Effects of Breast Massage on Breast Milk Expression among the Mothers of Pre-Term Baby

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Abstract

A study was conducted to find out the effect of breast massage on breast milk expression on the mother of pre-term baby who were admitted in NICU in IMS and SUM Hospital of Bhubaneswar. A quantitative quasi experimental research design was adopted; 50 mothers were selected in the study who met the inclusion criteria. Self-structured questionnaires were used for collecting socio–demographic data and a checklist was used for collecting the regular breast milk amount after breast massage. Most of the samples were 25 years to 35 years (48% in experimental group and 44% in control group) in this age group; 60 percent of mothers were from joint family in experimental group and 56 percent from nuclear family in control group; 40 percent of mothers were illiterate in experimental group and 44 percent mothers had taken primary education in control group; 68 percent of mothers were housewife in experimental group and 52 percent in control group; 76 percent of mothers were primipara in experimental group and 52 percent were multipara in control group; 65 percent mothers had normal delivery in experimental group and 60 percent in control group; 96 percent mothers had spontaneous pregnancy in experimental group 96 percent of mother had no complication during pregnancy in experimental group. All (100%) of mothers had no complication during pregnancy in control group. In unpaired 't' test, there was statistically significant relationship between the control group and post-interventional experimental group. Unpaired t test value was 7192.052 (p<0.0001) i.e. statically significant relation on breast milk expression. The expression of 1st and 2nd day 't' value was 2.86 (p=00086), which is statistically significant, in the expression of 3rd and 4th day 't' value was 8.74 (p=< 0.0001), which is extremely significant in the expression of 10th and 11th day 't' value was 7.114 (p<0.0001), which is extremely significant and in the expression of 12th and 13th day 't' value was 18.697 (p=<0.0001), which is extremely significant.

Motherhood is an unforgettable gift and advantage that a mother holds nearest to her heart. Experiencing motherhood is fearless positive quality, to be continuous guide and supporter for every milestone of the children. It is reflects unconditional love that does not end; the reminiscences are truly beyond any price.

The nutritional need of pre-term baby is quite unique. Pre-term baby's mother's milk is packed with full nutrition, i.e. containing 4.2 gm/100 ml of fat (trace of fatty acid, 0.6 gm of polyunsaturated fatty acid and 0.016 gm of cholesterol), 1.1 gm/100 ml of protein (0.4 gm of casein, 0.3 gm of α-lactoalbumine, 0.2 gm of lacto ferrin), 7.5 gm/100 ml carbohydrate (7 gm of lactose and 0.5 gm of oligosaccharides), (0.157 gm/100 ml of minerals (0.03 gm of calcium, 0.014 gm of phosphorous, 0.015 gm of sodium, 0.055 gm of potassium and 0.043 gm of chlorine) are present (Moori, 2017).

The pre-term baby faces many problems in the feeding of breast milk. Most premature babies experience sucking difficulty, they cannot suck properly the entire milk from the breast. Another problem is tongue thrashing i.e. the baby repeatedly thrusts out his or her tongue while trying to catch the nipple. Primies are more prone to acid reflux. Some premature babies may fall asleep more often during feeding.

According to WHO, in 2016 an estimated 15 million babies across the world were born pre-term. Highest number of pre-term babies are born in India (approximately 3,519,100).

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Review of Literature

Divya A, Biswanath L, Philip A (2016) conducted a quasi-experimental study among 30 post-natal mothers whose baby was admitted in NICU. Breast massage was done for 10 minutes before each expression and it was observed by the use of checklist after every expression; analysis was performed in mean frequency and paired t test. The results showed mean pre-test volume of breast milk expressed in ml as 7.33±4.86 which increased to 15.56 ±8.38 (t = 4.22, p=0.001) after the intervention. The breast milk expression in post-test was 37.6 ± 3.88 significantly more than the

pre-test 28.4 ± 4.73 (t =11.25, p= 0.001). The study demonstrates that the breast massage is effective in increasing the amount of expressed breast milk.

Rahman (2012) conducted a study on 30 post-natal mothers with babies having mild breast engorgement. Storr breast engorgement scale, Numerical pain ratting scale, Digital pH meter, Structured checklist on sucking speed and LATCH system and structured interview schedule were used. The breast massage was done for 10 minutes before each expression for three consecutive days. Results showed significant difference between pre-test score and post-test score from the day of 1-3 which was proved to be statistically significant. By numerical pain rating scale 't' value was 19.7 at level of 0.05 significance, for the pH of breast milk 't' value was 7.67 at the level of 0.05 significance and in the suckling speed of neonate 't' value was 7.86 at the level of significance.

According to a report published in *The Hindu*, 6 Sept 2016, India is experiencing greatest number of deaths due to the birth of premature baby, and is having the 36th rank in the list of pre-term births globally. The rankings are for 199 countries. In these, 27 million babies have taken birth in India (WHO, 2013). Annually, 3.6 million babies are born prematurely, of which 303,600 are unable to survive due to some complications. Of these, many babies die due to low intake of breast milk.

Objectives

The study was undertaken to compare the breast milk expressed (1) between the control group and the experimental group after the breast massage, (2) on alternate days in experimental group after the breast massage.

Hypotheses

H01: There is no significant difference of breast milk expression between control and experimental group after administration of breast massage.

H02: There is no significant mean difference of breast milk expression on alternate days in experimental group after the breast massage.

To test the above hypothesis, we formulated the research hypothesis such as:

H11: There is significant difference of post-test breast milk expression between control group and experimental group.

H12: There is significant mean difference of breast milk expression on alternate days in experimental group after the breast massage.

Ethical Consideration

Permission was taken from (a) college authority to conduct the research, (b) the hospital superintendent to conduct the study in IMS & Sum Hospital, and (c) the head of the Neonatal ICU. Consent was obtained from the mother of the pre-term baby. The participants were explained that their daily routine will not be hampered in this study and that they could withdraw from the study at any time.

Need of the study: The premature baby are heterogeneous group with wide differences in their needs of nutritional and immune protection due to developmental delays and late onset of sepsis decreased gestational age and low birth weight such babies require additional care. Breast milk develops proteins and higher level of bio active molecule which are essential for the growth of the baby.

Beiqi Jiang, Jing Hua & Liping Zhu performed a prospective cohort study in which 400 samples were selected. These were divided into three groups in which breastfeeding, breast milk expression by breast massage and direct breast feeding were performed. The experiment was performed for 6 weeks. It found that the mother with breast milk expression had shortest duration of breast feeding than the other two groups (Becker et al, 2015).

Materials and Methods

The design of the present research study was quasi-experimental. It contained two groups, experimental and control group. The experimental group contained the mother of the pre-term baby who were given breast massage before every breast milk expression and the control group contained the mothers who were not breast massaged before every breast milk expression. The study was conducted in IMS and SUM Hospital from 1 March 2019 to 1 June 2019. The population included all the mothers of pre-term babies admitted in NICU. The study contained 50 mothers, 25 each from experimental and control group. Purposive sampling technique was used for the study.

The tools were mainly based on related reviews of literature received from books and journals, the first draft tool with the help of the research guide, formal and informal discussion with the peer group, preparation of blue-print, establishment of content validity and some modifications were done and some items were included experts' suggestions, presentation of the tool, reliability of the tool and development of final tool.

The tool had two sections; the first section contained all the socio demographic variables like age, type of family, educational status, occupation, parity, type of delivery, type of pregnancy and history of co-morbid disease conditions. The second section contained the mothers who were given breast massage before breast milk expression and its effectiveness was assessed by using check list. The steps of the massage were shown to the participants through the video, after that demonstration was done by the researchers.

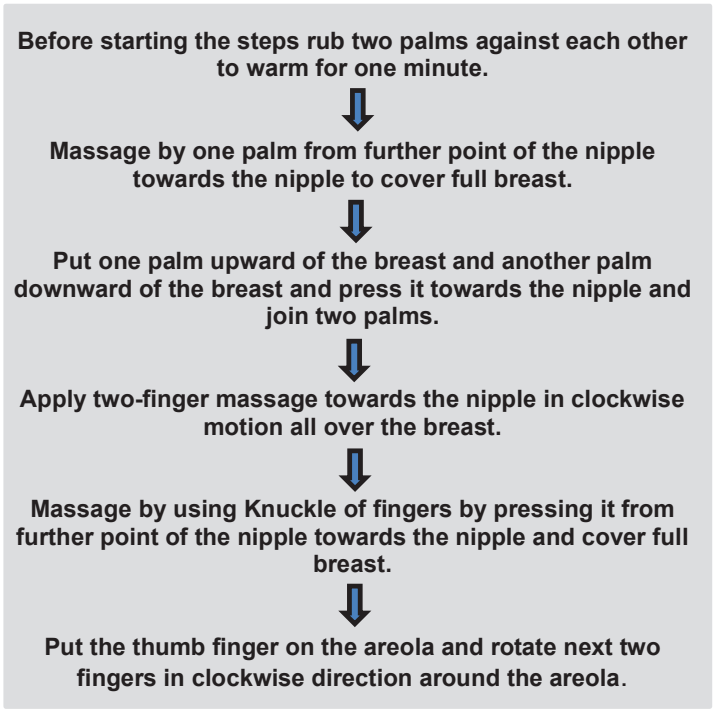

Fig 1: Intervention followed for mothers.

Intervention procedure: Data was collected, recording the amount of breast milk secreted after each expression with each massage in the checklist. The data was collected for 14 days. The milk was expressed eight times each day at three hours intervals at 9 am, 12 noon, 3 pm, 6 pm, 9 pm, 12 midnight, 3 am, 6 am and breast massage was performed for 5 minutes before each expression.

Earlier, the mothers of pre-term babies admitted in NICU were selected. Then the procedure and all the five steps were explained to the mothers. Each step was of one minute (Fig 1). Then the mothers were told to express the breast milk into the container. Breast massage was given before breast milk expression and its effectiveness was assessed by using check list.

Results

Distribution of the subjects as per socio demographic variables using frequency and percentage

Experimental group: According to demographic variables, 48 percent of females were between 25 to 35 years of age, 60 percent belonged to joint family, 40 percent were illiterate, 68 percent were housewife, 76 percent were primipara, 65 percent had normal delivery, 96 percent had spontaneous pregnancy, none (0%) had any co morbidity disease and 96 percent of females had complication during pregnancy (Table 1).

Control group: As for demographic variables, 44 percent females were aged 25 to 35 years, 56 percent belonged to nuclear family, 44 percent were primary educated, 52 percent were housewife, 52 percent were multipara, 60 percent had normal delivery, 100 percent had spontaneous pregnancy,100 percent of females had no any co-morbid disease, 100 percent of females had no complication during pregnancy.

Comparison of control group with post-intervention experimental group

Table 2 reveals that the research hypothesis (H01) is accepted, and the null hypothesis (H02) is rejected. The calculated 't' value is 152.5775 ($p<0.0001$) by degree of freedom 48 i.e., statically significant relation on breast milk expression with breast massage effectively increases the breast milk production.

Breast milk expression on alternate days after breast massage by paired 't' test

Table 3 reveals that the present research study re-

Table 1: Distribution of experimental and control group according to demographic variables (n1=25, n2=25)

Sample characteristics	Experimental Group f	%	Control Group f	%
Age (in years)				
a) <18 years	2	8	6	24
b) 18 - 25 years	11	44	8	32
c) 25 - 35 years	12	48	11	44
d) >35 years	0	0	0	0
Type of family				
a) Joint family	15	60	11	44
b) Nuclear family	10	40	14	56
Educational status				
a) Illiterate	10	40	5	20
b) Primary education	5	20	11	44
c) Secondary education	6	24	6	24
d) Graduate and other	4	16	3	12
Occupation of mother				
a) Service	2	8	5	20
b) Self-employed	6	24	7	28
c) House wife	17	68	13	52
d) Wedge labourer	0	0	0	0
Parity of mother				
a) Primipara	19	76	12	48
b) Multipara	6	24	13	52
Type of delivery				
a) Normal delivery	16	65	15	60
b) Assisted vaginal delivery	9	35	10	40
Type of pregnancy				
a) Spontaneous	24	6	25	100
b) IVF	1	4	0	0
History of co-morbid disease				
a) Yes	0	0	0	0
b) No	25	100	25	100
Complication during pregnancy				
a) Yes	1	4	0	0
b) No	24	96	25	100

Table 2: Comparison of control group with post-intervention of experimental group by unpaired "t" test (n_1+n_2=25 +25=50)

Variables	Mean	MD	SD	SE	Calculated 't' value	DF	p Value
Post intervention of experimental group	3342.1200	67.96	13.592	2195.92	152.5775	48	<0.0001*
Control group	1146.2000	23.66	4.732				

** Highly significant p <0.0001*

Table 3: Comparison of the breast milk expression on alternate days in experimental group after the breast massage by paired 't' test (n=25)

Variables	MD	SD	SE	Calculated 't' value	DF	p Value
1st and 2nd day	14.96	26.14936	5.22	2.86	24	=00086*
2nd and 3rd day	5.88	23.74749	4.74	1.23	24	0.2306
3rd and 4th day	0.16	43.74612	8.74	54.68	24	=<0.0001**
4th and 5th day	5.2	32.84739	6.57	1.26	24	0.2198
5th and 6th day	210	119.2861	23.85	0.1136	24	0.9105
6th and 7th day	3.68	13.1583	3.57	0.9716	24	0.3089
7th and 8th day	2.48	16.2021	3.24	1.3066	24	0.2037
8th and 9th da	4	28.3945	5.67	1.416	24	0.1696
9th and 10th day	2.8	23.2325	4.64	1.6952	24	0.1029
10th and 11th day	0.8	28.45611	5.69	7.114	24	<0.0001**
11th and 12th day	3.4	30.54096	6.108	1.796	24	0.0851
12th and 13th day	0.2	18.6793	3.73	18.697	24	<0.0001**
13th and 14th day	2.6	19.4250	3.88	1.4942	24	0.1482

**Statistically significant p=00086; **Highly significant p=<0.0001*

vealed the comparison of the milk expression of alternate days which shows that in the expression of 1st and 2nd day 't' value is 2.86 (t48=2.86, p=00086) which is statistically significant, in the expression of 3rd and 4th day 't' value is 8.74 (t48=8.74, p≤0.0001) which is highly significant, in the expression of 10th and 11th day 't' value is 7.114 (t48=7.114, p<0.0001) which is highly significant and in the expression of 12st and 13th day 't' value is 18.697 (t48=18.697, p=<0.0001), which is highly significant.

Discussion

In the experimental group 48 percent mothers were between 25 to 35 years of age, 60 percent belonged to joint family, 40 percent were illiterate, 68 percent housewife, 76 percent primipara, 65 had normal deliver, 96 percent had spontaneous pregnancy, none (0%) had any co morbid disease and 96 percent mothers had complication during pregnancy.

In the control group, 44 percent mothers were under the age of 25 to 35 years, 56 percent belonged to nuclear family, 44 percent were primarily educated, 52 percent were housewife, 52 percent were multipara, 60 percent had normal delivery, all (100%) had spontaneous pregnancy, none (0%) had any co morbid disease, and none (0%) had any complication during pregnancy.

Unpaired 't' test for comparing breast milk expression of control group and post-interventional of experimental group. The unpaired 't' test for comparing the milk expression of control group and experimental group after breast massage statically significant with relation on breast milk expression with breast massage effectively increased the breast milk production. Paired 't' test for comparing breast milk expression on alternative days showed mean pre-test volume of milk expressed in ml as 2.86±26.14 ± (t=2.86, p=0.00086), which increased to 1.49 ±19.42 (t = 18.697, p≤0.0001), after the intervention. Paired 't' test for comparing breast milk expression due to breast massage on alternative days was statistically significant.

The present study is supported by similar studies (Divya et al, 2016; Rahman & Chhuganu).

Conclusion

Breast massage is effective in increasing the breast milk amount after each expression. The significant associations are: age, type of family, educational status, occupation, type of delivery, parity, type of pregnancy, co morbid disease and any complication during pregnancy.

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