Original research article

Assessment of Feeding Practices and its Impact on Dental Caries in Preschool Children With Cleft Lip and Palate: A Cross-Sectional Study

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Abstract

Introduction: Children with cleft lip and palate are at high risk of developing dental caries which outranks other oral diseases in occurrence. Complete cleft lip and palate pose various feeding difficulties and could result in lack of weight gain, failure to thrive condition and choking etc.

Aim: To assess the influence of feeding practices on dental caries in children with cleft lip and palate.

Method: A total of 100 mothers of non - syndromic children with complete cleft lip and palate within age group 0 to 6 years were randomly selected and to whom, a well-structured questionnaire was given in English and regional language (Telugu) to evaluate the awareness among mothers on feeding practices and ECC in children with cleft lip and palate.

Results: Dental caries was observed in 57% of children and 47% of children were found to be caries free. Among children with caries, a greater percentage (39.6%) of children was bottle fed with regular bottle. But 75% of children who used spoon and cup for feeding were under high caries risk. Children who were only breast fed were under low risk.

Conclusion: Feeding practices can be considered as potential caries risk factor in children with cleft lip and palate. Use of modified bottle showed decline in dental caries so parents should be counseled regarding use of modified bottle in children with cleft lip and palate.

Key words: Cleft lip and palate, caries risk, feeding practices, Pre-school children

Introduction

The word "Cleft" in common parlance refers to "split or breach in continuity". Cleft lip and palate are the birth defects that occur when infant's lip or mouth do not form properly during 4th to 7th week of pregnancy. Among birth defects, a complete/incomplete cleft lip and palate is one of the most common congenital deformities but with varied range in occurrence ranging from 0.28 to 3.74 globally and 0.25 to 1.56 per 1,000 live births, India.[1]An infant

with complete cleft lip and palate usually have few oral and systemic complications like feeding difficulty, ear infections, speech difficulty, dental problems, psychosocial conflicts etc. The most prevailing difficulty for an infant with complete cleft lip and palate is the difficulty in breast/bottle feeding. Feeding difficulties are due to inability to create suction during breast feeding, excessive air intake and nasal regurgitation because of wide cleft defect in lip and palate, leads to fatigue due to prolonged duration of feeding, and associates with inadequate milk intake. Literature review had shown multitudinous approaches to annihilate these feeding difficulties viz. use of feeding plate/obturator, presurgical orthopedics and modified bottles etc. *In lieu* of obturators, the standard feeding techniques have been modified by careful and proper positioning of the baby's head during feeding, use of cups and spoons and bottles with modified teats.

The high prevalence of dental diseases in children with cleft lip and/or palate could be attributed to irregularity of teeth, anatomy of cleft area, tight repaired lip with a tendency for food to accumulate in the cleft area, nasal discharge through cleft which acts as a nidus for cariogenic microorganisms, hypoplastic defects, prolonged feeding especially at night time and increased consumption of sugary foods.Prevalence of dental caries and its relation to feeding practices in preschool children with cleft lip and palate is largely unexplored. Hence, the present study has been undertaken to assess and evaluate the relationship between feeding practices (breast feeding, bottle feeding, snacking pattern, and oral hygiene practices being followed) and ECC in preschool children with cleft lip and palate.

Materials And Methods:

The study was performed by the Department of Pedodontics, Kamineni Institute of Dental Sciences, Narketpally, Nalgonda Dt., Telangana State after obtaining the clearance from the Institutional review board and ethical board. After taking permission from the concerned authorities, initially preschool children with cleft lip and palate were screened in GSR craniofacial institute, Hyderabad and informed verbal consent from the parents (participants) of the selected children was obtained before the commencement of the study. A total of 100 mothers of non – syndromic children with complete cleft lip and palate within age group 0 to 6 years were randomly selected to appraise the type of feeding practices followed and its impact on dental caries. The children with complete cleft lip and palate (under the age 6 years) of these mothers were examined to record ECC/ dental caries using DMFT/dmft index.

Exclusive breastfeeding was defined as feeding the child only with breast milk, without giving solids or any other food (not even water) for a specified period since birth. Age of starting complementary feeding was defined as the age at which solids and semi-solids were introduced to the child in addition to milk. At first, mothers were allowed to describe how they fed their children and specific questions were asked to verify the validity of the information, or help the mother to remember details. A well-structured questionnaire was prepared in English and regional languages (Telugu) to evaluate the feeding methods followed and its impact on dental caries in children with cleft lip and palate. This questionnaire was categorized into four sections. First section included the basic demographic data, age of the mother and child, education status of the mother, type of cleft, timing of repair and consanguinity of parents. The second section of the questionnaire emphasized on the type of feeding methods practiced (breast, bottle, breast and bottle and spoon and cup), duration of the followed method of feeding (10 min., 10-15 min and more than 15 min.), weaning, use of modified bottle (yes/no), night feeding, and in between meal snacking. The third and fourth sections included oral hygiene maintenance (finger brush/baby finger) and teeth present (FDI tooth numbering system) and teeth with dental caries using DMFT/dmft

index.Intra oral examination was done in day light using mouth mirror and probe. Assessment of dental caries was done using 'DMFT/dmft' index. Children who had one or more decayed, missed (due to decay) and filled teeth were considered as affected with dental caries. Children with 'dmft' score 0,1 and 2 were graded as low risk group; 3,4 and 5 as moderate risk group, 6 or more than 6 were graded as high risk group.

The data recorded and tabulated from the answered questionnaire was statistically evaluated using Chi-square test as the test of significance. Statistical analysis was done using Microsoft excel and SPSS version 2.0 for each of the survey items and assessment domains (early childhood caries and feeding practice), a frequency and percentages were determined.

Results:

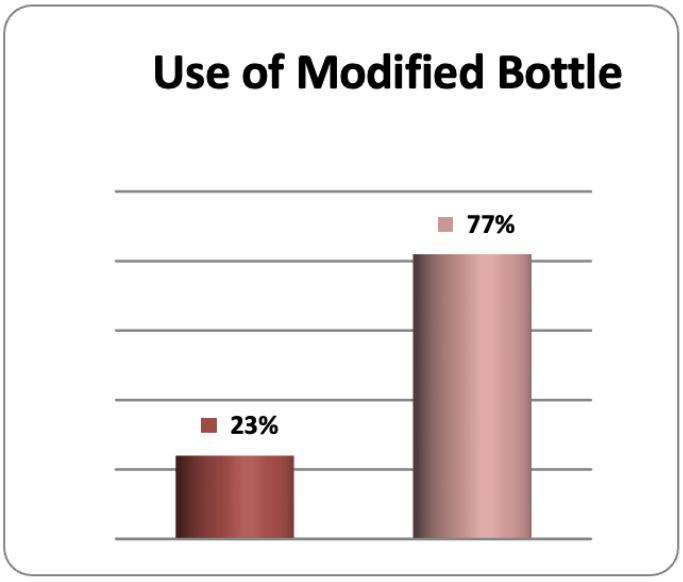
A total hundred observations were recorded. The age of the study children ranged from 0 to 6 years. Prevalence of caries was seen in 57% of children were as 47% of children were caries free. On evaluation of feeding method practiced, 17% of children were breast fed, 39.6% were bottle fed with regular bottle only, 18.9% of children were fed with both breast and bottle and 24.5% of children were exclusively fed with only spoon and cup. Among children who were exclusively breast fed, greater percentage of children were at moderate caries risk (68%) followed low caries risk (32%) and none were under high caries risk. While children who were followed only spoon and cup feeding method, majority (75%) of them were at high caries risk. Greater percentage of children (75%), who used spoon and cup for feeding were under high caries risk and children who were exclusively breast fed were under low risk (32%). Among the children who were only bottle fed (39.5%), more number of children were at moderate caries risk (28%) followed by high caries risk (12.5%) and low caries risk (5%) (Table 1).

Table 1: Type of feeding pattern in children with cleft lip and palate being followed

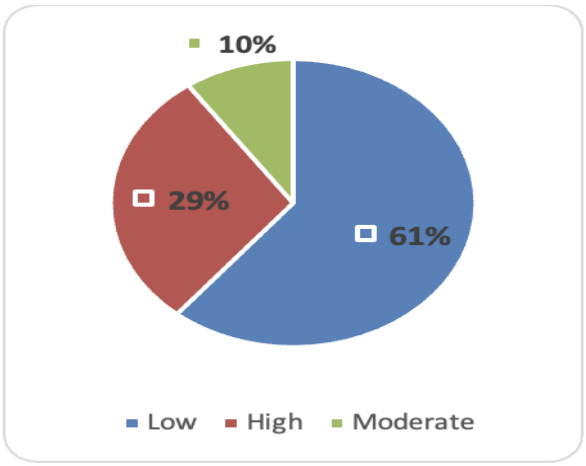
Type of Feeding	Percentage (%)	Low caries risk	Moderate caries risk	High caries risk
Only breast feeding	17	32%	68%	0%
Only bottle feeding	39.5	5%	28%	12.5%
Breast and bottle feeding	18.9	23%	8%	12.5%
Spoon and cup	24.5	24.3%	8.3%	75%

Duration of feeding is an important parameter associated with caries. But in the present study, duration of feeding did not influence caries. Most of the mothers fed their child for less than 10 min. Mothers, though majority being illiterate were well aware about the negative effects of night feeding. None of the children faced any significant weight loss during their infancy due to feeding difficulties.

Of the total study sample (n=100), only 23% of mothers used modified bottle to feed their child (Graph1). Among these, 61% of children who were fed with modified bottles were at low risk of caries, 10% were at moderate risk and 29% were at high risk of caries (Graph 2).



Graph 2-Prevalence of caries in infants who were not fed with modified bottles



Graph 1- Use of Modified Bottle

All the children who were fed with modified bottle were caries free showing direct relationship between use of modified bottles and caries risk. 29% of children who were not fed with modified bottles were under high caries risk.

Discussion:

A child with complete cleft of lip and palate always exhibit a significant health burden, though generally not life threatening as it causes a considerable functional inefficiency such as restricted maxillofacial growth, speech anomalies, swallowing and feeding difficulties, hearing loss and/or recurrent ear infections etc.[4] The feeding difficulties in infants with cleft lip and/or palate are well documented; as many as 63% of them experience such difficulties and most of these relate to compromised sucking efficiency. There are various alternatives feeding methods recommended in the literature for successful feeding in children with cleft lip and palate. The form and pattern of infant feeding in the etiology of early childhood caries is of interest. Infant-feeding practices, including those occurring before or

contemporaneously with tooth eruption, could plausibly impact future caries risk by at least two possible pathways. Firstly, early infancy is a critical period in which experiences with various foods and tastes importantly influence food preferences and behaviors later in childhood. Secondly, early dietary patterns may influence bacterial ecology, such as establishment of *mutans* Streptococci, a strong predictor of future caries incidence in young children.White et al(1992) reported that 80% of mothers who chose to breast feed do so because they believe it is in the best interests of their baby.[5] In spite of these beliefs, there is paucity of evidence in the literature to suggest that anything other than bottle feeding is appropriate for the cleft child.(Kelly,1971[6]; Pashayan and McNab,1979[7]; Jones et al.1988[8];Choi et al.1991[9]; Brine et al.1994[10];Trenouth and Campbell,1996[11]), although Clarren et al.(1987)[12] tailor feeding methods and shape and size of the nipple to the type of the cleft defect. In the present study,17% of children were breast fed, 39.6% were bottle fed with regular bottle only, 18.9% of children fed were with both breast and bottle and 24.5% of children were exclusively fed with only spoon and cup.

Styer & Freeh found many infants took from 45to 90 minutes to feed. Although 12 of the 25 mothers had tried to breastfeed their babies, none was successful.[13] Of 350 neonates, only those with cleft lip (but not cleft palate) could breast-feed to an extent that was adequate to achieve normal weight gain. Jones In the present study, duration of feeding did not influence caries risk.Most health care workers agree that breast feeding is beneficial for both infant with cleft lip and mother. But there was no data in the literature mentioning the actual feeding method practiced by the parents of such children and to suggest that anything other than breast feeding is appropriate for cleft child. Breast milk may confer some protection against otitis media and is linked to higher scores on intelligence tests and language development. Darzi *et al*., in a prospective randomized trial, showed that early postoperative breast feeding after cleft lip repair is safe, results in more weight gain at 6 weeks after surgery, and is more economical than spoon feeding or modified bottle feeding.[14] In this present study, only 17% of the children were breast fed before/after the lip repair and none of them were under high caries risk group.According to Mian AH et al. (2005)[15]number of children with caries increased with age; it was 13.6% at the age of 12– 23 months, 44.4% at the age of 24–35 months, and all cleft children over 36 months of age had caries.In this present study also number of children with caries increased with age; it was 10.5% upto age to 3 years of age and 82.3% at the age of 3-6 years.As feeding is an immediate problem for newborn babies with cleft lip and palate, many feeding methods have been recommended in the literature. Some authors have presented short catalogues of feeding equipment or techniques that may help infants with clefts and others have advocated specific feeders for use in some or all cleft conditions. Compressible (squeezable) plastic feeding bottles with narrow, long, cross-cut nipples have also been used with considerable success.[16] Gentle squeezing of the plastic bottle forces formula from the tip of the nipple, avoiding the necessity of the negative pressure created by sucking.

The Haberman feeder® is commonly used in the United States,[17] and a type-P nipple and a Y-cut nipple with a long and wide shaft have been used widely in Japan.[18]Cup and Spoon feeding is found as a common feeding practice amongst parents of children with CLP.[19] In this present study, 75% of children who were under high caries risk group were fed with spoon and cup. Children fed with a spoon were more irritable, required more analgesic drugs or sedation, and had higher hospital costs.[5] A similar study assessing bottle and spoon *vs*. spoon feeding after lip repair showed very similar results between the groups; however, there was greater acceptance of feeding in the group using the bottle and the spoon.[20]

Conclusion:

Within the limitations of the present study, children with cleft lip and palate who were milk fed using modified bottles found to at low caries risk than who were breastfed. However, duration of the feeding using either of the methods did not influence the caries risk in these children. The knowledge of mothers of these cleft lip and palate children, regarding feeding practices was observed to be satisfactory.

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