

Prevalence and awareness of early childhood caries among attendees of a reproductive and child health clinic at Mnazi Mmoja Dispensary, Dar es salaam

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Abstract

The aim of this study was to determine the prevalence, and awareness of early childhood caries (ECC) among attendees of a Reproductive and Child Health clinic at Mnazi Mmoja dispensary in Dar es Salaam. The parents or guardians were aged 16-55 years old, while the children were aged 6-36 months. Caries was scored according to WHO criteria (1997). A structured questionnaire, translated in Kiswahili was used to inquire on awareness in etiology and prevention of early childhood caries. Caries prevalence was 26.4% among the children examined, 22% of the children had caries on maxillary central incisors and 8% had caries on maxillary lateral incisors. None of the children had caries on the upper molars. About 57% of the caries was on maxillary central incisors, and only 4% on mandibular central incisors. The participants indicated that the causes of ECC are; frequent consumption of sugary foods (59%), improper tooth brushing (10%) and frequent use of medicinal syrups (8%). Regarding prevention, 31% of the participants knew that restricting use of sucrose foods prevents early childhood caries, while none of the mothers knew that not practicing breastfeeding at will and restriction of frequent bottle feeding prevents ECC. Parents who attained secondary school education were more aware of ECC than those who attained primary school education only. From the results of this study it is concluded that the prevalence of ECC in this study group is high and within the range previously reported, ECC was not related to breast feeding at will. Furthermore, we conclude that a high percentage of parents studied knew what ECC is, a substantial proportion knew its cause but few knew its prevention.

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Introduction

Early childhood caries (ECC) is a term used to describe dental caries occurring in infants and toddlers. Previously, various names such as nursing caries, baby bottle tooth decay, rampant caries, labial caries, maxillary anterior caries, and other terms were used to refer to severe dental caries in preschool children. Nowadays, all clinical manifestations are classified as early childhood caries (1). ECC describes caries experience on at least one primary tooth in children under six years of age. It is the most common chronic disease in young children and may develop as soon as the teeth erupt. Thus, it presents a serious problem in pediatric dentistry not only because of its rapidity but also because of the age of the affected children (2). In addition to bringing pain and suffering to the children during developmentally vulnerable period of life, ECC contributes to below normal weight as well as to reduced stature (3).

The severe pattern of ECC that attack the maxillary primary incisors have been named by Drury et al. (1999) as severe early childhood caries or in short SECC (4). SECC may lead to

pain, abscess formation, chewing difficulties, malnutrition and malocclusion (5). When SECC has occurred, its treatment may require extensive and costly restorative work or tooth extraction (6, 7).

The reported etiology of ECC include at will breast feeding, extensive bottle feeding, frequent use of medicine in syrup form and sucrose containing comfort foods that are used as emotional pacifiers (3). Rosenblatt and Zarzar (2004) further report that most parents of children with ECC give a bottle straight from birth (3). These bottles most often contain sugared drinks and are given during day time as well as at night. Furthermore, ECC has been reported to be significantly related to feeding practices, snacking habits, oral health practices and pattern of dental visits as well as socioeconomic background (8). According to Huntington et al. (2004) parents in families whose children had no ECC were significantly more likely to have visited the dentist recently and the children were less likely to sleep while feeding compared to families with an ECC-affected child (9).

Evidence reveal that the prevalence of ECC range from 6.8-76%, depending on diagnostic criteria and area of study; also, whether it is a clinical or community setting. Community based studies show a prevalence range from 6.8-30% (10-13), while hospital based studies indicate that the prevalence range from 36.5-76% (13,14). In another study, Carino et al. (2003) found a prevalence of ECC to increase from 59% in children aged 2 years to 94% in children aged 5 years and a slight drop to 92% among children aged 6 years (15).

In Tanzania, the prevalence of ECC was reported by Matee et al. (1990) to be 6.8% (10). They further reported that the prevalence varied considerably between 1.5% and 12.8% in different regions and was closely associated with the varying prevalence of linear hypoplasia but not with fluoride content in drinking water. Whereas, Rugarabamu (1990) reported a 49% prevalence of caries among three year olds, Mosha et al. (1994, 2005) in two National Oral Health Surveys reported prevalences of 24% and 25% among 5-6 year old Tanzanian children (16-18).

ECC continues to be a problem to young children, families and dental professionals, and its treatment requires extensive and costly restorative procedures or extraction (6, 7). Thus, if ECC will be prevented it will relieve children of the suffering associated with the condition. A preventive approach is the policy advocated by both the World Health Organization (WHO) and the Tanzanian government. For a successful preventive approach, however, the community in question should have good level of awareness of the condition to be prevented. Furthermore, prevention of ECC will not only reduce cost to parents but also will cut down the work load to dental personnel. Unfortunately, the prevalence and level of public awareness of ECC in Tanzania has not been sufficiently studied. Therefore, the aim of this study was to determine the prevalence, and awareness of early childhood caries among attendees of a Reproductive and Child Health clinic at Mnazi Mmoja dispensary in Dar es Salaam.

Subjects and Methods

Subjects

The target population was all children aged 6-36 months and escorting mothers or guardians

attending the reproductive and child health clinic, Mnazi Mmoja dispensary, Dar es Salaam. A minimum sample of 127 participants was required. Records at Mnazi Mmoja clinic showed that 40-70 mothers brought their children to the clinic daily from Monday to Friday. A systematic sampling was done by recruiting every third client, (about 13-33 mothers and children per day) until the required number was attained. In this study a total of 159 mothers/guardians aged 16-55 years and their 159 children aged 6-36 months participated.

Methods

This study was a cross sectional descriptive study, conducted at Mnazi Mmoja dispensary. Data collection was done through clinical examination as well as using a structured questionnaire, translated in Kiswahili.

Examination for ECC was conducted in a room within the clinic with the client seated next to a window to allow utilizing natural daylight. During examination, the child was held on the mother's lap. Caries was diagnosed using WHO (1997) criteria (19). Caries lesions were recorded as present when a carious cavity was apparent on a visual, nontactile technique, referred to as a "lift the lip" caries assessment. If in doubt, the tooth was scored sound as no probing was done. Intra examiner calibration was done before the survey. Kappa score of 0.685 was attained. The questionnaire was used to inquire on awareness of etiology and prevention of ECC and on breast feeding practices. Data was entered in a computer and analyzed using SPSS program (version 11). Chi square test was used to test for significance. $P = 0.05$ was chosen as a level of significance.

Permission to carry out this study was obtained from responsible authorities. Mothers/guardians were informed about the aim of the study, and all of them gave their informed consent.

Results

Occurrence of ECC

ECC was found in 26.4% of the children (Fig 1). About 36% of the children found to have or to suffer ECC had 2 teeth affected, only two children had seven to eight teeth affected by caries (Table 1).

Prevalence and awareness of early childhood caries

Table 1: Number of teeth affected by caries

No of teeth affected	Frequency	Percentage out of total n=159	% out of those with ECC n=42
1	12	7.5	28.6
2	15	9.4	35.7
3	2	1.3	4.8
4	7	4.4	16.7
5	2	1.3	4.8
6	2	1.3	4.8
7	1	0.6	2.4
8	1	0.6	2.4

Twenty two percent of the children examined had caries on maxillary central incisors, and 8.2% had caries on maxillary lateral incisors (Table 2). Caries on mandibular molars were seen in 3.8% of the children while not a single child had caries on upper molars. The tooth specific caries prevalence showed that nearly 80% of all the carious teeth were found on the maxilla, with 57% being maxillary central incisors (Table 3). Mandibular teeth were less affected, with most of the caries found on first molars, which constituted about 9% of all the caries. No caries was found on lower canines, or upper molars.

Table 2: Percentage distribution of children with caries per tooth type.

Teeth affected by caries	Frequency	Percentage out of total n=159
Maxillary central incisors	35	22
Maxillary lateral incisor	13	8.2
Mandibular molars	6	3.8
Mandibular central incisors	3	1.9
Mandibular lateral incisor	2	1.2
Maxillary canines	2	1.2

There was no statistical significant relationship between occurrence of ECC with at will breast feeding, bottle feeding or mothers' education.

Table 3: Tooth specific caries prevalence

Teeth affected by caries	Maxillary	Mandibular	Total
Central incisors	56.6%	4.4%	61%
Lateral incisor	20.4%	1.8%	22.2%
Canines	1.8%	0%	1.8%
First molars	0%	8.8%	8.8%
Second molars	0%	6.2%	6.2%
Total	78.8%	21.2%	100%

Awareness of ECC

Of the 159 parents/guardians who participated, 84.3% knew what is early childhood caries. About 60% of the participants knew frequent consumption of sugary foods, 10.1% knew improper tooth brushing and 8% knew frequent use of medicinal syrups as causes of ECC. Breastfeeding at will and extensive bottle feeding were known by only 1.3% and 1.9% of the mothers respectively (Table 4).

Table 4: Mother's awareness on causes of ECC

Cause of ECC	Yes	
	Frequency	Percentage
Frequent consumption of sugary foods	94	59.1
Improper tooth brushing	16	10.2
Frequent use of medicinal syrup	13	8.2
Occurs naturally	5	3.1
Hereditary	5	3.1
Extensive bottle feeding	3	1.9
Breast feeding at will	2	1.3

With regard to prevention of ECC, 31.4% of the participants knew that restricting the use of sucrose containing foods can prevent ECC. Nevertheless, none of the mothers knew that not practicing breastfeeding at will and restriction of frequent bottle feeding can prevent early childhood tooth decay (Table 5). There was a significant association between awareness of ECC and parents' education. Ninety three percent of those who attained secondary school

education were aware of ECC compared to 79% of those who attained primary school education, (Pearson chi-square = 5.082, P= 0.025). Also, 79% of those who attained secondary school education knew that frequent use of sugary foods cause ECC compared to 48% of those who attained primary school education, this difference was highly significant, (Pearson chi-square = 14.454, P= 0.0001). More (49%) parents who attained a secondary school education knew that restricting sucrose foods prevents ECC compared to only 22% of those who attained primary school education, the difference was significant, (Pearson chi-square = 12.878, P= 0.01) (Table 6).

Table 5: Mother's awareness on prevention of ECC

Prevention	Yes	
	Frequent	Percentage
Restricting use of sucrose foods	50	31.4
Proper oral hygiene	16	9.9
Use of vaccine	5	3.1
No prevention	3	1.9
No breast feeding at will	0	0
Restricting frequency of bottle feeding	0	0

Feeding practices

Breast feeding was practiced by all except one mother, whereas bottle feeding was used by only 3% of them. At will breast feeding during the day was practiced by 42% of the mothers while 34% did so at night.

Table 6: Participant's awareness on ECC, cause and prevention of ECC by education

	Up to primary school education		Secondary or college education		Pearson Chi-square	P- value
	n	%	n	%		
Awareness of ECC	81	79	53	93	5.082	P = 0.025
Aware that frequent use of sugary foods cause ECC	49	48	45	79	14.454	P = 0.0001
Aware that restricting sucrose foods prevent ECC	22	22	28	49	12.878	P = 0.01

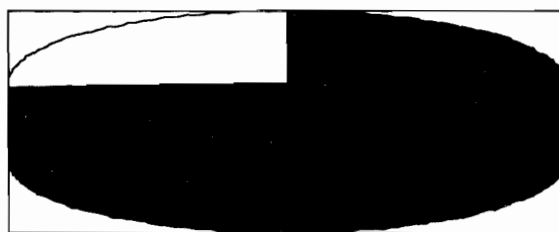
Discussion

During oral examination of such young children, no sharp or hard instruments are recommended. This poses a challenge on interpretation of the findings, since over or under estimation of caries may occur.

Caries prevalence in the current study is higher (26%) than the 6.8% that Matee et al. (1994) reported. This big difference may be explained through two scenarios. First, in their study Matee et al. did not include Dar es Salaam, a cosmopolitan city, whereas, the current study was done within the city of Dar es Salaam. Secondly, in their study, the prevalence of ECC varied considerably between regions from 1.5%

to 12.8%, indicating the existence of true variations in occurrence of ECC within Tanzanian regions. However, our observations are similar to 24% and 25% reported by Mosha et al. (1994, 2005) in two Tanzanian national oral health surveys (17,18). Likewise, our findings correspond to prevalences ranging from 19% to 28.4% reported in Brazil, Kuwait, and Saudi Arabia (3,12,20). On the other hand, the prevalence observed in this study is lower than 49% to 94% reported in Tanzania, Sweden and Philippines (15,16,21). Our findings indicate an early onset of ECC, which suggest a need for advocacy of tooth brushing practice using fluoridated tooth paste for young children.

Figure 1: Caries prevalence among the studied child population



Legend: Occurrence of caries among the studied children
73.6% were caries free while 26.4% had caries

The findings of this study that 22% of the children had caries on maxillary central incisors, only 2% had caries on mandibular incisors and the most affected teeth were maxillary central incisors (57%) is lower than 93.9% reported by Wyne et al. (2001) and 56% to 75% among Philippines as was reported by Cariño et al. in 2003, (15,21). In the Tanzanian community resources are scarce and dental visit for routine check-up is virtually unknown. Furthermore, the community is overwhelmed by more life threatening diseases like malaria, TB, malnutrition and HIV/AIDS. For these reasons, people are likely to give little priority to caries in the deciduous dentition because they consider them not important, since they are gradually replaced by the permanent ones as the child advances in age. Therefore, management of ECC demands a continuous and sustainable oral health education programme to expectant and young mothers to increase awareness that ECC is a public health problem but is preventable.

Although Matee et al (1994) and Hallonsten et al. (1995) reported that breast feeding at will especially at night and particularly allowing infants to sleep with the breast nipple in their mouths could be a risk factor for dental caries in breast fed children, no such significant association was seen in this study (10,20). To a large extent, breast-feeding practices depend on social norms, advice from medical professionals and on traditions (21). In Tanzanian, depending

on these factors, majority of the mothers breast feed at will which probably explain a lack of statistical significant relationship between occurrence of ECC with breast feeding at will in this study. On the other hand, our findings are similar to those of Rosenblatt and Zarzar (2004) who reported lack of significant association between caries and type of feeding (3).

A high proportion of the mothers knew ECC. Similarly most of the mothers knew that restricting use of sucrose food prevents tooth decay. This is commended and should be reinforced. However, very few knew that breastfeeding at will and extensive bottle feeding can cause ECC. Moreover, none of the mothers knew that not practicing breastfeeding at will and restriction of frequent bottle feeding prevent ECC. In Tanzania, breast feeding is practiced by nearly all the mothers. Besides, the practice is advocated at reproductive and child health clinics according to WHO recommendations. For this reason, it is unlikely for the mothers to think of any negative effect of such a practice. On the other hand, bottle feeding is less common in Tanzania. This is probably because the practice is discouraged at reproductive and child health clinics and also because most mothers are housewives who spend most of the time with their children, thus, do not need to use bottles for feeding. These findings denote a need for the dental profession to bridge the knowledge gap among the parents about the possible relationship

of ECC and breast feeding as well as bottle feeding.

As would be expected, mothers who attained a secondary school education were more aware of ECC than those who attained a maximum of primary school education. Since most Tanzanian mothers are primary school leavers, efforts to prevent ECC should target those groups either during the last years of primary school education or at Reproductive and Child Health clinics.

Conclusion

From the results of this study we conclude that the prevalence of ECC in this study group is high and within the range previously reported. ECC was not related to breast feeding at will. We further conclude that a high percentage of parents studied knew what ECC is, a substantial proportion knew its cause but few knew its prevention.

Recommendation

The authors recommend to the dental profession to institute intentional efforts to raise awareness of causes and prevention of ECC among parents in Tanzania.

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A person got his uncle checked up by a doctor and then Enquired on the phone, "there is nothing wrong with your uncle. I have examined him thoroughly and I tell you he only thinks he's sick. He thinks he's sick"

*A week later the doctor met the patient's nephew.
"How's you uncle?" he asked.
"Worse," said the relative. "now he thinks he's dead."*