Comparison of Feeding Behaviours in Term Infants and Preterm Infants (30 To 34 Weeks) at Six Months Corrected Age

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Abstract

Feeding is explained as the placement, manipulation and mastication of food in the oral cavity prior to initiation of the swallow. In infants, feeding is considered as innate behaviour. Literature provides evidences connecting successful feeding as a predictor for normal communication. This study aimed at comparing the feeding behaviours of term and preterm infants (30 to 34 weeks) at six months corrected age. A questionnaire was developed based on milestones on feeding development. This consisted information on mode of feeding, difficulties in feeding and feeding behaviour. The questionnaire was administered on parents of 50 infants (25 term and 25 preterm infants). Significant difference in feeding behaviour was observed between the term and preterm infants at six months of age. This long term feeding difficulty may be pronounced during the transitional feeding. Hence the need for Speech Language Pathologist to evaluate feeding behaviour at transitional period for preterm infants becomes necessary.

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Introduction

The feeding and swallowing is a complex process controlled neuro-physiologically[1]. For normal feeding skills development, the coordination of the motor and sensory functions are essential. Prerequisites for successful feeding include oro-motor skills, oral sensitivity, reflexes related to swallowing and Coordination of sucking, swallowing and breathing. Preterm infants are stated as, those infants born below 37 weeks of gestation[2]. These skills may be affected in preterm infants. The neurological, feeding, respiratory abnormalities may be predicted by coordination of suck-swallow patterns and swallow-respiration[2]. In preterm infants, feeding disorders are extremely common due to disorganized or weak oral movements, hypotonia, lack of arousal and irritability, behavioural disorganization, presence of assistive ventilation devices or poor endurance[3]. Oral difficulties are frequent in preterm infants due to their underdeveloped cardiorespiratory system, central nervous system and oral musculature[4]. The preterm infants who are born before three weeks than term should be weaned between four and seven months or at six months of age[5]. It is also reported that feeding problems are common in preterm infants at first year of life[6]. During the phase of feeding development infants are fed with foods with various consistency using different modes. Evidences provide that feeding and pre-speech vocalizations have been assumed to be manifestation of neurological manifestation of the infant. Early vocalization that is speech has thought to be influenced by the infant's feeding pattern[7]. The speech and normal feeding depends on several factors such as; liptone, rhythm, Breath control, finely coordinated tongue movements, well developed sensory feedback systems and speed of the muscle movements. These evidences deliver the connection between successful feeding as a predictor for normal communication[8]. These studies provide us knowledge that Speech Language Pathologist has a remarkable role in assessing these skills among children.

Hence the present study aimed to compare feeding behaviour in term and preterm infants (30 to 34 weeks of GA) at six months of age to understand the presence of feeding difficulties around transitional feeding.

Materials and Methods

Parents of 25 pre-term and 25 term infants participated in this study. The participants were included based on following inclusion and exclusion criteria:

Inclusion criteria for preterm infants

1. Preterm infants at 30- 34 weeks of gestational age.
2. Infants who are appropriate for gestational age (AGA).
3. Infants without craniofacial abnormality.

Inclusion criteria for term infants

1. Infants without craniofacial abnormality
2. Normal birth weight
3. Nil co-existing neurological, cardiology or any vital organ issues

The study was carried in two phases:-

During the first phase a questionnaire was devised in English based on the literature. The paediatrician verified the questions and its applicability to assess the development and growth of the child. The nutritionist reviewed the questionnaire with respect to the texture and nutritional aspect in Indian context. Two speech language pathologists viewed the questionnaire to ensure the appropriateness of feeding behaviour of these infants. The questionnaire consisted of demographic details, feeding history, current feeding status of the infants and 14 closed ended questions under following domain viz. age at which puree feeding was initiated, current feeding behaviour, feeding difficulties in infants and duration of feeding.

In the second phase, the questionnaire was administered on parents of 25 term and 25 preterm infants after obtaining an informed consent. These individuals were identified with help of the previous hospital records. The examiner selected those infants who had met the inclusion and the exclusion criteria. Followed by the examiner contacted the parents/ guardians of these infants. For the study the examiner used percentage analysis and Pearson chi-square (χ^2) analysis.

This study adhered to the guidelines of Indian Council of Medical Research (ICMR) and was approved by the Internal Ethics committee and the Publication oversight committee (POC) of the University.

Results

Modes of feeding

History of feeding in these infants was recorded. There were three modes through which the preterm and term infants were fed. These were nasogastric tube feeding, paladai feeding and direct breast feeding.

Table 1: History of mode of feeding in term and preterm infants

Modes	Term infants (n)	Preterm infants (n)
Nasogastric tube feeding	0	17
Paladai feeding	2	15
Direct breast feeding	23	8

The study revealed that, none of the term infants had history of NG tube feeding whereas 17 preterm infants were fed through NG tube feeding. Two mothers reported to have difficulty in lactation through breast feeding. Hence these infants were fed through paladai mode followed by direct breast feeding. It was observed that direct breast feeding was initiated for 23 term infants and only 8 preterm infants.

Duration of practice

The duration of practice of feeding modes include; history of nasogastric tube feeding, paladai feeding and direct feeding.

a) Nasogastric tube feeding
b) Paladai feeding
c) Direct breast feeding

Table 2: Percentage analysis, chi-square (χ^2) value and significance (p) value on the practice of nasogastric tube feeding for above 1 week and less than 1 week in term and preterm infants

NG tube feeding		Term infants (%)	Preterm infants (%)	χ^2	*p*- value
>1 week	Required	0	44	11.65	0.0006**
	Not required	100	56		
< 1 week	Required	0	24	4.73	0.029*
	Not required	100	76		

Significant * at $p < 0.05$, significant ** at $p < 0.01$

Table 3: Percentage analysis, chi-square (χ2) value and significance (p) value on the practice of paladai feeding for above 1 week and less than 1 week in term and preterm infants

Paladai feeding		Term infants	Preterm infants	χ^2	*p*- value
>1 week	Required	0	24	4.73	0.029**
	Not required	100	76		
< 1 week	Required	8	36	4.19	0.04*
	Not required	92	64		

Significant * at $p < 0.05$, significant

Table 4: Percentage analysis, chi-square (χ2) value and significance (p) value for direct breast feeding in terms and preterm infants.

Direct breast feeding	Term infants (%)	Preterm infants (%)	χ^2	*p*- value
Initiated	92	32	19.1	0.00001**
Not initiated	8	68		

** significant at 0.01

Table 5: Percentage analysis, chi- square (χ^2) value and significance (p) value on questions like cough while giving puree, vomiting during/ while puree feeding, spitting during feeding and frequency of feeding among preterm preterm infants.

Feeding behaviour	Number of preterm infants (in %)	Number of term infants (in %)	Significant** at *p*< 0.01
Cough while giving puree	52%	16%	0.004
Vomiting during/ while puree feeding	64%	16%	0.001
Spitting during feeding	52%	8%	0.0009
Frequency of feeding (every 2 hours)	60%	20%	0.009

On analysing the data it was noted that there were significant difference between term and preterm infants at six months of age on following behaviours.

Discussion

The study aimed to study compare feeding behaviours in term infants and preterm infants (30 to 34 weeks) at six months corrected age. Based on the above results we have discussed our findings under following domains.

History of modes of feeding: The infants were fed through different modes. Nasogastric tube feeding are required for preterm infants since these may have poor suck swallow coordination, it tis then practiced until the suck swallow coordination is achieved[2]. Literature does also reveal that nasogastric tube feeding is initiated for preterm infants born between 30 and 34 weeks of gestational age[9].

Paladai feeding is also considered as a form of cup feeding. In India paladai feeding is used to feed premature infants. Paladai feeding is initiated on following reasons[10]:

1. When the infant is unable to latch on the breast for any reason
2. When the mother is unavailable during the neonatal period
3. When breast feeding is not possible for any reason.

In the present study two term infants were fed through paladai mode because the mothers had difficulty during breast feeding.

The study aimed to study compare feeding behaviours in term infants and preterm infants (30 to 34 weeks) at six months corrected age. Based on the above results we have discussed our findings under following domains.

Cough while giving puree: Change in the texture of food during the transitional feeding may contribute to the cough during feeding. The infant may not suck and swallow as the way they used to perform before. This may lead to cough, splutter or spit the food. This behaviour could be attributed to the infants who are still learning to use the lingual and buccal muscles[11].

The present study shows that preterm infants have more occurrence of cough during pureed feeding than term infants than the term infants

Vomiting during/ while puree feeding: By around 6 to 12 months children with sensory food aversions becomes more symptomatic and these sensory aversions include spitting, vomiting and gagging[12]. It is also described that during breast feeding the infants, mothers should "kick out" the swallowed air. This release of the swallowed air is characterized by *burping.* Any failure in this act may lead to regurgitation, vomiting and abdominal pain. Similar findings are documented where vomiting is contributed to GERD found in infants born prematurely and infants or children with concomitant medical disorders[13].

Spitting during puree feeding: When the food is introduced to infants at early stages of transitional feeding, they may splutter, spit out food, cough[13] and/ or turn away or bat it away with the hands due to changes in sensation[14]. It is also reported that sensory food aversion is one of the most common feeding disorders during the first three years of life[14].

Frequency of feeding: Term infants indicate hunger and have supportive feeding reflexes. But for the preterm infant, the central nervous system doesn't indicate hunger. This might lead the mothers of the term infant to feed infants more frequently[15].

Conclusion

In conclusion, preterm infants when compared to the term infants had certain issues in feeding. This could be attributed to long term NG tube feeding and co-existing medical conditions. This long term feeding difficulty may be more pronounced during the transitional feeding. Hence it is necessary for a Speech Language Pathologist to evaluate feeding behaviour at transitional period for preterm infants.

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