

Effect of Oromotor Stimulation on Feeding Performance and Weight Gain of Preterm Babies in Selected Hospital, Kolkata

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Abstract: Assessment of effect of oromotor stimulation on feeding performance and weight gain in selected hospitals, Kolkata.

Background : According to WHO, every year about 15 million babies are born prematurely around the world. Almost 1 million children die each year due to complication of preterm birth (2013). In India, out of 27 million babies born every year (2010 data), 3.5 million babies are premature.

Oral feeding difficulties are almost common in preterm neonates. Coordinated suck-swallow-breath pattern is not developed under 34 weeks of gestational age. So most of the preterm neonates are not able to have an independent feeding in that due time.

Aims: 1. To assess the existing feeding performance of preterm babies in experimental group and control group.

2. To assess existing body weight of preterm babies in experimental group and control group.

3. To find out the effect of oromotor stimulation on feeding performance of preterm babies.

4. To measure the effect of oromotor stimulation on weight gain of preterm babies.

Materials and Methods: Non probability purposive sampling technique was used to collect data from sixty preterm babies (30 in interventional group and 30 in control group) with the help of standardized IBFAT(Infant Breast Feeding assessment tool) & weight checking proforma. Inter rater reliability for IBFAT ($r = 0.92$) & Weighing machine used for weight checking ($r = 0.93$) was done. Pretest post test control group time series design was adopted. Demographic data (gestational age, birth weight , age of day of 1st intervention) was collected from each baby.

Results : Results revealed the significant difference in pre and post interventional breast feeding performance and weight of preterm babies between day 1 and day 7 in the experimental group as computed 't' value 30.91[(df 29) =2.71, $p < 0.001$] and 11.87 [(df 29) =2.71, $p < 0.001$] respectively. Result also showed significant difference in feeding performance and weight in experimental and the control group on day 7 as 't' (df 58) = 9.3, $p < 0.001$ and 't' (df 58) = 2.23, $p < 0.5$.

Conclusion : Oromotor stimulation is effective in improving feeding performance and weight gain of preterm baby.

Keywords: Oromotor Stimulation, Feeding performance, Weight gain.

Date of Submission: 16-03-2020

Date of Acceptance: 01-04-2020

I. Introduction

The last century has witnessed a considerable rise in the survival of young preterm infants with feeding difficulties thanks to the advances in their care(1). Oral feeding difficulties are almost common in preterm neonates due to problems in their cardio respiratory and central nervous systems as well as the incomplete development of oral structures (2).Coordinated suck- swallow- breath pattern is a significant aspect of a successful feeding. Under 32 weeks of gestational age most preterm neonates are not able to have an independent feeding and they are fed by tubes (1). Tube feeding throughout hospital stay affects the ability of infants to obtain full oral feeding, which may cause considerable feeding disorders and aversive or hypersensitive responses to being stroked around or in the mouth (3). The oromotor stimulation, may enhance the maturation of central and/ or peripheral neural structures, leading to improved sucking skills and coordination of the suck- swallow- breathe pattern. So an initiation is taken by the researcher in this study to evaluate the effect of oromotor stimulation to enhance the breast feeding efficiency and weight gain in preterm babies.

II. Material And Methods

This quasi experimental study was carried out on neonates admitted in neonatal unit , I.P.G.M.E.R. & S.S.K.M. Hospital and R.G.Kar Medical College and Hospital , Kolkata from December 2018 to January 2019. A total 60 neonates of aged 32 to 34 weeks were in this study.

Study Design: Quasi experimental pre test post test control group time series design.

Study Location: Neonatal unit, I.P.G.M.E.&R,S.S.K.M. Hospital and R.G.Kar Medical College and Hospital, Kolkata.

Study Duration: December 2018 to January 2019.

Sample size: 60 preterm babies.

Sample size calculation: Sample size was estimated by purposive sampling technique.

Subjects & selection method: All preterm babies admitted in Neonatal Unit was population. In this study the sample was 60 preterm babies who were admitted in Neonatal unit of IPGME&R, S.S.K.M. Hospital, Kolkata and R.G.Kar Medical College and Hospital, Kolkata and those who fulfilled the desired inclusion criteria.

Inclusion Criteria

- Preterm babies 30-34 weeks.
- Haemo dynamically stable .
- Neonates who were totally fed through orogastric tube.
- Neonates whose parents were willing to participate.

Exclusion Criteria

- Preterm babies with congenital anomalies.

Procedure methodology

The researcher underwent 3 days session on oromotor stimulation and actively participated in this. The preterm babies were selected according to inclusion criteria of study. The preterm babies were included in the present study after being obtaining informed consent from the parents of each baby. Demographic data were collected from record. Observation of dependent variable was done on day one for first time before intervention and on day 7. Weight was taken on 1st day and 7th day at fixed time before feeding. The intervention consisted of motor stimulation to the oral structures. Hand hygiene done before intervention. Perioral stimulation to the cheeks, lips, and jaw for 7 minutes. Intraoral stimulation to the gums and tongue for 5 minutes. Non nutritive sucking on a pacifier (little finger) for 3 minutes. 15 minutes stimulation was performed before feeding for 2 times in a day for a period of 7 days. The babies were placed in supine position in the radiant warmer throughout the intervention. The babies included in the control group who received their feed only from their caregiver, no intervention was given by researcher. Observation of breast feeding efficiency done by Infant Breastfeeding Assessment Tool (Matthews , 1988) during first 10 minutes of breast feeding in both the groups. Data were collected from experimental group and from control group for seven days.

Statistical analysis

Data was analyzed using descriptive and inferential statistics. Demographic characteristics are collected and analyzed using descriptive statistics. Unpaired t test was used to ascertain significance of differences between mean value of breast feeding efficiency and weight gain of control group and experimental group and in addition paired t test also used to ascertain significance of differences between mean value of breast feeding efficiency and weight gain of experimental group on day 1 and day 7.

III. Result

Table 1: Mean, mean difference, standard deviation, and their significances between breast feeding efficiency scores of experimental group babies on 1st day and 7th day of observations.

Breast feeding efficiency scores of preterm babies on	Mean breast feeding efficiency scores	SD	Mean difference	't'
1 st day	2.9	1.16	6.27	30.91***
7 th day	9.17	1.15		

t df (29) = 2.71, p < 0.001

Data presented in the table 1 showed that the mean breast feeding efficiency score of the experimental group babies on 7th day (9.17) after giving oromotor stimulation was higher than the mean breast feeding efficiency score (2.9) on 1st day, before giving oromotor stimulation.

Paired ‘t’ test result showed, the ‘t’ value computed in the given data (30.91) which was statistically significant at 0.001 level of significance (2.71). This showed that the obtained difference was a true difference and not by chance.

So, it can be concluded that the oromotor stimulation increased the breast feeding efficiency among experimental group of preterm babies.

Table 2: Mean, mean difference, standard deviation, and their significances between weight gain scores of experimental group babies on 1st day and 7th day of observations.

Weight gain scores of preterm babies on	Mean weight gain (gm)	SD	Mean difference	‘t’
1 st day	1612.4	208.56	80.24	11.87***
7 th day	1692.64	206.4		

n₁=30

t df (29) = 2.71, p < 0.001

Data presented in the table 2 showed that, the mean weight gain score of the experimental group babies on 7th day (1692.64) after giving of oromotor stimulation was higher than the mean weight gain score (1612.4) on 1st day before giving oromotor stimulation.

Paired ‘t’ test result showed that the ‘t’ value computed in the given data (11.87) which was statistically significant at 0.001 level of significance (2.71). This showed that the obtained difference was true difference and it was not by chance.

So, it can be concluded that the oromotor stimulation was effective in increasing of weight among experimental group of preterm babies.

Table 3: Mean, mean difference, standard deviation, and their significances between breast feeding efficiency scores of experimental group and control group preterm babies on 7th day of observation after intervention.

n=60 (30+30)

Day of observation	Group	Breast feeding efficiency scores of Preterm babies			
		Mean	Mean difference	SD	‘t’
7 th day	Experimental Group	9.17		1.15	
	Control Group	6.2	2.97	1.47	9.3***

t df (58) = 2.66, p < 0.001

Data presented in the table 3 showed that the mean breast feeding efficiency score of the experimental group babies after giving oromotor stimulation on 7th day (9.17) was higher than the mean breast feeding efficiency score of control group babies (6.2) on 7th day .

Un paired ‘t’ test result showed that the ‘t’ value computed in the given data (9.3) which was statistically significant at 0.001 level of significance (2.66). This showed that the obtained difference was a true difference and not by chance.

So, it can be concluded that there was difference of feeding performance between experimental group and control group of preterm babies after providing oromotor stimulation to experimental group.

Table 10: Mean, mean difference, standard deviation, and their significances between weight gain of experimental group and control group preterm babies on 7th day of observation after intervention.

n=60 (30+30)

Day of observation	Group	Weight gain of Preterm babies (gm)			‘t’
		Mean	Mean difference	SD	
7 th day	Experimental Group	1692.64		206.4	
	Control Group	1589.16	103.48	179.92	2.23*

t df (58) = 2.00 , p < 0.05

Data presented in the table 9 showed that the mean weight gain of the experimental group babies after giving oromotor stimulation on 7th day (1692.64) was higher than the mean weight gain score of control group babies (1589.16) on 7th day.

Un paired ‘t’ test result showed that the ‘t’ value computed in the given data (2.23) which was statistically significant at 0.05 level of significance (2.00). This showed that the obtained difference was a true difference and it was not by chance.

So, it can be concluded that there was difference of weight gain between experimental group and control group of preterm babies after providing oromotor stimulation to experimental group.

IV. Discussion

Majority of the preterm baby (53.33%) in experimental group were in the 33 weeks 1 day to 34 weeks of gestational age. Most of the preterm babies (36.67%) in control group were birth weight of 1000- 1200 grams. On day of 1st intervention, most of the preterm babies (43.33%) in control group were between 8th day to 10th day of age.

Related to feeding performance of preterm baby

Mean post intervention breast feeding efficiency score among preterm babies in experimental group receiving oromotor stimulation was higher than that of mean post intervention breast feeding efficiency score of control group in day 7 which was statistically significant. [t^2 (df 58) = 9.3, $p < 0.001$]. This result is likely to be supported by the study of Lyu Tian- chan , Xia Yu et al. in this study the experimental group received the exact oral stimulation program developed by Fucile et al. which consisted of 12 min of oral stimulation and 3 min of non nutritive sucking. Findings of their study show that statistical results were interpreted as significant at 0.05 level of significance. The study shows that the time from initiation of oral feeding to full oral feeding was significantly shorter in experimental group ($p < 0.05$) while feeding efficiency was higher in experimental group ($p < 0.05$) compared to controls. Lyu Tian- chan , Xia Yu et al. study concluded that an early oral stimulation program is beneficial in preterm infants which support the present study.

This study likely to be supported by the study of Thakkar P A, Rohit H R et al. which describes that there was better feeding performance, shorter transition to independent oral feeding ($p < 0.001$).

This result is also supported by the study of Younesian S, Yadegari F et al. it is stated that transition to oral feeding was acquired significantly earlier in the infants in the experimental group than in the controls : 13 and 26 days, respectively ($p < 0.001$).

Related to weight gain

Mean post intervention weight gain score among preterm babies in experimental group receiving oromotor stimulation was higher than that of mean post intervention weight gain score of control group in day 7 which was statistically significant. [t^2 (df58) = 2.23, $p < 0.5$]. This result of the present study supported by the study of Thakkar Pareshkumar A, Rohit H. R. et al. conducted on effect of oral stimulation on feeding performance and weight gain in preterm neonates. The study result revealed that compared with the control group, the experimental group had significantly gain weight. ($p < 0.001$).

V. Conclusions

On the basis of findings of present study the following conclusions can be drawn that prefeeding oromotor stimulation was an effective methods to improve feeding performance and weight gain in preterm babies.

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