INTERNATIONAL JOURNAL OF CURRENT MEDICAL AND PHARMACEUTICAL RESEARCH
ISSN: 2395-6429, Impact Factor: 4.656
Available Online at www.journalcmpr.com
Volume 6; Issue 01(A); January 2020; Page No. 4873-4875
DOI: http://dx.doi.org/10.24327/23956429.ijcmpr202001822

Research Article

EFFECT OF AN ORAL STIMULATION PROGRAM ON ORAL FEEDING AMONG PRETERM INFANTS: A RANDOMIZED CONTROLLED TRIAL

Archana Singh[1], Dr. P. Vetriselvi[2*] and Dr. Nishad Plakkal[3]

[1]M.Sc. Paediatric Nursing student, College of Nursing, JIPMER
[2]Assisstant Professor, College of Nursing, JIPMER
[3]Associate Professor, Department of Neonatology, JIPMER

ARTICLE INFO

Article History:
Received 15th October, 2019
Received in revised form 7th November, 2019
Accepted 13th December, 2019
Published online 28th January, 2020

Key words:
Preterm infant, oral stimulation program, transition time, volume of feed.

ABSTRACT

Introduction: Direct breast feeding is limited in preterm infants because of immature oral musculature, illnesses like gastrointestinal reflux, gut immaturity which can lead to aspiration, inadequate sucking-swallowing and breathing coordination. Oral stimulation program will improve the oral musculature and movement which will enhance normal oromotor development and sucking patterns. The objective of the study is to assess the effect of an oral stimulation program on transition time from nasogastric tube feed to full paladai feed and volume of feed.
Materials and methods: A randomized controlled trial was adopted for this study. A simple random sampling technique was used to select thirty-six preterm infants who were randomized into two groups (18 in each). The instrument used for the study was a data collection proforma including demographic and clinical variables which was developed by the investigator with inputs from the experts. The preterm infants in experimental group received oral stimulation program for 12 minutes before nasogastric tube feed 3 times a day for 7 consecutive days. The outcome was assessed by the investigator on seventh day of the oral stimulation program. **Result:** The comparison of mean scores of transition time from nasogastric tube feed to full paladai feed in experimental group is 7.22 + 0.428 and that of control group is 9.11 + 1.079 and significant at 0.001 level and mean scores of volume of feed in experimental group is 6.22 + 1.114 and that of control group is 3.11 + 0.583 and significant at 0.001 level. **Conclusion:** The study concluded that an oral stimulation program is an effective intervention in preterm in reducing the transition time from nasogastric tube feed to full paladai feed and also increased the volume of feed taken by the preterm.

INTRODUCTION

Preterm birth is defined as delivery of a baby before 37 completed weeks of gestation.[1] The main problems faced by the preterm infants are feeding problems and poor weight gain due to immature suck, swallow, breathing coordination.[2]

In preterm infants, oral stimulation program improves the oral muscles and movement which will enhance normal oromotor developmental patterns and sucking reflexes.[3] Normal oral feeding is an important outcome to measure neuromotor coordination, and developmental patterns among preterm infants.[4] In preterm infants, direct breast feeding is limited because of underdeveloped oral muscles, problems like gastrointestinal reflux diseases, immature gut, which can lead to aspiration, inadequate sucking-swallowing and breathing coordination. So, the main goal is to achieve a safe, successful, independent oral feeding among preterm infants either through paladai or direct breast feeding by implementing oral stimulation program. Oral stimulation program will help in reducing the transition time from nasogastric tube feed to full paladai feed and ultimately will improve the oral-muscles and sucking patterns among the preterm infants.[5]

Preterm infants usually lose weight during the first week of life. After 5-6 days they start to regain weight, but if they have not regain weight it may lead to many health issues. Hence oral stimulation programme is needed to improve their sucking pattern.[6] preterm infants faces many problems related to feeding and it is not rectified earlier it may contribute longer hospital stay.[7] The feeding problems are mainly due to immature suck-swallow-breathing coordination.8.feeding problems are associated with early hypotonia and hypotonia may hamper the oromotor skills and sucking patterns among preterm infants.[9]

Oral stimulation program is a feasible and cost-effective method to improve the sucking patterns among preterm infants. On the other side it will help in increasing weight, will decrease length of hospital stay and will improve mother baby bonding and attachment. So, the babies can be shifted from nasogastric tube feed to full paladai feed or direct breast feed soon.

MATERIALS AND METHODS

This Randomized controlled trial was carried out after formal approval from the Institution Ethics Committee (Human studies) of Jawaharlal Institute of Postgraduate Medical

Corresponding author:* **Dr. P. Vetriselvi
Assistant Professor, College of Nursing, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), India

Education and Research (JIPMER). The sample consisted of 36 preterm infants who were born between 28-34 weeks of gestation, with stable vital signs and received tube feed. The exclusion criteria included the infants who had undergone surgery, or with any congenital anomalies or who were critically ill.

The data collection proforma comprised of sample number, date of admission, age of the preterm infant in days, gender, birth gestational age, birth weight, current weight, Apgar score at 5 minutes, date of initiation of oral stimulation program, date of initiation of partial paladai feed and volume of feed, date of initiation of full paladai feed, transition time from nasogastric tube feed to full paladai feed, date of discharge, weight of the baby at the time of discharge, length of hospital stay .

The intervention involved in the study was oral stimulation. oral stimulation was done three times a day before nasogastric tubefeed for seven consecutive days. Each time twelve minutes was spent. First four minutes for stroking cheeks, lips, jaw and tongue and next four minutes encouraged the infant to suck one ml syringe filled with some amount of expressed breast milk and final four minutes for rubbing the gums.

For experimental group, the infants received oral stimulation program. The infants had been given oral stimulation for 12 minutes before nasogastric tube feed (3 times a day) for 7 consecutive days. After providing oral stimulation program, on fifth day partial paladai feed, (50% of total volume of milk by paladai and 50% by nasogastric tube) was given and rate per minute (ml/minute) was calculated. The transition time from nasogastric tube feed to full paladai feed was noted by the investigator.

For control group, the infants received routine care provided by the clinician and Neonatal ICU nurses. The infants had participated for 7 consecutive days. On fifth day partial paladai feed, (50% of total volume of milk by paladai and 50% by nasogastric tube) was given and rate per minute (ml/minute) was calculated. The transition time from nasogastric tube feed to full paladai feed was noted by the investigator.

Statistical Analysis

The data collected from the subjects were transferred into Excel master sheet and analysed using statistical package for social sciences (SPSS) version 21. The distribution of data on categorical variables such as APGAR score, gender, etc. were expressed in terms of frequency and percentage. The distribution of data on continuous variables such as birth weight, transition time from nasogastric feed to full paladai feed, volume of feed, and duration of feeding were expressed in terms of mean with standard deviation . The comparison of continuous variables between the groups were carried out by using independent t test. All the statistical analysis was carried out at 5% level of significance.

RESULTS

The findings of the study were: with regard to the gender, 9 (50%) were males, 9 (50%) were females in experimental group and in that of control group, 10 (55.6%) were males, 8 (44.4%) were females. With regard to birth weight, 1 (5.6%) was extremely low birth weight, 6 (33.3%) were very low birth weight, 11 (61.1%) were low birth weight in experimental group and in that of control group, 2 (11.1%) were extremely low birth weight, 11 (61.1%) were very low birth weight, 5 (27.8%) were low birth weight,.. With regard to APGAR score at 5 minutes, 18 (100%) had normal in experimental group and in that of control group, 17 (94.4) had normal. The comparison of mean scores of transition time from nasogastric tube feed to full paladai feed in experimental group was 7.22 $\pm$ 0.428 and that of control group was 9.11 $\pm$ 1.079 and significant at 0.001 level.

Table 1 Comparison of transtition time and volume of feed between the groups

N = 36 (18 + 18)

Parameters	Experimental group (18)	Control group (18)	Statistical significance
	Mean $\pm$ Standard deviation	Mean $\pm$ Standard deviation	
Transition time from nasogastric tube feed to full paladai feed	7.22 $\pm$ 0.428	9.11 $\pm$ 1.079	t = -6.906 $p < 0.001^{***}$
Volume of feed	6.22 $\pm$ 1.114	3.11 $\pm$ 0.583	t = 10.495 $p < 0.001^{***}$

Table 2 Comparison of change in weight at the time of discharge between the groups

N = 36 (18+18)

Parameter	Group	N	Mean	Standard deviation	Statistical significance
Change in weight	Experimental group	18	0.320	0.211	t = 2.867 $p = 0.009^{**}$
	Control group	18	0.168	0.079	

P<0.01

Table 3 Comparison of length of hospital stay between the groups

N = 36 (18+18)

Parameter	Groups	N	Mean	Standard deviation	Statistical significance
Length of hospital stay	Experimental group	18	27.22	9.674	t = -7.381 p = .000***
	Control group	18	51.56	10.101	

P<0.01

DISCUSSION

In preterm infants independent and successful oral feeding is an ultimate goal to measure neuromotor integrity, developmental patterns, etc. Direct breast feeding is limited to these infants because of poor oromotor skills, gut immaturity, deficit sucking-swallowing and breathing coordination. So, the main goal is to achieve a safe, successful, independent oral feeding either through paladai or direct breast feeding. Hence the present study was done to assess the effect of an oral stimulation program on oral feeding among preterm infants. The investigator found that the oral stimulation program is an effective method in reducing the transition time from nasogastric tube feed to full paladai feed.

The study findings revealed that the mean scores of transition time from nasogastric tube feed to full paladai feed in experimental group is 7.22+_0.428 and that of control group is9.11+-1.079 and significant at0.001 level and mean scores of volume of feed in experimental group is 6.22+-1.114 and that of control group is 3.11+_0.583 and significant at 0.001 level.

A similar study conducted in a tertiary care teaching hospital over a period of 10 months. The result of the study showed that there was better feeding performance, shorter transition time to independent oral feeding, better weight gain and decreased the length of hospital stay in the intervention group ($p < 0.001$).[10] oral stimulation reduced the transition time to

independent oral feeding as compared to standard routine care, and no oral stimulation program.[11] A randomized controlled trial study to assess the effect of oromotor stimulation for transition from gavage to full oral feeding in preterm neonates was conducted at PGIMER, Chandigarh in a level III neonatal unit for 4 months. This study concluded that oromotor stimulation along with routine care (KMC) reduces the duration of gavage feeding in preterm neonates.[12] A similar study on oral motor intervention program showed reduction in transition time from nasogastric tube feed to independent oral feeding, decreased hospital stay days, increased feeding efficiency, and volume of milk.[13] A study was conducted to assess the result of an oral and sensory motor stimulation program on independent oral feeding, length of hospital stay days, and rate of weight gain among preterm infants in NICU at Valie Asr Hospital in Iran. This study concluded that the time to reach independent oral feeding among preterm infants is reduced due to the implementation of oral stimulation program.[14] A study was conducted to assess the effect of an early oral stimulation program on oral feeding of preterm infants at a level 3 NICU in Children's Hospital of Fudan University. The conclusion of the study showed that an early oral stimulation program is beneficial in preterm infants.[15] A randomized blinded, clinical trial study was undertaken to assess the effect of the premature infant oral motor intervention on feeding progression and length of stay in preterm infants in level 3 NICU. The study results showed that the infants who received oral motor stimulation had reached independent oral feeding 5 days earlier than the control group and were discharged 2.6 days earlier than controls and mean score noted in experimental group was (18.1) which was statistically lower than that of control group (23.4).[16] A crossover design study was undertaken to assess the effects of pre feeding oral stimulation on feeding performance of preterm infants. The study concluded that the oral stimulation had a modulating effect on the pre feeding states and increased feeding efficiency.[17] A randomized controlled study was conducted to assess the effect of oral stimulation program on sucking skill maturation of preterm infants. The result showed that the experimental group achieved full oral feeding 7 days earlier than the control group. The stimulation program enhanced the sucking reflexes which results in early independent oral feeding.[18]

CONCLUSION

This study adds one more piece of evidence that oral stimulation program is effective in enhancing the transition time from naso gastric tube feed to full paladai feed and improvement in weight gain. Hence this cost effective strategy should be included in the neonatal intensive care unit armamentarium.

References

1. Paul VK, Bagga A. Ghai essential paediatrics. 8th ed. New Delhi: CBS; 2013.
2. Guha DK. Guha's Neonatology principles and pracice. 3rd ed. New Delhi : Jaypee Brothers ; 2005.
3. Lau C. Deveopment of suck and swallow mechanisms in infants. Ann Nutr Metab. 2015; 66: 7 – 14.
4. Gallardo MAF, Contreras DPR, Keith JFV. Development of feeding skills in preterm infants : a critical literature review. Rev. CEFAC. 2017; 19 :4.
5. Crapnell TL, Rogers CE, Neil JJ, Inder TE, Woodward LJ, Pineda RG. Factors associated with feeding difficulties in the very preterm infant. Acta P aediatr. 2013; 102 : 539 – 45.
6. Kliegman, Stanton, Geme S, Schor, Behrman. Nelson Textbook of paediatrics. 19th ed. Philadelphia : Saunders ; 2011.
7. Asadollahpour F, Yadegari F, Soleimani F, Khalesi N, The effects of nonnutritive sucking and pre – feeding oral stimulation on time to achieve independent oral feeding for preterm infants. Iran J Pediatr. 2015; 25: 809.
8. Boiron M, Nobrega LD, Roux S, Henrot A, Saliba E. Effect of oral support on non – nutritive sucking and feeding performance in preterm infants. Dev Med Child Neural. 2007; 49: 439 – 44.
9. Bertoncelli N, Cuomo G, Cattani S, Mazzi C, Pugliese M, Coccolini E, *et al*. Oral Feeding competences of Health Preterm Infants : A Review. International Journal of Paediatrics. 2012; 12: 1 – 5.
10. . Thakkar PA, Rohit HR, Ranjan DR, Thakkar UP, Singh A. Effect of oral stimulation on feeding performance and weight gain in preterm neonates: a randomized controlled trial. Paediatr Int Child Health. 2018; 38: 181-86.
11. 11. Greene Z, O'Donnell CPF, Walshe M. Oral stimulation for promoting oral feeding in preterm infants. Cochrane Database of Systematic Reviews. 2016;1: 9.
12. 12. Bala P, Kaur R, Mukhopadhyay K, Kaur S. Oromotor stimulation for transition from gavage to full oral feeding in preterm neonates. Indian Pediatr. 2016; 53: 36-38.
13. Tian X, Yi LJ, Zhang L, Zhou JG, Ma L, Ou YX, *et al*. Oral motor intervention improved the oral feeding in preterm infants: Evidence based meta-analysis with trial sequential analysis. Medicine. 2015; 94: 1310.
14. Younesian S, Yadegari F, Soleimani F. Impact of Oral Sensory Motor Stimulation on Feeding Performance, Length of Hospital Stay, and Weight Gain of Preterm Infants in NICU. Iran Red Crescent Med J. 2015; 17: 13515.
15. Lyu T, Zhang Y, Hu X, Cao Y, Ren P, Wang Y. The effect of an early oral stimulation program on oral feeding of preterm infants. International Journal of Nursing Sciences. 2014; 1: 42-47.
16. Lessen BS. Effect of the Premature Infant Oral Motor Intervention on Feeding Progression and Length of Stay in Preterm Infants. Advances in Neonatal care. 2011; 11: 129-39.
17. Hwang YS, Vergara E, Lin CH, Coster WJ, Bigsby R, Tsai WH. Effects of prefeeding oral stimulation on feeding performance of preterm infants. Indian J Pediatr. 2010; 77: 869-73.
18. Fucile S, Gisel EG, Lau C. Effect of an oral stimulation program on sucking skill maturation of preterm infants. Dev Med Child Neurol. 2005; 47: 158-68.

****