

## Evaluation of Feeding Practice in Infants with Cleft Lip and Palate at Cleft Centers

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### Abstract

**Background:** Orofacial clefts are one of the prevalent congenital anomalies affecting infants.

**Aim:** To evaluate the feeding practice in infants with cleft lip and palate at four different cleft centers.

**Material and Method:** A total of 136 infants of less than 2 years of age with Cleft lip, Cleft palate, Cleft lip and palate, Small notch on lip, Split Uvula were included in the study. These subjects were divided into three groups, according to the chronological age as birth to 6 months, 6 months to 1 year and 1 to 2 years. The parents of the infants with cleft lip and palate were interviewed regarding feeding practice using a pre-validated questionnaire.

**Results:** Sangu/Paladai (an indigenous baby feeding cup) was the most common feeding method practiced. Of the parents, 86% were feeding at a frequency of every 2 hours and 94.85% of the parents followed this practice of feeding in an upright position. The most common difficulty faced during this practice was nasal regurgitation. Further, 12.7% of the parents were aware of the feeding plate while about 20.6% of the parents used the feeding plate. This feeding plate, however, was advised only at a few centers and 9.6% of all the parents were rather referred to a pediatric dentist.

**Conclusion:** From the study it was concluded that, the most common feeding method practiced by the parents of cleft lip and palate infants at cleft centers as per the suggestion of Sangu/Paladai. This practice was followed at a frequency of every 2 hours in an upright position. Overall, a lack of knowledge regarding the feeding plate and referral to the pediatric dentist was observed.

**Keywords:** Cleft Lip and Palate; Feeding Difficulties; Multidisciplinary Cleft Team; Pediatric Dentist; Feeding Plate

### Introduction

During the initial few weeks, new-born infants receive the maximum feeding while sleeping. This nature of feeding is not only required for the satisfaction of hunger and thirst of an infant but also provides psychological interaction with the mother and allows a bonding between them [1]. The sucking reflexes generate a negative intraoral pressure through the use of continuous intraoral muscular movements

while the infant is fed. However, in cleft abnormalities, this interrelated mechanism is interrupted and feeding in this way does not work [2,3]. Orofacial clefts are one of the prevalent congenital anomalies affecting infants. The rate of incidence of this anomaly varies from 0.28 to 3.74 per 1000 live births. Various types of cleft abnormalities have been recognized, which differ on the basis of involvement of different regions of the orofacial complex, ranging from a slight notch in the lip to a total disunion; these can either be “unilateral clefts” or “bilateral clefts”. Therefore, the management of clefts of the oro-facial region needs a multidisciplinary approach [4,5]. The etiological variations in oro-facial clefts are caused by both, the hereditary variations and external factors [6].

The emotional feelings of a mother, who delivers an infant with cleft abnormalities, are characterized with a mixture of grief, depression, and overpowering guilt, hence they are in an immediate need of counseling to help them overcome these attitudes by a multidisciplinary team. This is beneficial for the parents as well as their infant. Feeding an infant with CL/P and training the mother are significantly major tasks and this management requires a multidisciplinary approach, in addition to psychic support and professional supervision [7]. Many studies have reported that mortality of the infants with cleft palate occurred due to malnutrition since the infants were unable to suck due to the reduced sucking efficiency [2,3]. Similarly, many other difficulties have been observed to be encountered by cleft infants, such as inadequate suction, uncontrolled air intake, gasping, nasal regurgitation, failure to gain adequate weight, and longer time required to feed [3]. A few other complications faced by such infants are conductive hearing loss due to acute otitis media and reinfection of the middle ear, improper speech due to change in intraoral anatomy, disproportion in arch relationship due to altered growth of dental arches and mal-positioned teeth, and a high risk of dental caries [8]. The primary issue requiring an immediate attention for an infant with a CL/P is a pediatric review because feeding the infant is more important in order to conserve adequate nutritional intake as compared to an immediate orthodontic or surgical solution [9]. The pediatric dentists thus play a significant role in such patients right from infancy through adulthood, and about 92% of the organizations include a pediatric dentist in the multidisciplinary cleft palate team with duties extending from preventive and restorative approaches to infant orthopaedics [10].

Feeding goals of normal and CL/P infants are similar, in which, sustained nutrition is the first concern, followed by practicing a feeding technique as close to normal as possible. Therefore, this study was performed with an aim of evaluating the feeding practice in infants with CL/P at four different cleft centers.

**Materials and Methods**

A total of 136 infants of less than 2 years of age with Cleft lip, Cleft palate, Cleft lip and palate, Small notch on lip, Split Uvula were included in this study. Syndromic cleft infants were excluded from the study. These subjects were divided into three groups according to the chronological age of the infants with Cleft lip and palate, such as birth to 6 months, 6 months to 1 year, and 1 to 2 years as shown in table 1. All the study subjects were selected from the inpatient department, where the patients were admitted at the cleft centers for surgical treatment. Meenakshi Ammal Dental College and General Hospital (Swiss cleft center), Balaji Dental and Craniofacial Hospital, Christian Mission College (Smile train cleft center) and Meenakshi Mission Hospital and Research center (Smile train cleft center) were the four cleft centers included in the study. The parents of the infants with CL/P were interviewed and the details regarding the feeding practice were recorded on a standard proforma (Figure 1) that included name, age, sex, present feeding method practiced at centers, the frequency of feeding, the position of feeding, parental awareness regarding the feeding plate, and referral to the pediatric dentist.

| SL. No | Age                | Subjects (N) | Percent (%) |
|--------|--------------------|--------------|-------------|
| 1.     | Below 6 months     | 60           | 44.11       |
| 2.     | 6 months - 1 Years | 60           | 44.11       |
| 3.     | 1-2 Years          | 16           | 11.76       |
|        | Total              | 136          | 100.0       |

**Table 1:** Distribution of the infant patients with cleft based on age.

**EVALUATION OF FEEDING PRACTICE IN INFANTS WITH CLEFT LIP AND PALATE AT CLEFT CENTERS**

|                           |          |                    |  |
|---------------------------|----------|--------------------|--|
| Name of the cleft center: |          | Patient serial no: |  |
| Patient name:             | Age/Sex: | Birth order:       |  |

- Type of the Cleft:
  - Cleft Lip only
  - Small notch on lip
  - Split Uvula
  - Cleft Palate only
  - Both cleft lip & palate
- Feeding practiced for the infants with cleft at cleft centers?
 

Spoon  Sangu  Dropper  Glass  Syringe

Breast  Bottle with Y-cut Nipple  Any other method
- Duration of feeding followed:
 

Every hour  Every 2 hour
- Difficulties in feeding the child from mother's view:
 

Yes  No
- If yes Specify the difficulties,
 

Nasal regurgitation  Vomiting on Burping  Unable to breast feed

Often cold
- Parental Awareness about the feeding plate:
 

Yes  No
- Have referred to Pedodontist?
 

Yes  No
- Present method of feeding used?
 

With feeding plate  Without feeding plate
- Position of child while feeding?
 

Upright  Semisitting  Lie on lap

**Figure 1:** Standard Protocol Questionnaire.

### Statistical analysis

The data were entered on a master sheet and recorded on a standard proforma. The chi-square test was applied to identify any statistical significance in the feeding practice in infants with CL/P at the cleft centers.

### Results

The most common feeding method practiced, among all the subjects (N = 136), was Sangu/Paladai followed by spoon feeding which was found to be statistically significant at < 0.001. Of all of the parents, 94 practiced Sangu/Paladai while 17 practiced spoon feeding. A few infants were also fed by dropper, the bottle having a y-cut syringe, and glass; breastfeeding was also encouraged at few centers (Table 2). About 86% of the parents reported that feeding method was practiced every 2 hours (Table 3). Regarding the position of the child while feeding 94.85% of the parents followed the upright position (Table 4). Among all the subjects, 64.70% (N = 136) of the parents reported difficulties in feeding the cleft child (Table 5). Nasal regurgitation was the major difficulty reported by about 60.22% (N = 88) of the subjects (Table 6). In a few cases vomiting on burping and inability to breastfeed the child were reported. About 12.7% of the parents were aware of the feeding plate (Table 7). Around 20.6% of the study subjects used the feeding plate, which was advised at a few cleft centers (Table 8). About 9.6% of all the parents were referred to a pediatric dentist (Table 9).

| Age                | Feeding method followed for the patient with Cleft |                   |         |                             |       |         |        |       | P- Value               |
|--------------------|--|-------------------|---------|-----------------------------|-------|---------|--------|-------|------------------------|
|                    | Spoon  | Sangu/<br>Paladai | Dropper | Bottle with<br>Y-cut nipple | Glass | Syringe | Breast | Total |                        |
| Below 6 months     | 6  | 45                | 1       | 1                           | 1     | 4       | 2      | 60    | 0.001<br>(Significant) |
| 6 months - 1 Years | 10   | 43                | 0       | 0                           | 4     | 3       | 0      | 60    |                        |
| 1-2 Years          | 1  | 6                 | 2       | 2                           | 3     | 1       | 1      | 16    |                        |
| Total              | 17   | 94                | 3       | 3                           | 8     | 8       | 3      | 136   |                        |

**Table 2:** Age Vs Feeding method followed for the infant patients with Cleft at cleft centers.

| Feeding duration | Subjects (N) | Percent (%) |
|------------------|--------------|-------------|
| Every hour       | 19           | 14.0        |
| Every 2 hours    | 117          | 86.0        |
| Total            | 136          | 100.0       |

**Table 3:** Duration of feeding.

| Position    | Subjects (N) | Percent (%) |
|-------------|--------------|-------------|
| Upright     | 129          | 94.85       |
| Semisitting | 5            | 3.6         |
| Lie on lap  | 2            | 1.47        |
| Total       | 136          | 100.0       |

**Table 4:** Position of child while feeding.

| Problems in Feeding | Subjects (N) | Percent (%) |
|---------------------|--------------|-------------|
| Yes                 | 88           | 64.70       |
| No                  | 48           | 35.29       |
| Total               | 136          | 100.0       |

**Table 5:** Difficulties in feeding the child from mother’s view.

| Difficulties          | Subjects (N) | Percent (%) |
|-----------------------|--------------|-------------|
| Nasal regurgitation   | 53           | 60.22       |
| Often cold            | 8            | 9.09        |
| Vomiting on Burping   | 20           | 22.72       |
| Unable to breast feed | 7            | 7.95        |

**Table 6:** Type of Difficulties in feeding the cleft lip and palate child.

| Parental Awareness | Subjects (N) | Percent (%) |
|--------------------|--------------|-------------|
| Yes                | 17           | 12.5        |
| No                 | 119          | 87.5        |
| Total              | 136          | 100.0       |

**Table 7:** Parental Awareness about the feeding plate.

| Feeding used          | Subjects (N) | Percent (%) |
|-----------------------|--------------|-------------|
| With feeding plate    | 28           | 20.6        |
| Without feeding plate | 108          | 79.4        |
| Total                 | 136          | 100.0       |

**Table 8:** Present method of feeding used with and without feeding plate.

| Visited Pediatric dentist | Subjects (N) | Percent (%) |
|---------------------------|--------------|-------------|
| Yes                       | 13           | 9.6         |
| No                        | 123          | 90.4        |
| Total                     | 136          | 100.0       |

**Table 9:** Referral to Pediatric dentist.

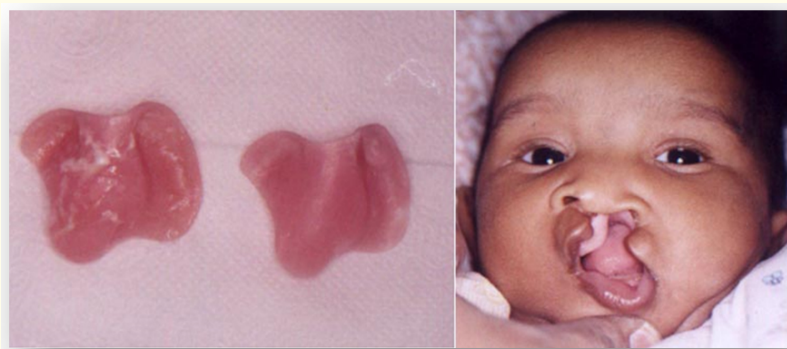
**Discussion**

The knowledge and awareness about the feeding methods for infants with CL/P are very important for new expectant mothers and inexperienced maternity staff [11]. Prenatal education plays a key role in the dental care of the infants as the expectant mothers serve as a role model for their children. Even though the mothers are encouraged and motivated to breastfeed the infant, most parents follow the method best adapted to their baby by carrying out a trial and error activity. The most common feeding difficulty encountered by a CL/P infant is the inability to suck milk as the desired continuous intraoral muscular movements and effective negative pressure are not achieved in such cases. In the present study, the difficulties posed while feeding a cleft child from mother’s point of view and was about 64.5% of the mothers reported nasal regurgitation as the major difficulty while a few others reported vomiting on burping and inability to breast-feed the child as the major concerns. These results are in line with other studies reporting vomiting as a difficulty during feeding [12]. Since feeding is the foremost problem encountered by these infants, many feeding methods have been recommended in the literature such as the Haberman feeder, a type-P nipple, nipples with a Y-cut at the end and a long and wide shaft, and valvular pressure-controlled feeding bottles [13]. Yet, most of these devices are not available in our country due to the lack of awareness and cost-effectiveness [14]. In terms of the feeding methods practiced by the mothers and the duration and position of feeding (Figure 2) illustrates that at most of the centers, the mothers were advised to express breast milk under sterile conditions and feed the child through Sangu/Paladai [an indigenous baby feeding cup] at a frequency of every 2 hours in an upright position. These results regarding the upright positioning of the infants while feeding were found to be in line with another study done by Cooper-Brown L., *et al.* and Devi SE., *et al* [15,16]. The second most commonly used method includes spoon feeding and this finding concords with that of Goyal., *et al.* and Pandey P and Singh [17,18]. Few mothers practiced feeding dropper, bottle with a Y-cut syringe, and a glass as well. Breastfeeding was also encouraged at a few centers. The present study illustrates that only about 12.7% of the parents had the awareness about the feeding plate and nearly 20.6% of all the subjects used feeding plate, which was advised at few cleft centers. Some authors have reported that the use of feeding tube during early life results in soft tissue perforation; therefore, considering these complications, an intact and least invasive method must be

devised for the long-term use in children with orofacial clefts [19]. The orthopedic plate is fabricated such that it adapts to the cleft in the alveolus and palate, thus and closing off the nasal cavity from the oral cavity resulting in an enhancement of increased intraoral negative pressure by sucking. However, according to some studies, the intraoral negative pressure produced by the use of a feeding plate is not effective as it is unable to seal the alveolus, palate, or velopharynx completely [4,10]. Another study demonstrated that the width of the cleft was decreased significantly in the feeding plate group as compared to that in the control group [3]. Though the feeding plate does not produce adequate negative pressure in the oral cavity, yet it is clear from the studies mentioned above that the feeding plate helps in providing rigid intermediate platform against which the child can suck, resulting in a complete oral seal and also prevents widening of the clefts by the downward positioning of the tongue and contributes to the enhancement of speech along with lowering the recurrent risk of infection in the nasopharyngeal area. These appliances also help in orthopedic shaping of the cleft segments and an approximation of the arches, along with maintaining a good maxillary cross arch strength; they also block the arches from collapsing after surgical union of the lip [3,20]. Hence, many cleft rehabilitation centers recommend the use of feeding plates in infants with complete unilateral/bilateral clefts as shown in figure 3.



**Figure 2:** Mother feeding with Sangu/Paladai in cleft lip and palate infant at cleft center.



**Figure 3:** Feeding plate.

The major limitations of this fabricated feeding plate are the repeated requirement of the new plate so as to support the growth and development of the arches as well as for the maintenance of good oral hygiene which may not be attained otherwise. Some centers recommend the use of prosthetic palatal obturator in order to attain a good palatal seal for generating an effective negative oral pressure, but due to poor oral hygiene, it results in fungal growth on the palate when cleaning of the appliance is not properly practiced by the mothers. Therefore, an alternative approach for the use of feeding plates is to modify the standard feeding techniques by an upright positioning of the baby's head or by using cups and spoons, or by using a range of modified teats [21]. The present study revealed that only about 9.6% of the subjects were referred to a pediatric dentist (Table 9). The pediatric dentists observe the infant right from infancy to adulthood, and also enables the integration of oral hygiene and dental prophylactic regimens into the treatment protocol for these infants in addition to the goal of establishing a desirable preliminary oral health along with the intervention of radical corrective surgery and complex dental treatment [22,23]. In non-syndromic cleft infants, an early intervention and management are necessary because they influence the quality of life in children once they are in a school-age group and also to reduce the complications by increasing body mass and decreasing the risk during surgery due to poor health [24].

## Conclusion

Sangu/Paladai was found to be the most common feeding method practiced at cleft centers, at a frequency of every 2 hours in an upright position. Nasal regurgitation was reported to be the most common feeding difficulty encountered. According to the statistical data obtained in this study, there was a paucity of knowledge in parents regarding the parental awareness about the feeding plate and the referral to a pediatric dentist.

## Recommendations

The multidisciplinary cleft team centers should promote further educational programs and provide optimal delivery of comprehensive dental care that offers the best cure of the infants with cleft lip and palate.

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