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A Study to Evaluate the Effectiveness of Sucking Stimulation Techniques on Sucking Reflex among Neonates Born at Selected Hospitals

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Abstract: ***Introduction:*** ***Sucking problem is a cause of concern for many new mothers. This problem is quite common in initial stages after birth or when introduced to bottle, to breastfeed. The reasons of baby not sucking properly are a greater concern for mothers.*** ***Objectives:*** ***To assess the sucking reflex after giving sucking stimulation by rooting reflex stimulation, stimulation of suck point, tapping on lips & rubbing nipple on lips. To evaluate the effectiveness of sucking stimulation techniques by comparing mean pre & post sucking reflex scores of neonates. To evaluate the effectiveness of sucking stimulation techniques by comparing mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing.*** ***Method:*** ***An experimental approach with crossover design, sample was selected by probability sampling technique, sample size 120, tools used for data collection are demographic performa & Early feeding skill assessment Scale.*** ***Results:*** ***Results Showed Post-test sucking reflex scores was higher (41.08 ± 1.16 Vs 32.50 ± 2.55) than the pre-test, significant difference in mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing [F (4,595)=354.5, p>0.05].***

Keywords: Sucking reflex, sucking stimulation, sucking stimulation techniques, Neonate

1. Introduction

Sucking problem is a cause of concern for many new mothers. This problem is quite common in initial stages after birth or when introduced to bottle, to breastfeed. The reasons of baby not sucking properly are a greater concern for mothers.[1] Safe & successful oral feeding depends upon the proper development of sucking, swallowing & breathing & their coordination. In healthy term neonates mature sucking consists of a rhythmic alteration between suction & expression.[2] The baby can have many reasons for delayed or absent sucking reflex which includes a variety of causes.[3] A habit that develops in womb is when baby sucks his own tongue. This can then in turn also affect the breastfeeding relationship & cause some sucking problems.[4]

2. Background

Sucking stimulation techniques are very helpful to initiate breastfeeding after delivery especially in pre-term infants whose sucking reflex usually delays because of the delayed feeding due to neurological deficit.[5] It is an automatic & inborn response to a stimulus that involves a nerve impulse passing from a sensory nerve cells to a muscle or gland without reaching the level of consciousness.[6] These are defined as the act of initiating sucking reflex of neonates to develop a proper schedule for breastfeed.[7]

Research study at the Baby Gym institute SA has found that the following activities can help to stimulate the sucking reflex of neonates. These are encouraging the transition from being fed to actively feeding, in this body massage is given to the baby to make him more awake during the breastfeed initiation. In this technique the chin & the area around umbilicus is stimulated with hand rhythmically because the umbilicus is the part of nutrition during fetal life so it is helpful in initiating stimulation. Sucking is also stimulated by massaging the hands of baby & by applying pressure into the palm of their hand. This stimulation occurs due to the neurological connection between the hands & mouth. Stimulation of suck point that is touching the hard palate of baby's mouth also stimulates the suck centre & stimulates sucking reflex.[8] So, Stimulating the sucking reflex of babies will also give many benefits to mothers as like relieve of breast discomfort, relieve of breast engorgement, and relieve of breast pain due to milk secretion. This study will help the nurses & mothers directly & indirectly in stimulating the sucking reflex of babies by different methods that will enhance the knowledge & will improve the practice of breastfeeding.

3. Material & Methods

Research Design

In relation to the study crossover design was selected. In this study there were 4 types of sucking stimulation techniques that were used in stimulation of sucking reflex of neonates. The group received sucking stimulation by following techniques rooting reflex stimulation(A), stimulation of suck point(B), tapping of lips(C), rubbing of nipple on lips of baby (D). The sucking stimulation was provided at 4 different intervals. Technique (A) for 1 minute, (B) for 1minute, (C) for 1minute, (D) for 1 minute of duration by following sequence ABCD, BCDA, CDAB, DABC. Observations were done before starting the sucking stimulation & after giving every sucking stimulation techniques subsequently.

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Key:
A -Sucking stimulation by rooting reflex stimulation.
B- Sucking stimulation by stimulation of suck point with finger.
C- Sucking stimulation by tapping on lips.
D- Rubbing nipple on lips of baby.
O_1= Observation before introducing sucking stimulation techniques
O_2, O_3, O_4, and O_5:-These were the subsequent observations after a specified time period.

Sequencing	*Sucking stimulation time period & time duration*			
	Period-1 1 minute	*period-2 1 minute*	*period-3 1minute*	*period -4 1minute*
Sequence ABCD	A	B	C	D
Sequence BCDA	B	C	D	A
Sequence CDAB	C	D	A	B
Sequence DABC	D	A	B	C

Research setting
The study was conducted at Gian Sagar Medical College and Hospital & Rajindra Hospital of District Patiala, Punjab. Rajindra hospital is also a multispecialty 1250 bedded government hospital with high patient ratio.

Target population
The target population for a study is the entire set of individuals to be used to make inferences. In this study the target population was of neonates from birth to 48 hours of delivery.

Sample & Sampling Technique
In this study total 120 neonates from birth to 48 hours of life from the Gian Sagar Medical College & Hospital, Rajindra Hospital of Distt. Patiala were selected by using probability sampling technique. Firstly the researcher located the sample then checked for the inclusion criteria. After that random allocation of subjects was done by lottery method.

Inclusion criteria
1. Neonates born by Normal Vaginal Delivery.
2. Neonates born with Lower Segment Caesarian Section.
3. Pre-term neonates >34 weeks.
4. Out born neonates who have sucking problems.
5. Neonates born with instrumental delivery

Exclusion criteria
1. Pre-terms <32 weeks of gestation.
2. Meconium aspirated babies.
3. Sick neonate requiring mechanical ventilation.
4. Cleft lip & cleft palate.
5. Trachea-esophageal fistula & Atresia.
6. Diaphragmatic hernia.
7. Neonates who already initiated their feeding.
8. Whose parents do not agree to participate

Selection & development of tool
Tools were selected according to the objectives of the study. Demographic Performa to assess the characteristics of neonates & Early Feeding Skills assessment scale (EFS) was used to assess the sucking reflex of newborns & to evaluate the effectiveness of sucking stimulation techniques. Early Feeding Skills assessment scale (EFS) is a standardized tool & the demographic performa was developed after discussion with guide.

Score Interpretation
In the score interpretation part scores were 3, 2, 1. Score 3 was assigned to very good response, score 2 was assigned to fair response, 1 was assigned to poor response. Maximum score was 45 & minimum was 15.

Validity
Early Feeding Skills (EFS) assessment scale is a standardized tool developed by Suzanne Thoyre . The author did the validation of the tool with the help of experts from the scientific publication library the Cochrane reviews.

Reliability
The author of the tool Suzanne Thoyre calculated the reliability with the help of Kappa inter-rater reliability that is >0.80 & the tool was reliable. The reliability of the tool was also tested by the experts of Cochrane library & the author of the tool.

Pilot study
It was conducted on 12 subjects after obtaining permission from the concerned authority of hospital. It was conducted from 16th Feb to 21st Feb, 2015 at Gian Sagar Medical College & Hospital. The subjects were selected by probability random sampling technique.

Data Collection Procedure
A written permission was obtained from the concerned authority prior to the study. 120 samples were selected by researcher by using probability random sampling technique by lottery method. Parents and guardians of the neonates were explained about the purpose of the study & written consent was taken from them, parents information sheet was also provided to them for their knowledge in their respective language. Socio-demographic Performa & Early Feeding Skill assessment scale (EFS) was used by the researcher to assess the sucking reflex & effectiveness of sucking stimulation techniques. Then the researcher started data collection first observation was done by using the Early feeding Skill assessment scale. Subjects received sucking stimulation in their selected sequence of stimulation. Stimulation techniques were categorized as stimulating the rooting reflex (A), in this researcher rubbed the finger at the sides of the face of the neonate or touching the cheeks of the neonate, it was done for 1 minute & observation was done, stimulating the suck point (B), in this researcher rubbed the hard palate (upper palate) of the mouth of neonate with finger for 1 minute & observation was done. Third technique of sucking stimulation was tapping on lips (C), in this researcher tapped on the lips of neonates with finger for 1 minute, then observation was done. Fourth stimulation was done by rubbing the nipple on lips (D), in this researcher instructed the mother of the neonate to rub the nipple on lips of newborn before starting breastfeed, for 1 minute. These techniques were different for each counterbalancing. At last observation of subjects was done as post test by using Early Feeding Skill assessment scales (EFS).

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Ethical consideration

The study was started after the approval of the ethical committee of Gian Sagar Medical College & Hospital, Ram Nagar, Rajpura, District Patiala & concerned authorities of selected hospitals of Distt. Patiala Parents of the subjects were assured about the confidentiality of data collected.

Plan For Data Analysis

The data collected was planned to analyze in terms of objectives of the study by using descriptive & inferential statistics.

4. Results

Table 1: Frequency & Percentage Distribution of sucking reflex scores of neonates after giving sucking stimulation by Early Feeding Skill Assessment Scale (N=120)

Levels of sucking reflex	Scores	Neonatal f	sucking reflex %
Very Good	31-45	120	100
Fair	16-30	0	0
Poor	1-15	0	0

It shows that after getting the sucking stimulation techniques 120 (100%) neonates were having very good sucking reflex.

Section A: - Comparison of the mean pre & post sucking reflex scores of neonates

This section A includes comparison of mean pre-test & post-test sucking reflex scores of neonates to test the hypothesis that is stated below.

H_{01}: There is no significant difference in mean pre-test & post-test sucking reflex scores of neonates in terms of receiving sucking stimulation.

H_1: There is significant difference in mean pre-test & post-test sucking reflex scores of neonates in terms of receiving sucking stimulation.

Table 2: Comparison of the mean pre & post sucking reflex scores of neonates

Sucking reflex scores	Mean	SD	MD	t-test	P value
Pre-test	32.30	2.55	8.78	36.96*	0.000
Post-test	41.08	1.16			

df=119 Table Value1.96 *=Significant

Table shows that post-test sucking reflex scores was higher (41.08 ± 1.16 Vs 32.50 ± 2.55) than the pre-test. For testing the hypothesis t-test was applied & it was concluded that there is significant difference in mean pre-test & post-test sucking reflex scores of neonates in terms of receiving sucking stimulation techniques [t=(df=119) 36.96, p<0.05]. These findings were found significant so H_{01} rejected, Hence, it is concluded that sucking stimulation techniques are effective on sucking reflex of neonates.

Section B: - Comparison of the mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing.

H_{02}: There is no significant difference in mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing.

H_2: There is significant difference in mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing.

Table 3: Comparison of the mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing (N=120)

Source of variation Value	SSQ	df	Mean Sum of Squares	F	P
Between groups	6304.4	4	1576.0	354.5*	<0.001
Within groups	2645.5	595	4.45		
Total	8949.9	599			

F tab= (4, 595) =6.26 *=Significant at 0.05 level

Repeated measures ANOVA was used to test the differences in mean post neonatal sucking reflex scores of neonates after receiving all type of sucking stimulation techniques. It was found that there is significant difference in mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing [F (4,595)=354.5, p>0.05]. Calculated values found significant so H_{02} rejected

Table 4: Pair wise comparison of the mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing

Observation	Pairs	MD	P value
O_2	O_3	-0.58*	.000
	O_4	0.36*	.000
	O_5	0.92*	.000
O_3	O_4	0.94*	.000
	O_5	1.5*	.000
	O_2	0.58*	.000
O_4	O_5	0.56*	.000
	O_2	-0.36*	.000
	O_3	-0.94*	.000
O_5	O_2	-0.92*	.000
	O_3	-1.5*	.000
	O_5	-0.56*	.000

Post-hoc test was applied to test the differences in the mean post neonatal sucking reflex scores in between the pairs as shown in the table. When analysis performed it was found that there is a significant difference in the mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing.

5. Discussion

The findings of the study reveals that Post-test sucking reflex scores was higher (41.08 ± 1.16 Vs 32.50 ± 2.55) than the pre-test. The comparison of mean pre-test sucking reflex scores of neonates before the administration of sucking stimulation techniques & post-test sucking reflex scores of neonates after the administration of sucking stimulation techniques was done through Early Feeding Skill assessment Scale. It was concluded that there is significant difference in mean pre-test & post-test sucking reflex scores of neonates in terms of receiving sucking stimulation techniques (t= -36.962, p<0.05). These findings were found significant, it

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was concluded that sucking stimulation techniques were effective on sucking reflex of neonates. Similar study was conducted by **Fucile** et al on 75 infants these were at high risk of encountering the feeding difficulties. This was concluded that the early sensorimotor interventions may improve oral feeding skills in infants & sucking reflex of the infants. The suck & swallow ratio & stability of suck – swallow intervals differ a lot in the infants as compared to the babies born with normal vaginal deliveries($p \geq 0.181$,ES ≤ 0.3).

Similar study was reported by **Hwang**[47] to assess the effects of sucking stimulation techniques. In this study crossover design was used 19 preterm & 20 full term babies. A 5-min oral stimulation program was applied to infants prior to feedings in two of 4 feedings on two consecutive days. After receiving the oral stimulation, a higher percentage of infants moved to the drowsy or quiet alert state from sleep or restlessness before feeding, both on day 1 ($P=0.016$) as well as day 2 ($P=0.016$).similar results found in study conducted by **Lima AH** et al[49] in newborns.Sample was composed of 64 newborns that were randomly divided into 3 groups. First group received nutritive sucking with breastfeeding, second group received non-nutritive sucking with little finger, third group received no stimulation that act as control group. As a result of the study nutritive as well as non-nutritive suction methods provided a comforting effect response scores & advancement in sucking reflex of neonates.($P < .05$).

Further Comparison of the mean post neonatal sucking reflex scores of various neonates randomly assigned to various counterbalancing was done by using repeated measures Anova & Post-hoc test to see the differences in sucking reflex scores of neonates pair wise. After calculating the Anova the findings were found significant. The sum of squares between the group was 6304.4, mean sum of square was 1576, df=4. The sum of squares within group was 2645.5, mean sum of square was 4.45, df=595. The $F = 354.5$ ($p=.000$). After the analysis it was concluded that there is significant difference in mean post neonatal sucking reflex scores of neonates. After calculating the Anova, as a result of post-hoc test significance difference was noted in the post neonatal sucking stimulation scores of various neonates randomly assigned to various counterbalancing. The pairing was done on the basis of the findings H_{02} was rejected & research hypothesis was accepted. It was concluded that sucking stimulation is effective on sucking reflex of neonates.Another study on sucking stimulation techniques by **Fucile** et al in which a randomized control trial was used. In this study an oral, tactile, combined interventions were used. 75 infants were selected as sample (49 males, 26 females) who were randomly assigned to experimental group & a control group was also selected. As a result of sucking stimulation experimental group had more advanced sucking stages than the control group. A study was conducted by **Medoff-cooper** et al, a 5 minute sucking assessment was done on the first & second day of life. Instruments used for assessment were Infant Nutritive Sucking Apparatus & the Anderson Behavioral Assessment Scale. Results showed significant alert behavior from first to second sucking ($p<.01$), increased suck bursts ($p<.001$). the number of sucks ($p<.001$), intersuck width($p=.008$), interburst width ($p<.05$). On the second day of life the infants generated significantly more sucks due to the use of Infant Nutritive Sucking Apparatus (INSA) as sucking stimulator.

6. Conclusion

The conclusion was based on findings of the study. The results showed the significant differences in sucking reflex scores of neonates, thus showed the effectiveness of the sucking stimulation techniques. t-test was used to test the differences in the mean pre and post sucking reflex scores of neonates & it was found significant at 0.05 level of significance. In this study the effectiveness of sucking stimulation techniques were also seen. To test the differences in mean post neonatal sucking reflex scores of neonates assigned to various counterbalancing, repeated measures Anova & Post-hoc test was used. Findings were significant & revealed the effectiveness of sucking stimulation techniques.

References

[1] Lau C. Sucking & swallowing disorders in the newborn. Sucking & swallow disorders in the newborn [online] 1996 [2014 Feb 13]; [2 pages]. Available from: URL:http://www.uptodate.com/.../
[2] Nagim MK. Sucking problems & breastfeed. [online]. 2008 [2014 Feb 13]; [5 screens]. Available from: URL:http://www.breastfeeding.about.com/ breastfeeding
[3] Behar TA. Suck problems during breastfeed. [online]. 2008 [2014 Feb 13]; [2 screens]. Available from: URL:http://www.breastfeeding problems.com/suck problem.htm
[4] Behar TA. Weak suck breastfeeding problems. [online]. 2008 [2014 Feb 13]; [2 screens]. Available from: URL:http://www.breastfeeding problems.com/weak_suck.htm
[5] Slattry J et al. Early sucking & swallowing problems as predictors of neurodevelopment outcome in children with neonatal brain injury. 2007 Apr;26(3):250-55
[6] India Parenting. Reasons for a baby not sucking properly. [online]. 2007 [2014 Feb 15]; [2 pages]. Available from: URL: http://www.indiaparenting .com >baby's diet>breastfeeding
[7] Bubhub home. Poor sucking reflex. [online]. 2008 [2014 Feb 15]; [2 screens]. Available from: URL: http://www.bubhub.com.au>...>bottle feeding support
[8] Babygym. Stimulating the sucking reflex of neonates & infants. [online]. 2011 [2014 Feb 15]; [1screen]. Available from: URL: http://www.babygym.co.za//whykids_stimulating_the _sucking reflex
[9] Pimenta HP. Sucking in pre-term newborns & the sucking stimulation. 2006 Oct;96(10):1430-2
[10] Arvedson J. An evidenced based review on sucking sitmulation. 2009 Dec;24(6):1110-8
[11] Fucile S, McFarland DH, Gisel EG. oral & nonoral sensorimotor interventions facilitate suck swallow respiration functions & their coordination in pre-term infants. 2008 Oct;28(4):247-57

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[12] Hwang YS et al. Effects of pre-feeding oral stimulation on feeding performance infants. 2008 Sep-Oct;84(5):423-27
[13] Lima AH et al. Efficacy of nutritive & non-nutritive sucking stimuli. 1992; 81:287-91.
[14] Fucile S, McFarland DH, Gisel EG. oral & nonoral sensorimotor interventions facilitate suck swallow respiration functions & their coordination in pre-term infants. 2008 Apr;28(4):247-57
[15] Medoff C, Bilker W. Kaplan JM. Sucking patterns & behavioural statein 1 & 2 old full term infants. 2010 Sep;42:235-39.

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