ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 07, pp.55032-55035, July, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EFFECT OF SWADDLING DURING PALADAI FEEDING ON BRADYCARDIA, DESATURATION AND APNEA AMONG VERY LOW BIRTH WEIGHT NEONATES

[1]Anjali Krishna, K., *,[2]Dr. Vetriselvi, P. and [3]Dr. Nishad Plakkal

[1]Second year MSc Nursing, College of Nursing, JIPMER, Puducherry
[2]Assistant Professor, College of Nursing, JIPMER, Puducherry
[3]Assistant Professor, Department of Neonatology, JIPMER, Puducherry

ARTICLE INFO

Article History:
Received 28th April, 2017
Received in revised form
11th May, 2017
Accepted 11th June, 2017
Published online 31st July, 2017

Key words:

Swaddling,
Paladai feeding,
Desaturation,
Apnea,
Bradycardia,
Very low birth weight infants.

ABSTRACT

Background and Objective: Swaddling is a traditional practice of covering an infant in a blanket in a particular fashion. It is known to improve the physiological parameters. Paladai feeding is a common procedure in NICU. Paladai feeds are time consuming and are associated with desaturation episodes. The aim of the present study is to assess the effect of swaddling on bradycardia, desaturation and apnea during paladai feeding among very low birth weight infants.

Materials and Methods: A cross over design with simple random sampling technique was used to select 58 very low birth weight infants who fulfilled the inclusion criteria. Infants were randomized to receive either swaddling or conventional technique of intervention during paladai feeding. Episodes of desaturation, bradycardia and apnea were calculated with the help of pulse oxymeter. Parameters like volume of feed, duration of feed were also recorded. A period of 24 hours was maintained as wash out period. The next day the infants were crossed over, infants in the swaddled group were non swaddled during paladai feeding and infants in non swaddling group were swaddled during paladai feeding and the same parameters were monitored and recorded. For analyzing the data, descriptive statistics (frequency, percentage, median, mean and standard deviation) and inferential statistics (McNemar test, and Wilcoxon signed rank test) were used. All the statistical analyses were carried out at 5% level of significance and p value < 0.001 was considered as significant.

Results: Comparison of episodes of desaturation showed that the mean saturation episodes in swaddled and non-swaddled group were 0.90(1.518) and 1.66(1.763) respectively and the difference in the group were statistically significant ($p<0.001$). Comparison of Mean episodes of bradycardia among swaddled and non-swaddled group were 0.07(0.256) and 0.22(0.650) respectively. The difference was not statistically significant as a few episodes of bradycardia were found in both groups but swaddled infants had fewer episodes of bradycardia during paladai feeding. No apneic episodes were noted in both the groups during the study. Comparison of mean duration of feeding in swaddled and non-swaddled groups were 3.79(1.587) and 4.81(2.180) respectively and the difference was statistically significant ($p<0.001$). The study showed that paladai feeds were associated with desaturation and bradycardia and swaddled infants were found to have fewer episodes of desaturation, bradycardia and reduced duration of feeding.

Conclusion: The study concluded that swaddling is an effective intervention in reducing the episodes of desaturation and bradycardia during paladai feeding. Also swaddled infants were found to take lesser time duration for paladai feeding.

Citation: Anjali Krishna, K., Dr Vetriselvi, P. and Dr. Nishad Plakkal, 2017. "Effect of swaddling during paladai feeding on bradycardia, desaturation and apnea among very low birth weight neonates", *International Journal of Current Research*, 9, (07), 55032-55035.

INTRODUCTION

Being the second largest democratic nation Indian population accounts for a score of 1.21 billion. Of the billions, 39% constitute the children; among which 29% being the under-fives. Neonatal period is the most vulnerable as well as the critical period for children. The period extending from birth to 28 days of life is the neonatal period between 1990-2015 neonatal mortality rate has reduced by 47% i.e. from 36-19 deaths/1000 live birth. In Asia, however the incidence is 19.7%. Low birth weight infants constitute children born with birth weight less than 2500gram whereas very low birth weight infants consists of infants weighing less than 1500gram. Low birth weight comprises 20% of all live births in India. Approximately 11% of these babies weigh below 2000 gram and 3.7% less than 1500. About 60-80% of all neonatal death in India is due to premature birth and low birth weight. Most of these children will not have normal sucking and rooting reflexes developed. Hence, feeding these children is a challenging task. Alternative feeding techniques are followed until normal reflexes are developed. It is accomplished either by orogastric tube feeding or by paladai feeding. A paladai is a feeding device which is popularly being used in infant feeding. It is a "small bowl with a spout". It can hold 10 ml of milk at a time. Paladai feeds are often used to feed very low birth weight

Corresponding author: **Dr. Vetriselvi, P.**
Assistant Professor, College of Nursing, JIPMER, Puducherry

infants. Compared to cup feeding paladai feeds are found to be more effective in increasing the neonatal weight gain. At the same time infants fed by paladai are less physiologically stable. Studies also shows that desaturation episodes are common among infants on paladai feeding. Swaddling is a traditional child care practice where infants are wrapped in blankets in such a way that their movement is restricted. Swaddling is known to improve the physiological parameters among infants. It is practiced during painful procedures. Swaddling is also known to maintain thermoregulation and improve neuromuscular development. Infants are found to sleep better when they are swaddled and they are less frequently aroused.

MATERIALS AND METHODS

A randomized crossover trial was carried out to study the effect of swaddling during paladai feeding on bradycardia, desaturation and apnea among very low birth weight neonates in the Neonatal Intensive Care Unit, JIPMER, Puducherry.

Inclusion criteria

Very low birth weight infants with

- Birth weight < 1.5kg.
- On paladai feeding.

Exclusion criteria

Very low birth weight infants with

- Congenital abnormalities including cleft lip.
- Partial gavage feeds.
- Supplemental oxygen or other mechanical respiratory support.

Sampling

Simple random sampling technique was used.

Instruments

The data collection proforma consisted of two parts:

Section A: Demographic variables

It deals with demographic profile. It includes 9 variables - Study number, Hospital number

Mother's name, Baby's name, Date of birth, Date of admission, Gestational age at birth, Birth

Weight and Gender. Data's were collected by the investigator from the case sheet of enrolled neonates.

Section B: Parameters: Swaddled or non-swaddled, duration of feed, volume of feed, number of episodes of desaturation, number of episodes of apnea requiring stimulation and number of episodes of bradycardia.

The above data's were collected by the investigator using observation technique

Data collection procedure

The study was approved by the Nursing Research monitoring committee, JIPMER and the Institute ethical committee (Human studies). Data collection period was 6 weeks. The study was conducted in NICU, JIPMER. The subjects who met the inclusion criteria were selected by simple random sampling. The investigator first introduced her to the parents, the procedure was explained and consent was obtained from the mothers. On day 1 very low birth weight infants were randomized into swaddled and non-swaddled group using computer generated random number table. In experimental group very low birth weight infants were swaddled and paladai feeds were given. All infants were connected to a pulse oximeter throughout the feeding time. During feeding parameters like bradycardia, desaturation episodes, apnoeic episodes, volume of feed, and duration of feed was assessed. In the other group conventional method was followed during paladai feeding and parameters were assessed. A 24 hour wash out period was established between the two interventions. Next day those swaddled the previous day were cross over into non-swaddled and non-swaddled into swaddled and paladai feeds were given. Parameters were again monitored and recorded.

Ethical considerations

Permission was obtained from the Institute (JIPMER) ethical committee, Human studies. Informed consent was obtained from every mother after a brief explanation regarding the study by the researcher. Confidentiality was maintained during the data collection period.

Data analysis

Descriptive statistics (frequency, percentage, mean and standard deviation) and inferential statistics (McNemar test and Wilcoxon signed rank test) were used in the study. Gender, birth weight and gestational age were expressed as frequency with percentage. The comparison of episodes of desaturation was carried out using Wilcoxon- Signed Rank test and comparison of episodes of bradycardia were carried out using McNemar test. Comparison of duration of feeds was carried out using Wilcoxon- Signed Rank test.

Table I. Distribution of demographic variables among study population

N=58

Variables	Categories	Frequency(N)	Percentage (%)
Gender	Female	32	55.2
	Male	26	44.8
Gestational age	<28 weeks	2	3.4
	28-33 weeks	27	46.6
	34-37 weeks	25	43.1
	38-40 weeks	4	6.9
Birth weight	1000-1500 gram	51	87.9
	<1000 gram	7	12.1

Table II: Effect of swaddling on desaturation episodes

N=58

Parameter	Swaddling		Non swaddling		$Statistical significance(P)
	Mean	Standard Deviation	Mean	Standard Deviation	
Number of episodes of desaturation	0.90	1.51	1.66	1.76	-3.829*

*p<0.001

$Wilcoxon Signed Rank Sum test

Table III: Effect of swaddling on episodes of bradycardia

N=58

		Non- swaddling		Total	$Statistical significance
		No episodes of bradycardia	At least one episode of bradycardia		
Swaddling	No episodes of bradycardia	49	5	54	0.063
	At least one episode of bradycardia	0	4	4	
Total		49	9	58	

$McNemar test

Table III: Effect of swaddling on duration for feeds

N=58

Parameter	Swaddling		Non-swaddling		$Statistical significance (P*)
	Mean duration for feeds	Standard Deviation	Mean duration for feeds	Standard Deviation	
Duration for feeds in minute	3.79	1.58	4.81	2.18	-3.970*

*p<0.001
$Wilcoxon Signed Ranks test

RESULTS

- The proportion of female babies who were included in the study was more than the number of male babies. Percentage of female babies was 55.2% and male babies 44.8%.
- The percentage of infants between birth weights 1000-1500g was 87.9% and less than 1000g was 12.1%.
- The percentage of infants with gestational age less than 28 weeks was 3.4%, between 28-33 weeks was 46.6%, between 33-37 weeks was 43.1% and between 37-40 weeks was 6.9%.
- The comparison of mean score of desaturation episodes shows that mean scores of desaturation episodes was 0.90+ 1.51 in swaddled group and 1.66+ 1.76 in non-swaddled group. A statistical significant difference was found between swaddled and non-swaddled infants on desaturation episodes (p<0.001).
- The comparison of episodes of bradycardia during swaddling and non-swaddling shows that 49 infants had no episodes of bradycardia when they were swaddled as well as non- swaddled. Five infants had bradycardia during non- swaddling and when they were swaddled they had no episodes of bradycardia. Similarly four infants had bradycardia both during swaddling and non-swaddling. No significant difference was found between the two groups (p>0.05). As the total episodes of bradycardia were less among swaddled group it can be rationalized that swaddling can be effective in reducing episodes of bradycardia.
- Comparison of mean score of duration of feeds shows that mean scores of duration for feeds in swaddled group is 3.79+1.58 and that of non-swaddled group is 4.81+2.18. A statistical significant difference was found between swaddling and duration of feeds (p<0.001)
- Comparison of mean scores of volume of feeds shows that volume of feed in both groups was equal and thus no significant relationship was noted. The mean (SD) of volume of feeds in both group was 9.38(2.44).
- Apneic episodes were not demonstrated in both the groups throughout the study period.

DISCUSSION

Findings of study are discussed under each objective:

The first objective was to assess the effect of swaddling during paladai feeding on bradycardia, desaturation and apnea among very low birth weight infants. The related hypothesis was swaddling during paladai feeding is effective in reducing the bradycardia, desaturation episodes and apnea.

- The comparison of mean (SD) of episodes of desaturation between groups (Table II) showed that mean (SD) episodes of desaturation in swaddled and non-swaddled group was 0.90(1.51) and 1.66(1.76) respectively and the difference between the groups were found to be statistically significant (p<0.001). Hence it is concluded that swaddling is effective in reducing the episodes of desaturation.
- The comparison of episodes of bradycardia between two groups is shown in Table III. It shows that 49 infants had no episodes of bradycardia when they were swaddled as well as non- swaddled. Total episodes of bradycardia in both the groups were nine. Five infants had bradycardia during non- swaddling and when they were swaddled they had no episodes of bradycardia. Similarly four infants had bradycardia both during swaddling and non-swaddling. No significant difference was found between the two groups (p>0.05). As the total episodes of bradycardia were less among swaddled group it can be rationalized that swaddling can be effective in reducing episodes of bradycardia.
- No apneic episodes were reported in the entire course of study. No studies were been found in literatures regarding the effect of swaddling during paladai feeding on bradycardia, desaturation and apnea among very low birth weight infants. However the results of this study are consistent with those of other studies on the effect of swaddling on pain and physiological parameters. For instance, Shivani *et al*. (2015) conducted a study on effect of swaddling on pain and physiological parameters among 30 neonates during heel lance procedure and the results suggested that there was a significant difference (P<0.05) in heart rates of neonates with and without swaddling. In another study conducted by Sinpru *et al*. on the effect of swaddling on pain and physiological parameters showed that infants in swaddled group had stable heart rate (P<0.05 and F ratio 9.086). But changes in oxygen saturation were small (F ratio 1.515) and hence could not be differentiated. The second objective was to assess the effect of swaddling during paladai feeding on volume of feeds and duration for feeding among very low birth weight infants.
- The results of the study showed that comparison of mean (SD) of duration for feed between swaddled and non-swaddled groups was 3.79(1.58) and 4.81(2.18) respectively and the difference between the groups was statistically significant (P<0.001). Hence it can be concluded that swaddling is effective in reducing the

duration of paladai feeding among very low birth weight infants.

- The mean (SD) score of volume of feed in swaddled and non-swaddled groups was 9.34(2.44). Since mean scores were the same in both groups no statistical difference was found between swaddling and volume of feeds.

Conclusion

Swaddling is an effective intervention to reduce the episodes of desaturation and bradycardia. Swaddled infants take lesser duration for feeding while compared to non-swaddled infants. This technique emphasizes the concept and importance of meeting nutritional needs among very low birth weight infants on paladai feeds with swaddling. Moreover swaddling is a low cost intervention that can be easily implemented in NICU.

REFERENCES

2011 Census of India [Internet] [updated 2017 Jan 31; cited 2017 Feb 2]. Available from: https://en.wikipedia.org/wiki/2011_Census_of_India.

Aloysius A, Hickson M. 2007. Evaluation of paladai cup feeding in breast-fed preterm infants compared with bottle feeding. *Early Hum Dev*., 83: 619-21.

Bharati P, Pal M, Bandyopadhyay M, Bhakta A, Chakraborty S, Bharati P. 2011. Prevalence and causes of low birth weight in India. *Malays J Nutri*., 17: 301-13.

Blom MA, Van Sleuwen BE, de Vries H, Engelberts AC, L'hoir MP. 2009. Health care interventions for excessive crying in infants: regularity with and without swaddling. *J Child Health care*, 13: 161-76.

Child rights in India. Child in India Statistics and Children in India [Internet] India: 2010-2011[cited 2017 Jan 12]. Available from: http://www.childlineindia.org.in/rights.htm.

Feeding of normal and low birth weight babies [internet]. New Delhi: Neonatal Division, AIIMS; 2014 [cited on 2017 Feb 4]. Available from: https://www.newbornwhocc.org/Dec2014_pdf/Feeding-of-normal-LBW-baby-2014.pdf.

Hockenberry MJ, Wilson D. 2015. Wong's Essentials of Pediatric Nursing. New Delhi: Elsevier publications.

Kelly BA. Irageyen MM, Pomerantz SC, Montesir M, Isaza-Brando N. 2017. Swaddling and infant sleeping practices. *J Community Health*, 42: 10-4.

Lee CH, Bardach NS, Maselli JH, Gonzales R. 2014. Emergency department visits in Neonatal period in the United Sates. *PediatrEmerg Care*, 30: 315-18.

Marlow DR, Redding BA. 2010. Textbook of pediatric nursing. Philadelphia: Saunders.

Marofi M, Abedini F, Mohammadizadeh M, Talakoub S. 2016. Effect of paladai and cup feeding on premature neonates weight gain and reaching full oral feeding time interval. *Iran J Nurs Midwifery Res*., 21: 202-6.

Matha SS. 2005. Feeding the Low Birth weight. *Indian J Pract Pediatr*., 7: 304-9.

Meyer LE, Erler T. 2011. Swaddling: a traditional care method rediscovered. *World J Pediatr*., 7: 155-60.

Nejad NH, Pejham A, Rakshani MH, Hoseini BL. 2014. The incidence of low birth weight and small for gestational age and its related factors in neonates. *Int J Pediatr*, 2: 73-8.

Paladai [internet] [cited on 2017 Jan 30] Available from: http://www.blisstree.com/tag/paladai/.

Shivani T, Jyoti S, Yogesh K. 2015. Effect of Swaddling on Pain and Physiological Parameters in Neonates during Heel Lance. *Int J Nurs Educ*., 7: 54-7.

Sohn M, Ahn Y, Lee S. 2011. Assessment of primitive reflexes in High Risk Newborns. *J Clin Med Res*., 3: 285-90.

Swaddling [internet] [updated on 2016 Dec 16; cited on 2017 Jan 29]. Available from: https://en.wikipedia.org/wiki/Swaddling.

Tsogt B, manaseki- Holland S, Pollock J, Blair PS, Fleming P.2016. Thermoregulatory effects of swaddling in Mongolia: a randomized controlled study. *Arch Dis Child*, 10: 152-60.

UNICEF | Neonatal mortality [Internet][cited on 2017 Jan 28]. Available from: http://data.unicef.org/topic/child-survival/neonatal-mortality/.

WHO | Maternal, newborn, child and adolescent health [Internet] [cited on 2017 Jan 30]. Available from: http://www.who.int/maternal_child_adolescent/topics/maternal/en/.

****