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## Review article: Effect of traditional breast stimulation techniques on lactation outcomes

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### Abstract

Maintenance of lactation during adverse neonatal conditions is a challenge to every NICU mother and expressed breast milk is vital for the recovery of majority of NICU babies. Therefore ensuring adequate quantity of expressed breast milk is a great responsibility that lies with NICU professionals. Many adjuvant techniques are proved to be cost effective in improving the quantity of expressed breast milk. However adjuvant methods for expression of breast milk are underutilised in many of the healthcare settings and these practices needs to be strengthened.

**Keywords:** Traditional breast stimulation techniques, lactation outcome, quantity of expressed breast milk

### Introduction

Breast milk is the most ideal and exclusive nutrient for the New born with incredible health benefits and is an essential component of New born care. Certain circumstances demands. New borns to be fed with expressed breast milk as they cannot be fed at breast directly at birth. Therefore methods of expressing milk need to be evaluated for ensuring the quantity and quality of expressed breast milk as it is vital for the survival of vulnerable new borns. The mothers of infants who are dependent on expressed breast milk often find difficulty to express adequate quantity of breast milk to ensure exclusive breast feeding to their babies and it has become a major stress factor among these mothers. Many cost effective adjuvant techniques are proved to be very useful in improving the quantity and quality of expressed breast milk.

### Objectives

To assess the effectiveness of traditional breast stimulations techniques adopted as adjuvant techniques to breast milk expression on quantity of expressed breast milk and other lactation outcomes

### Search methods

Studies were identified by searching the published studies through the following data bases in July 2019

- Pub med
- NML Online sites
- Medline
- Cochrane
- Research Gate

### Selection criteria

Randomised and quasi randomised trials comparing effects of traditional techniques of breast stimulation as adjuvant technique to methods of breast milk expression at any time of postnatal period

- Study type: Experimental or quasi experimental studies.
- Study participants: Mothers who are lactating or expressing breast milk at any time of postnatal period. Exclusion were placed on studies which are not studying the effects of interventions on lactation and its outcomes.
- Interventions: Traditional techniques for stimulating breast milk expression such as back massage, liver point massage, breast massage and warm compress was.

- Primary outcomes: Effect on quantity of breast milk expressed or fed
- Secondary outcomes: effects on maternal outcomes and neonatal outcomes

### Data collection and analysis

Two review authors independently reviewed each studies for assessing their suitability for inclusion in the review. This Review included three experimental trials and five quasi experimental trials done on lactating women in postnatal period and were conducted in various settings such as neonatal units /post natal wards /milk banking facility of tertiary health care hospitals in abroad and India. The studies were examined for effects of various traditional methods such as back massage, liver point massage, breast massage, and warm compress as adjuvant techniques for breast milk expression as primary outcomes and also for other secondary outcomes such as maternal comfort, maternal breast pain and neonatal outcomes. Five studies included in the review was examining effects of various methods of massages on breast milk volume and two studies were on effect of warmth on breast milk volume. The findings of the various studies could not be pooled together due to heterogeneity in participants, interventions and outcome measured or reported. Most of the results were derived from single studies.

### Main results

#### Reviews related to methods of massages and effects on lactation, neonatal and maternal outcomes

A quasi experimental study done on total 220 mothers in two non-equivalent group groups (Experimental group: 100 and control group: 120) selected using purposive sampling for assessing the effectiveness of back massage on lactation among immediate post natal mothers. This study done on Obstetrics and paediatric departments at a tertiary teaching hospital in central India from July 2011 to Oct 2012 and measured the neonatal outcomes such as post feed weight gain, number of urination and stools passed, duration of post feed sleep and satiety after feeds. The results brought out that mean post feed weight by experimental group when compared to the control group was higher on day three of the intervention and the difference was found statistically significant at 0.05 level. The mean difference in stool frequency on third day was also has significant statistical difference at 0.05 level between the groups and was higher in experimental group Duration of post feed sleep and neonatal satisfaction were higher in the experimental group and found statistically significant at a level of 0.05. All the findings of the study were supporting the hypothesis that back massage improves lactation and concluded that this can be recommended for all breastfeeding mothers, especially for those facing the problems in initiating and sustaining breast feeding. Importantly, this is a simple method which can be implemented using the existing healthcare personnel, without straining resources, Another randomised control trial conducted to explore the effect of point massage of liver and stomach channel combined with pith /trotter soup on prevention of delayed lactation. 320 lactating women were randomly enrolled in to the study and were equally divided in to four groups each having 80 participants such as one control group and three experimental groups for interventions (point massage, pith and trotter soup, combination of massage with massage and

Soup). This study revealed that women in all three experimental group had earlier initiation time of lactation. There were significant difference between experimental group with combination of point massage and pith trotter soup and experimental group with only pith trotter soup and the study could not find significant differences between only pin point massage group and only pith and trotter soup group. Author of this study concluded that point massage of the liver and stomach channel is easy to operate and has preventive effect on delayed lactation initiation and also suggested that the application of point massage might be useful for preventing lack of milk in postpartum due to delayed lactation initiation and improving the exclusive breast feeding rate. Impact of unilateral breast massage on breast milk output among postnatal mothers were assessed by conducting a quasi-experimental study done on 42 postnatal mothers those who admitted in new born care units and visited the milk bank facility for breast milk expression at a tertiary health care hospital in Telangana, India. After enrolment in to the study the participants were assessed for volume of milk expressed after breast massage. The participants served as their own control during intervention. The results of this study revealed that the median volume of breast milk expressed from the intervention breast and control breast were statistically different ( $p < 0.001$ ) and were higher in the intervention breast. The study concluded that breast massage increases the volume of breast milk production and also suggests further studies to explore the local factors playing responsible for increased breast milk supply after breast massage. Another quasi experimental study was conducted to identify the effect of breast massage on expression of breast milk among mothers of neonates admitted in neonatal intensive care unit of a tertiary level health care set up in India. This study assessed the effect of breast massage in terms of volume of expressed breast milk, pain during breast milk expression and experience of breast milk expression. Thirty postnatal mothers were included in the study using convenient sampling method and the study followed a time series design. The results brought out that the post-test volume of milk (15.56+ 8.38) is significantly ( $t = 4.22$   $p = 0.001$ ) higher than the pre-test volume (7.33+ 4.86) of milk. This study also revealed that the post-test pain score was significantly lower than the pre-test and the difference was statistically significant ( $t = 11.73$   $p = 0.001$ ) and the maternal score on experience on breast milk expression was significantly higher in the post test than the pre-test. This study also concluded that breast massage helps in improving breast milk expression experience and is a cost effective intervention. A randomised control trial was also conducted in Neonatal intensive care unit, North Stavordshire Hospital NHS Trust to compare the methods of milk expression after preterm delivery and compared the effect sequential and simultaneous breast pumping on volume of milk expressed and its fat content. This study also assessed the effect of breast massage on milk volume and fat content. As sequential random sampling method included total 36 women divided in to two interventional group for simultaneous breast pumping (19 participant) and sequential breast pumping (17 participants) respectively. The results revealed that Milk yield was significantly increased in group intervened with simultaneous pumping when compared with group with sequential pumping. In both intervention group massage proved to be an effective adjuvant measure to increase the milk yield. There was no

significant change in fat concentration in the milk as it was not affected by the increase in volume achieved by the interventions. Study concluded that simultaneous pumping is more effective for producing milk than sequential pumping and that breast massage has an additive effect, improving milk production in both groups. As frequent and efficient milk removal is essential for continued production of milk, mothers of preterm infants wishing to express milk for their sick babies should be taught these techniques. A randomised control study to determine the effect of breast Oketani-massage therapy on neonatal weight gain among lactating women with breast engorgement was conducted on 100 women in their early postpartum period admitted due to breast engorgement to Imam Reza Hospital, from August to November 2016. The subjects were divided into two groups to receive the Oketani massage and routine care training respectively through random block allocation. Neonatal outcome under observation was weight gain and the results revealed no significant difference between the two groups in terms of neonatal weight gain during the initial post intervention days. However there was significant ( $P<0.001$ ) increase in weight gain among new borns of mothers who received Oketani massage during later days (14 and 28 days) of post-intervention. This study concluded that breast Oketani-massage in comparison to the routine care increased the neonatal weight gain among lactating women with breast engorgement and Oketani breast massage could be used as an easy-to- method. The study suggested that this alternative method can be also recommended for mothers suffering from breast engorgement. It also recommended further investigations to assess the effect of Oketani breast massage therapy concurrently on the quality of breast milk and neonatal weight gain among mother with breast engorgement.

#### **Reviews related to warmth application and effects on lactation, neonatal and maternal outcomes**

Quasi experimental study was conducted to assess effect of using a warm breast shield on the efficiency, effectiveness, and comfort of expressing milk with an electric breast pump among lactating mothers of infants who were predominantly breast milk fed. This study was done on selected mothers who were exclusively breastfeeding, breastfeeding and expressing breast milk, or exclusively expressing breast milk to assess the effect of warming the areola and nipple during expression using an electric breast pump on the time taken to elicit a milk ejection reflex, the total milk yield and percentage of available milk removed, and the rate of removal of milk and also for determining if there is an interaction between warmth and strength of vacuum. The effect of changing temperature on milk duct diameter; and mothers' perceptions of using a warmed breast shield were also evaluated in this study. The results brought out the fact that using a warm breast shield effectively warmed the nipple and areola and, combined with maximum comfortable vacuum, decreased the time to remove 80% of the total milk yield and increased the percentage of available milk removed after 5 minutes of expression, with no change in the percentage of available milk removed after 15 minutes of expression compared with an ambient-temperature breast shield. The average diameter of the ducts in the nipple of the mothers also significantly ( $P<.001$ ) changed when warm breast shield was used. The data confirmed that use of the mother's maximum comfortable

vacuum was more efficient and using a warm breast shield with an electric breast pump was comfortable and improved the efficiency of milk removal. The average comfort rating of the warm shield was 4.6 (0.2), with a range of 3 (neutral) to 5 (very comfortable) and there were no negative comments about the warmed breast shield. This study concluded that using the warm breast shield resulted in some significant indicators of increased efficiency of milk removal. This study also could provide evidence for a possible mechanism for this efficiency by measuring the effect of temperature on the diameter of the milk ducts in the nipple that may control of the flow rate of milk through the nipple. In addition, mothers found the warmed breast shield to be comfortable. Another quasi experimental study analysed the effect of Warming up breasts on the amount of breast milk among Thirty-nine mothers whose babies had been admitted to the neonatal intensive care unit. The amount of breast milk that was obtained from warmed breasts was significantly higher than that obtained from non-warmed breasts (maximum,  $47.02\pm 23.01$  mL vs.  $33.15\pm 19.98$  mL) ( $p=0.000$ ). This study concluded that warming up breasts by a breast compress is easy and affordable, and this procedure increases the amount of breast milk, thus facilitating infant nutrition and recovery especially in the neonatal intensive care unit.

#### **Summary and Conclusion**

Increasing the amount of breast milk is vital for both nursing mother and new born. Mothers of those babies admitted in neonatal intensive care unit (NICU) are in severe stress because of poor maternal child bond, disturbed physical appearance of baby and inability to feed their baby. Ensuring the amount and quality of expressed breast milk is vital for the survival of vulnerable new borns. Interventions that are economical and easily adaptable can will be boom for mothers practicing breast feeding to improve lactation and compliance to exclusive breast feeding practices. Mothers who are experiencing difficulty to express adequate breast milk to feed their new borns should be taught adjuvant techniques to improve lactation and its outcomes. Traditional breast stimulation techniques are found to be simple and inexpensive and can be practised with ease and therefore proved to be more affordable and acceptable option by the lactating population. This systematic review reviewed eight studies conducted on lactating women in postnatal period assessing various effects of cost effective traditional interventions on lactation and its outcomes. Out of seven studies which examined the effect of massage on lactation throws lights on the fact that various massage techniques like back massage, point massage on liver has a positive outcome on lactation and its outcomes such as volume of milk expressed, neonatal weight gain, neonatal sleep and satisfaction and maternal comfort. Breast massage was proved to be very effective in improving the quality and quantity of breast milk expressed or fed by the postnatal women and has improved the maternal comfort and neonatal outcomes. Two quasi experimental studies examined the effect of warmth on lactation and its outcome. Both the studies brought out that application of warmth increased the amount of breast milk and is a very convenient method for postnatal mothers to tackle problems of inadequate breast milk supply, breast engorgement and pain. Traditional techniques of breast stimulations improved lactation outcomes and found to be having positive effect on neonatal

outcomes and maternal outcomes. More studied should be conducted on traditional breast stimulation techniques to improve its generalization with large samples across various settings so that breast feeding practices of the postnatal population can be improved.

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