karachi, Pakistan were included in the study. The sampling was done in two stages. In the first stage 4 Union Councils of Gulberg town were randomly selected out of total 8 Union Councils. In the second stage the list of house hold was obtained and the required sample size was achieved by simple random sampling using random number table. The selected households were visited and the child of (1-71 months) age group examined for the presence of ECC and the mother interviewed through administering a questionnaire. In case, the child of that particular age group was not found in that household, second adjacent household was visited till the required sample size was achieved. In the main course of the study the child was examined by the dentist, who was calibrated against a standard examiner. Inter-examiner reliability was 92% with a kappa = 0.85. The intra-examiner reliability was 97% in agreement with kappa = 1.0. The informed consent was obtained at the time of interview and clinical examination of the child. Clinical examination of the child teethes present at time of examination was done under natural light at knee-to-knee position with an auto-claved mouth mirror using disposable gloves and mask and a gauze to dry the tooth. The WHO diagnostic criterion (annex I) was used for diagnosis of dental caries[16]. ECC was diagnosed according to the following criteria: the presence of caries on the labial or lingual surfaces of at least two maxillary incisors with the absence of caries in mandibular incisors[17-18]

RESULTS

Caries distribution according to tooth number and dmft: The dmft score (decayed, missing & filled) according to the number of teeth involved was 497 (76.5%) children had no caries, 15 (2.3%) children had one tooth involved, 58 (8.9%) children had two teeth involved in carious process, 14 (2.2%) children had 3 teeth involved, while 66 (10.2%) children had all 4 carious primary incisor teeth. (Table 1)

Table 1: Caries distribution according to Tooth Number and dmft:

Variables	Frequency N= 650	Percentage (%)
Caries Status 51 Decayed	117	18.0
Caries Status 52 Decayed	83	12.8
Caries Status 61 Decayed	117	18.0
Caries Status of 62 Decayed	80	12.3

Caries frequency with tooth location in Primary Dentition: Caries frequency in maxillary right and left central incisor was similar (18.0%) and the frequency in right and left lateral incisor were 12.8% and 12.3% respectively. (Table 2a)

Caries frequency with bilateral tooth involvement: The primary upper central incisors were found to be carious bilaterally in 19.3% of the case at the same time bilateral involvement of primary upper lateral incisors was in 12.3 % of examined teeth. (Table 2b)

Table 2a: Caries frequency with tooth location in Primary Dentition:

Tooth	Maxillary R (%)	L (%)	Total (%)
Central incisor	18.0	18.0	18.0
Lateral incisor	12.8	12.3	12.5

Table 2b: Caries frequency with bilateral tooth involvement

Tooth	Maxillary Frequency (n)	Percentage (%)
CI (#5161)	121	19.3
LI (#5262)	79	12.3

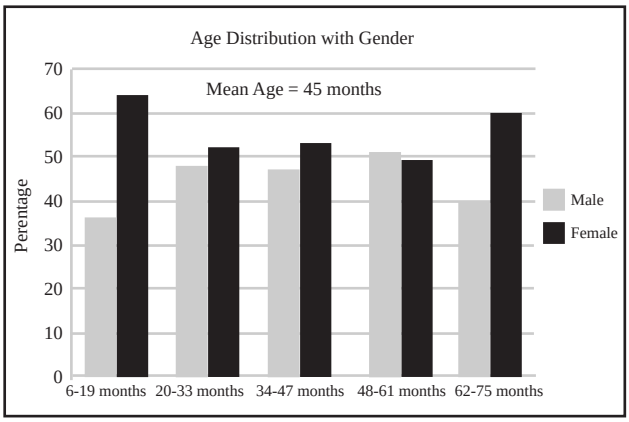

Figure 1: Age Distribution of Sample Population According to Gender

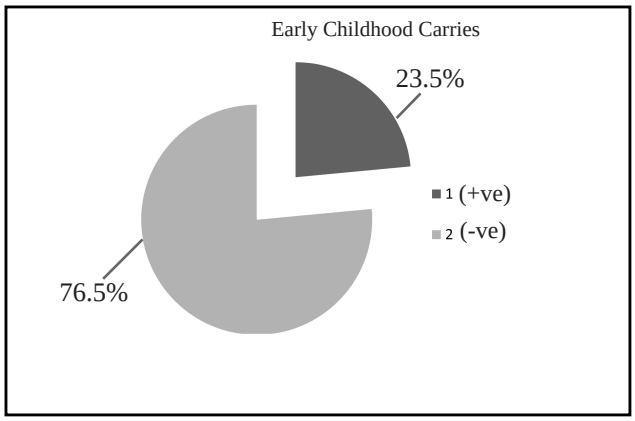

Figure 4: Frequency of Caries

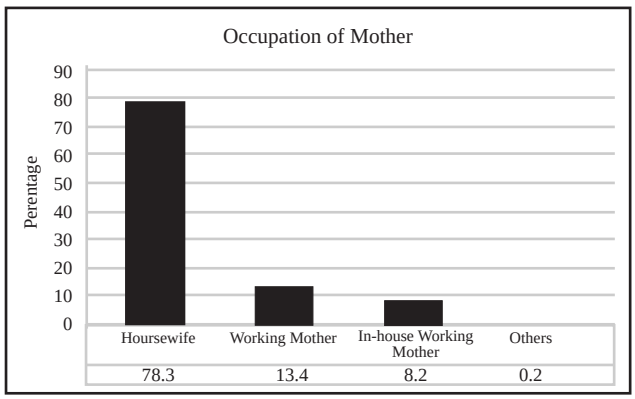

Figure 2: Occupation of Mother

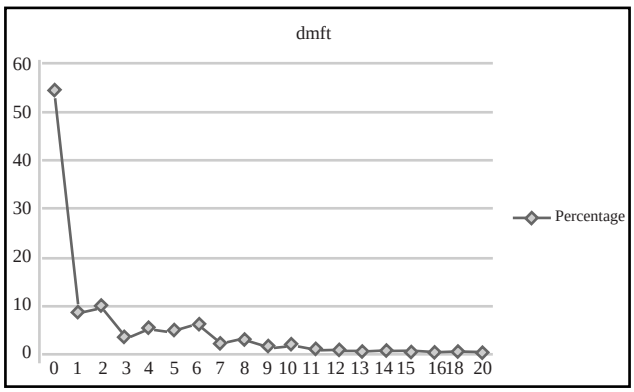

Figure 5: Frequency of Dental Caries (dmft)

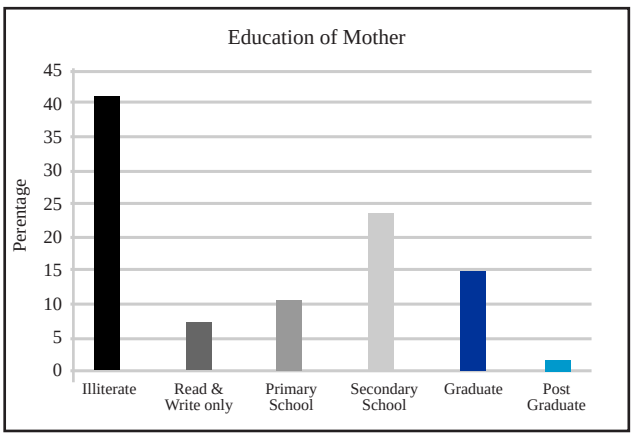

Figure 3: Education of Mother

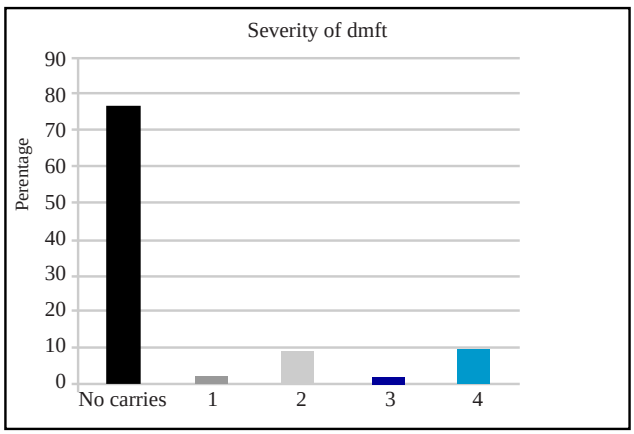

Figure 6: Severity of dmft (according to number of teeth involved)

DISCUSSION

The present study determines the frequency and severity of ECC within a community. This community consisted of disadvantaged population which is predisposed to early childhood caries. ECC pessimistically effects excellence of life of young children all over the globe[19-20]. The children consume human or bovine milk in early infancy and later put on weaning solid food and these foods had wide range of differences in nutritional value. At the same time or a little later, youngster starts going to school, with access to different snacks at school cafe'. Along with this and other social factors being part of child upbringing, and imbalance of which predisposes a child habits and patterns leading to dental caries and other associated diseases[13-14].

This study showed high proportion ECC and results revealed that ECC still represents a consistent burden in our population. Similar findings observed in studies conducted in southern Italy[21], Europe[22], India[23] and Sweden[24] irrespective of the divergent geographical distribution of these countries. The dmft scores were almost the same for both male and female in current study. The studies conducted at Navajo[25] and Jordon[26] reported that there were no gender differences in caries prevalence. When examined for the number of maxillary incisor teeth involved, two third of the study sample had two carious teeth and almost the same ratio was observed for all four upper incisors. One of the studies[27] in the literature was available which computed similar results but their proportion of carious dentition was relatively high. The most likely reason of discrepancy could be the life style and oral hygiene practices of the Gulf region and cultural restraints towards treatment. Among the anterior teeth, the primary maxillary central incisors were mostly involved whereas mandibular incisors were the least affected. These findings are consistent with the findings of study conducted on caries prevalence, severity and pattern[28] and a Tanzanian study[29]. Another study[30] likewise furnished similar results. Multiple reasons can be derived for such finding, the foremost being the close approximation of the contact points and between the tooth and first hand, direct exposure to intake and pooling of cariogenic food in close vicinity of these teeth[29] and last but not least, they are also the first teeth to erupt getting prolonged exposure of cariogenic challenges[31-32]. Mandibular incisors are guarded by the tongue and are constantly bathed in saliva, which is an additional protection for these teeth, and hence their low prevalence in carious process[33]. Even though the multifactorial etiology of ECC is now well established, the question of why certain groups are at more risk demands further investigation.. Future studies may explore dietary habits and frequency of sweetened food intake as contributing factors.

CONCLUSION

The proportion of ECC was high with increased frequency of dental caries among central and lateral incisors.

Recommendations: The future health programs should be focused on prevention of early childhood caries so that the high burden of early childhood caries can be reduced. The community based analytical studies are recommended for future research so that associated factors of ECC can be determined in our setting.

Conflict of interest: The authors declare that they have no competing interest.

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