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Non Nutritive Sucking of Breast on Physiological Stability and Nutritional Status among Preterm Babies on RT Feeding

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ABSTRACT

In the neonates,sucking behavior is one of the first coordinated muscular activities. Girls have more sucking than boys. The sucking and swallowing are coordinated together, through which over all development occurs in preterm babies. Once the preterm babies will take the non nutritive sucking with breast it would improve the physiological and nutritional health along with a good bond between the mother and baby. **Objectives:** 1.To assesses the physiological stability and nutritional status among preterm babies in control group and experimental group.2.To assess the physiological stability and nutritional status among preterm babies between the control and experimental group. **Material & Method:** An experimental case control design was used for the study. Study was conducted in selected NICUs. 40 preterm infants between 30-36 weeks weighing 1-2.4 on RT feeding were selected with non probability purposive sampling technique. Preterm babies who are on ventilator,hemodynamically unstable,with cleft lip and palate were excluded Samples were divided in to experimental&control group.NNS of breast was given to experimental group. Both groups were assessed by using observation check list which includes physiological parameters that is HR, RR, SPO2and temperature, nutritional parameters that are hemoglobin, weight and amount of feed and parameters like transition of feed from RT to wati spoon feeding, length of hospital stay and day on full feed. RT feeding was given immediately after the procedure. **Result & Conclusion** The study result prove that the use of non nutritive sucking of the breast among preterm babies on RT feeding improve the physiological stability and nutritional status along with early transition to wati spoon feeding, decreased length of the hospital stay and earlier intake of full feed.

Keywords: *Non nutritive sucking, Physiological stability& nutritional status.*

INTRODUCTION

Preterm birth is a significant public health problem across the world because of associated neonatal mortality, Common problems associated with preterm babies are feeding because of improper sucking and swallowing coordination, less immunity and long term admission in NICU causes infection and hypothermia. [1]

According to WHO, Every year 15 million babies are born prematurely around the world and that is more than 1 in 10 of all babies born globally. Almost 1 million babies die each year due to complications of preterm with across 184 countries the rate of preterm birth ranges from 5% to 18% of babies born. In India, out of 27 million babies born every year, 3.5 million babies are premature.[2]

From the clinical perspective, the ability to feed depends upon a coordinated sucking, swallowing and breathing pattern. In preterm infants less than 32 weeks gestation, this ability is not usually effective enough to sustain full oral feed. Preterm infants are fed by RT feeding and then transition from RT to breast. Non-nutritive sucking is the process of allowing a baby to suck breast after expressing the milk.[3]

In the neonates, sucking behavior is one of the first coordinated muscular activities. It is under the control of the brainstem. Girls have more sucking activity and than boys. A studywas conducted by centre for reproductive health, they found that non nutritive sucking of a breast reduces the experience of pain, encourage sucking as the child learns to associate the breast with food whenever

the baby is held from skin to skin. In preterm neonates the sucking reflex is very poor; some studies show that non nutritive sucking can improve e the sucking reflex in preterm babies.[4]

The sucking and swallowing are coordinated together ,so once sucking reflex increase in preterm babies, it increases the swallowing reflex, through which over all development occurs in preterm babies. In preterm babies all the organ and all the systems are immature so the overall development will not be accomplished. Once the preterm babies will take the non nutritive sucking with breast it would improve the physiological stability and nutritional status along with a good bond between the mother and baby[5]

REVIEW OF LITERATURE

1. Literature related to problems of preterm babies

An article written by Carla Lucchi Pagliaro & KarinaElenazaq1 Bernardis Buhler, objectives for this study was analyze the scientific literature on dietary changes in preterm children during the first year of life. The PubMed data were used for the article selection. Analysis was done according to their objectives. They selected the publications from 1996 to 2014. They were identified 282 studies and they conclude that low birth weight preterm newborns are more likely to have feeding problems in their early neonatal period Premature baby development says, in late preterm babies organs are fully developed, but there are lots of changes happen in their brain. In extreme preterm babies have high risk of long term developmental problems like Feeding problems, disability in social and emotional development, learning, language, mathematical and physiological skill. He also explains if special attention is not given specially to extreme Preterms can lead to lifelong disabilities.[6]

2. Literature related to non nutritive sucking of preterm babies

A comparative study conducted by the Fazeh Asad Sollapour and Fariba Yadegri for assessing the effect of non nutritive sucking and pre feeding oral stimulation on time to achieve independent oral feeding for preterm infants.32 preterm infants were taken for study and assigned randomly in to3 groups .One intervention group receives the pre feeding oral stimulation program and other receive the non nutritive sucking while the control group received feeding as per hospital routine. The infant's weights were measured weekly from birth and at discharge times. Study result shows, Weight gaining at discharge time in non nutritive sucking group was significantly ($p<0.05$) higher than control group and pre feeding and oral stimulation groups. This study revealed that non nutritive program were effective in increasing the weight preterm babies.[7]

3. Literature related to non nutritive sucking of breast in preterm babies

A quasi experimental study done by Flaviya Eristina and clea Rodriguez Leone for assessing the effect of non nutritive sucking of breast to describe the development of sucking pattern in preterm babies. 95 preterm newborns were taken for the study. The group was divided into 3. Group 1 was control group, they did not receive non nutritive sucking stimulation, group 2 was with stimulation by gloved fingers and group 3 underwent the stimulation of sucking reflex by empty breast. Samples were with gestational age less or equal to 33 weeks. Study result showed that the sucking pattern and coordination between sucking and swallowing improve with stimulation of gloved finger and empty breast. It was more evident in group with stimulation of by empty breast. So the study conclude that sucking of a empty breast is an effective method to improving the coordination between sucking, swallowing and breathing were by it helps in the early recovery of newborns.[8]

MATERIAL AND METHOD

An experimental case control design was used for the study. This study was conducted in selected Neonatal intensive care units. 40 preterm infants on RT feeding were selected with non probability purposive sampling technique. Samples were divided in to experimental group and in control group equally. Data collection tool had two sections, .Section I-demographic variables of samples section II- had observational checklist with 3 parts,which included, physiological parameters, nutritional parameters and day on full feed, transition from RT to wati spoon feeding and length of hospital stay. Ethical consideration of research study included like getting permission from institutional ethical committee, university permission and consent from the parents of the samples were achieved before starting the study. Preliminary assessment of physiological stability

and nutritional status assessed in both experimental and control group. After the Expression of breast milk,non nutritive sucking of breast given for 5 minutes in experimental group before RT feeding. This was repeated for three times in a day for seven days. In control group only the observation for seven days were done.

RESULT AND DISCUSSION

Analysis of data organized under following headings

Section I: Frequency and percentage distribution of demographic variable

Section II: Analysis of selected parameters in experimental group

Section III: Analysis of selected parameters in control group

Section IV: Distribution of selected parameters in experimental and control group

SECTION: Frequency and percentage distribution of Demographic Variables

All the samples belongs to age group of 1-5 days both in experimental an control group . In experimental group 55% were males, in control group 60% were males. In case of weight 70%in experimental group belongs to 1.2 – 2 kg. 70% of samples in experimental group were in between 30 – 34 weeks of gestation. In experimental group 65% were belongs normal delivery whereas In control 75%

SECTION: II

Table No: 1: Physiological parameters in experimental group n =20

Parameters	Pre assessment (Day 1)		Post Assessment (Day 7)		t value	P value
	Mean	SD	Mean	SD		
Respiratory rate(b/mts)	51.20	7.61	41.30	5.32	7.906	0.000
Heart rate(b/mts)	150.50	5.65	142.00	4.54	6.285	0.000
Oxygen saturation (%)	98.40	1.35	100.0	0.00	-5.287	0.000
Temperature(F)	97.77	0.43	98.22	0.28	-4.265	0.000”

Above table shows that there is significant difference in the physiological parameters in pre assessment and post day assessment as the p value is less than 0.05.

Table No: 2: Nutritional parameters in experiment n = 20

Parameters	Pre assessment (Day1)		Post day (Day7)		t value	P value
	Mean	SD	Mean	SD		
Hemoglobin (gm/dl)	18.95	1.60	20.315	1.69	-4.704	0.00
Weight (in kg)	1.63	0.25	1.67	0.23	-1.474	0.157
Feed(in ml)	86.4	69.38	266.5	69.15	-13.784	0.00

Above table shows that there is significant difference in the nutritional parameters in pre assessment and post day assessment as the p value is less than 0.05.In weight mean shows the slight difference but statistically there isno significant difference in pre assessment and post assessment of as the p value is greater than 0 .05.

SECTION: III

Table No: 3: Physiological parameters in control group n=20

Parameters	Pre assessment(Day1)		Post day (Day7)		t value	P value
	Pre mean	SD	Post mean	SD		
Respiratory rate(b/mt)	52.40	5.79	53.80	5.87	-1.606	0.125
Heart rate(b/mt)	153.80	33.67	154.10	8.22	-1.204	0.243
Oxygen saturation (%)	97.55	1.79	97.35	1.39	0.535	0.599
Temperature(F)	97.41	0.65	97.26	0.56	1.809	0.086

Above table showsthat there is no significant difference in the physiological parametersin pre assessment and post day assessment ofas the p value is less than 0.05.

Table No: 4: Nutritional parameters in control group n= 20

Parameters	Pre assessment (Day1)		Post day(7)		t value	P value
	Mean	SD	Mean	SD		
Hemoglobin(gm/dl)	18.02	1.588’	17.325	1.527	3.212	0.005
Weight(Kg)	1.748	0.240	1.61	0.213	5.013	0.000
Feed(ml)	60.9	53.1119	128.61	67.062	-8.624	0.000

Above tableshows that there is significant reduction in the nutritional parameters that is hemoglobin, weight between pre assessment and post day assessment of as the p value is less than 0.05.There is significant increase in feed it may because of the variations in the age in days and birth weight of the baby.

Table no: 5: Distribution of Physiological parameters in experimental and control group n= 40

	Parameters	Experimental group		Control group		t value	P value
		Mean	SD	Mean	SD		
Day 1	Respiratory rate(b/mt)	51.20	7.61	52.40	5.79	-0.561	0.578
	Heart rate(b/mt)	150.50	5.65	153.80	33.67	0.806	0.430
	Oxygen saturation(%)	98.40	1.35	97.55	1.79	1.693	0.099
	Temperature(F)	97.77	0.43	97.41	0.65	2.064	0.047
Day 7	Respiratory rate	41.30	2.32	53.80	5.87	-7.054	0.000
	Heart rate	142	4.54	154.10	8.22	-5.762	0.000
	Oxygen saturation	99.75	0.00	97.35	1.39	8.545	0.000
	Temperature	98.12	0.28	97.26	0.56	6.887	0.000

Table no 9 shows that the significant difference in the physiological parameters between the pre assessment and post day assessment of as the p value is less than 0.05

Table no: 6: Distribution of nutritional parameters in experimental and control group n= 40

	Parameters	Experimental group		Control group		t value	P value
		Mean	SD	Mean	SD		
Day 1	Hemoglobin(gm/dl)	18.95	1.60	18.02	1.59	1.85	0.07
	Weight(Kg)	1.63	0.25	1.748	0.240	-1.488	0.145
	Feed(ml)	86.4	69.38	60.9	53.1119	1.305	0.200
Day 7	Hemoglobin(gm/dl)	20.315	1.69	17.325	1.527	5.86	0.000
	Weight(Kg)	1.67	0.23	1.61	0.213	1.857	0.397
	Feed(ml)	266.5	69.15	128.61	67.062	6.402	0.000
Analysis of parameters in experimental and control group							
Parameters Mean		**Experimental group**		**Control group**		**t value**	**P value**
		SD	**Mean**	**SD**			
Transition of RT feed to wati spoon feeding		4.75	1.59	10.2	1.93	-9.812	0.000
Length of hospital stay		10.35	2.49	17.9	3.05	-8.549	0.00.
Day on full feed		6.35	2.23	11.75	2.42	-7.329	0.000

Above table shows that there is a significant difference in nutritional parameters such as haemoglobin, feed in experimental group in the postday assessment as the p value is less than 0.05. But in weight no significant difference as the p value is more than 0.05,there is a significant difference in the parameters such as the transition of RT feed to wati spoon feeding, length of the hospital stay, and day on full feed as the p value is less than 0.05

DISCUSSION

Non nutritive sucking of breast in preterm babies suggests that, it may increase the sucking, swallowing reflexes. Because sucking and swallowing is a coordinated activity. In preterm babies sucking reflex is very poor, through a non nutritive sucking of breast can increases the sucking along with swallowing reflexes

In experimental group, the analysis of physiological parameters that is, respiratory rate, heart rate, oxygen saturation and temperature showed the significant difference in the first day (pre assessment) and 7th day of assessment as the p value is less than 0.05. In respiratory rate and heart rate shows the significant reduction and oxygen saturation and temperature shows the significant increase. Nutritional parameters in experimental group shows the significant increase in the hemoglobin and feed, but in weight the mean shows a slight difference but statistically there is no difference in weight it is may be because of normal weight loss in newborns during the first 3 to 5 days.

In control group the analysis of physiological parameters like, respiratory rate, heart rate, oxygen saturation and temperature shows there is no significant difference in the first day (pre assessment) and 7th day of assessment as the as the p value is more than 0.05. But in the nutritional parameters that is hemoglobin and weight there is significant reduction from first day to 7 th day which shows in the physiological parameters of a neonate settle down early when they receive non nutritive sucking than the control group.

When the effect of the non nutritive sucking in physiological stability and nutritional status by using

control and experimental group, it showed that there is no much significant difference in physiological stability. It may be because of the normal phenomena of any newborn in adaptation to the extra uterine life. But even though there was no statistical difference but mean score showed that the babies in experimental group reached physiological stability faster than the newborns of control group.

In nutrition parameter that is, haemoglobin showed significant difference in the experimental and control group. In weight there is a no significant difference in the experimental and control group as the p value is more than 0.05. In feeding amount there is statistical difference in control and experimental group, means the newborns who received non nutritive sucking of breast were able to tolerate the feed early than the new born in control group.

Assessment of other parameters that is, day on full feed, transition to wati spoon feed and days of hospital stay had significant difference in control and experiment group. Above all parameters were achieved early in experimental group.

CONCLUSION

In the present study conclude with the purpose of finding out the effect of non nutritive sucking of breast on physiological stability and nutritional status among preterm babies on RT feeding. Findings of the study clearly indicated that there are changes in physiological stability and nutritional status, more importantly in tolerance of feeding amount and transition of feed from Ryle's tube to wati spoon. For a premature baby the feeding is an important issue especially if it is associated with low birth weight. The researcher tried to limit the age to 1-5 days so that some uniformity can be maintained. It was difficult for the researcher to convince the mothers about the importance of the study.

Conflict of Interest – Nil

Source of Funding – Self Funding

Ethical Consideration : Ethical committee letter were submitted to university for getting permission to conduct the study. Permission was obtained from the concerned authority of the settings. Consent was taken from the parent of the each sample after explaining the procedure and they were allowed to withdraw from the study at any time without any compensation.

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