

Original Article

EFFECT OF IMMEDIATE SKIN TO SKIN CONTACT AND EARLY INITIATION OF BREASTFEEDING IN NEWBORNS

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Abstract

Birth and immediate postpartum period pose many challenges for the newborn. The neonatal mortality rates are high in India, whereas the breastfeeding rates are still low. Hence, need exists for a simple and easily applicable intervention, which may counter these challenges. **Aims:** The present study was undertaken to evaluate the effects of very early skin-to-skin contact (SSC), in term babies with their mothers, on success of breastfeeding and neonatal well-being. **Materials and Methods:** This study is randomized control trial conducted over 2 years period in a tertiary care hospital. Healthy babies delivered normally were included. Very early SSC between mothers and their newborns was initiated in the study group. We studied effective suckling (using modified infant breastfeeding assessment tool [IBFAT]), breastfeeding status at 6 weeks, maternal satisfaction, thermal regulation, baby's weight and morbidity. **Statistical Analysis:** *T*-test, Pearson Chi-square test and non-parametric Mann-Whitney test were used through relevant Windows SPSS software version 16.0. **Results:** We observed that SSC contributed to better suckling competence as measured by IBFAT score ($P < 0.0001$). More babies in the SSC group were exclusively breastfed at first follow-up visit ($P = 0.002$) and at 6 weeks ($P < 0.0001$). SSC led to higher maternal satisfaction rates, better temperature gain in immediate post-partum period, lesser weight loss was at discharge and at first follow-up (all $P < 0.0001$) and lesser morbidity than the study group ($P = 0.006$). **Conclusion:** Very early SSC is an effective intervention that improves baby's suckling competence, maternal satisfaction, breastfeeding rates, atemperature control and weight patterns.

Keywords: Skin to Skin Care, Breastfeeding, Hypothermia

Introduction

Breast milk is the best gift that a mother can give to her newborn baby. In ancient India, early and exclusive breastfeeding was the custom and so was proximity between the mother and her baby. The ancient scriptures are substantial testimony of the same. The concept of rooming-in described in the Sushruta Samhita, states that the sight, sound, or touch of the baby is enough to promote lactation in the mother^[1]. Modernization has brought with it the trend of separating the baby from its mother. These blunders over years gradually resulted in an increase in neonatal mortality and morbidity.

The neonatal mortality rate is still high in India-39/1000 population as per National Family Health Survey (NFHS-3) conducted in 2005-2006. The figures on breastfeeding rates in the modern India are disappointing. According to NFHS-3, only about 23.6% of the newborns were breastfed within 30 min. of birth and only 24.5% of the newborns within 1 hour after birth.

Objectives

This randomized control study was undertaken to compare the effect of very early skin-to-skin contact (SSC) (against no intervention), on the success of breastfeeding as determined by effective breastfeeding measured by modified infant breastfeeding assessment tool (IBFAT), breastfeeding status at 6 weeks and maternal satisfaction at the time of discharge, regarding their perception about how baby is breastfeeding. Secondly, we aimed to

study the effect of very early SSC on neonatal well-being (thermal regulation in immediate post-partum period, baby's weight parameters and morbidity during first 6 weeks of life).

Materials and Methods

A total of 298 mother-baby dyads were enrolled in this randomized control trial conducted at (a tertiary care hospital) situated in Kanpur district of Uttar Pradesh, India (over a 2 year period from July September 2012 onwards). The study was approved by the Rama Medical College Hospital & Research Centre's Ethical committee. All term babies born during the study period by singleton normal delivery who did not require resuscitation beyond the initial steps post-partum were included. Babies with major congenital malformation, babies separated from their mothers postpartum and whose mothers refused consent, were excluded from the study.

By considering the baseline exclusive breastfeeding rates to be 69% and assuming that SSC would increase it by 20%, with $\alpha = 0.05$, power = 80% and allowing for exclusion and loss at follow-up to be 20%, the minimum sample size required was 108 (54 in each group). A total of 298 mother and baby dyads ($n = 298$), who delivered during the study period and met the inclusion criterion, were enrolled to participate in the randomized control trial [Chart 1]. An informed consent was taken from mothers who met the inclusion criteria. These mother newborn dyads were randomized into two groups namely study group and control group. Randomization

was carried out using the block randomization method, each block consisting of 50 subjects, i.e., 25 study subjects and 25 control subjects. A sealed envelope technique was used for randomization. After exclusion from the study and loss on follow-up, there were 122 babies in the study group and 118 babies in the control group. SSC consists of placing the naked neonate prone on mother’s chest immediately or soon after delivery. In our study, babies in the study group received very early (within 30 min of birth) “SSC” with their mothers, soon after birth, in the delivery room. Weighing the baby and declaration of the sex of the baby to the relatives were done beforehand and hence these did not interrupt the SSC. SSC consisted of placing the naked baby (except for wearing a cap and a nappy) prone between her/his mother’s bare breast and then both were covered with a bed sheet and then, a blanket. Axillary temperature was recorded using a digital thermometer in the beginning of SSC. The SSC was continued for not less than 2 h. Axillary temperature was again recorded at the end of SSC session.

Babies in the control group received the standard care, i.e., after drying and weighing, the baby was clothed, wrapped in a sheet and a blanket and placed next to her/his mother. Auxiliary temperature, using a digital thermometer was recorded before placing the baby with the mother and then again after 2 h.

Breastfeeding was encouraged and assisted by a trained nurse in the delivery room in both groups whenever pre-feeding behaviors

were seen. An assessment of suckling competence of the baby was done using the modified IBFAT, within 24 hour of birth.

Babies were again weighed at discharge from the hospital (i.e., between 24 and 36 h of birth) on the same electronic weighing machine. At the time of discharge, mothers

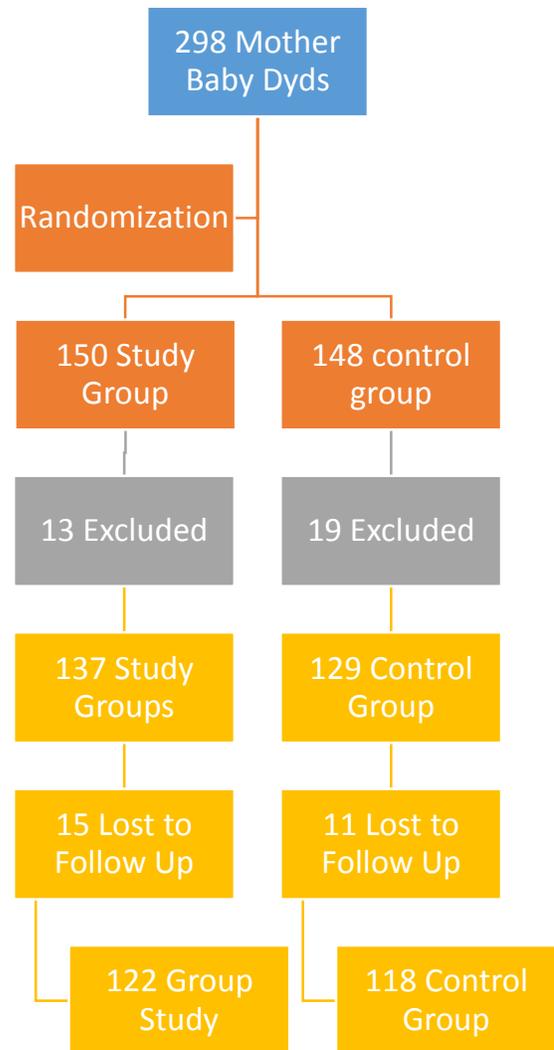


Fig-2: Participant Flow Chart

were asked to rate their satisfaction regarding their perception of how baby is breastfeeding on a four point Likert scale.

Mothers and babies were followed-up on their next visit to the hospital (i.e., on the 4th or the 5th day of birth). On this visit, baby's weight was recorded. Mothers were enquired about their baby's mode of feeding (whether exclusively breastfed, partially breastfed or not breastfed). Babies were again followed-up at 6 weeks post-birth at the time of routine vaccination. On this visit, baby's weight was recorded. An enquiry was made about any illness that the baby may have suffered during the first 6 weeks of life. Furthermore, mothers were enquired about their baby's mode of feeding (whether exclusively breastfed, partially breastfed or not breastfed) at 6 weeks. This was done either by direct interview or telephonic interview with the mother.

The data were collected on a preset performa by the observer and subjected for analysis using appropriate methods like *t*-test, Pearson Chi-square test and nonparametric Mann-Whitney test through relevant software SPSS/16.0.

Results

The baseline parameters, i.e., maternal age and parity, baby's sex and birth weight were comparable between the study and control groups [Table 1]. We observed that SSC contributed to better suckling competence since the IBFAT score in the study group were significantly better than the control group (mean 9.55 vs. 6.77; $P < 0.0001$). In our study, at the first follow-up visit (on day 4 or 5 of life), nearly 86.1% of the newborns in the study group were being exclusively breastfed whereas only 66.9% of the newborns in the control group were

receiving exclusive breastfeed ($P = 0.002$). The corresponding exclusive breastfeeding rates at 6 weeks follow-up visit were 85.2% and 63.6% for the study group and control group newborns respectively ($P < 0.0001$). Maternal satisfaction scores regarding mothers' perception about how well their baby is breastfeeding, as measured on four point Likert scale, were significantly higher in the intervention group ($P < 0.0001$) [Figure 1]. When axillary temperatures in the babies were compared at the start and end of 2 h period, the temperature gain was higher in babies in the intervention group when compared to the control group ($P < 0.0001$).

Furthermore, in the study group, all the neonates were eutermic at the end of 2 h of SSC whereas, 19 neonates (7.9%) in the control group were found to be in cold stress after 2 h period despite being clothed and being with their mothers. In our study, the infants showed significantly less weight loss in the study group ($4\% \pm 1.98\%$) than the control group infants ($6.1\% \pm 2.6\%$) at the time of discharge ($P < 0.0001$). Also, at first follow-up visit on day 4 or 5 of life, weight loss was less in the study group infants ($6.3\% \pm 2\%$) when compared with the control group ($9.2\% \pm 2.8\%$) ($P < 0.0001$). Infants in the control group suffered significantly more morbidity than the study group ($P = 0.006$) [Table 2].

Discussion

Immediately after birth, the sympathoadrenal system of the neonate is stimulated. This leads to a rapid and profound surge in the levels of

Table 1: Baseline Characteristics of Participants			
Parameter	Intervention Group	Control Group	P Value
Maternal Age (in Years)*	27.12±3.324	27.84±3.392	0.253
Parity of the mother	Primiparous=77 2nd Para=42 3rd Para=3	Primiparous=61 2nd Para=53 3rd Para=4	0.2
Baby's birth weight (in grams)*	3004.79±352.73	2994.34±401.692	0.83
Sex of the baby (M:F)	58:64	51:67	0.5
*Mean ± SD, SD - Standard deviation			

Table 2: Comparison of observed parameters between study and control group			
Parameter	Intervention group (mean ± SD)	Control group (mean ± SD)	P value
IBFAT score	9.55±1.143	6.71±1.895	<0.0001
Infants exclusively breastfed at 6 weeks*	85.2%	63.6%	<0.0001
Axillary temperature after 2 hr (in degree Celsius)	36.95±0.174	36.72±0.248	<0.0001
Weight loss at discharge (as percentage of birth weight)	4.009±1.988	6.122±2.593	<0.0001
Significant morbidity*	0.0%	5.9%	0.006
*Figures in percentage, SD - Standard deviation, IBFAT - Infant breastfeeding assessment tool			

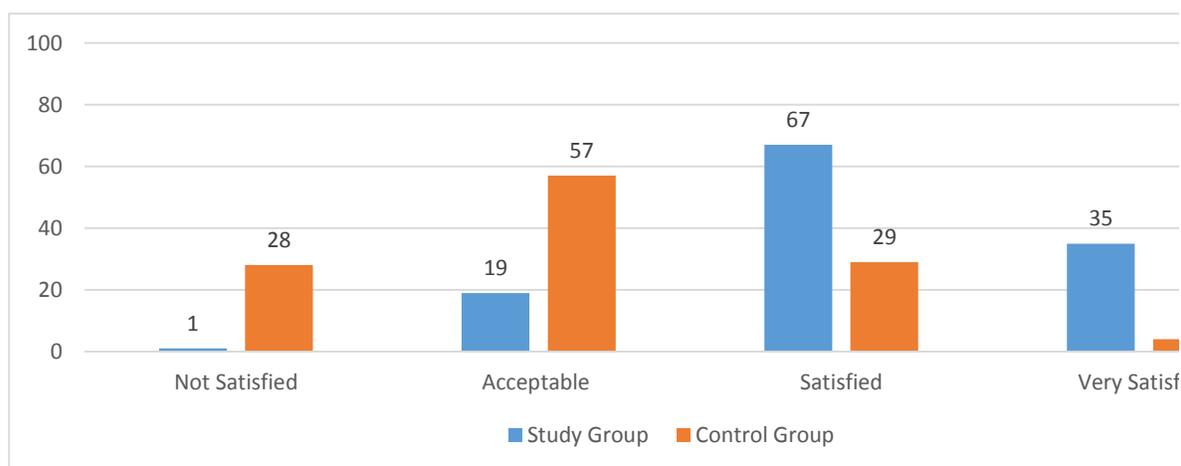


Fig-2: Maternal Satisfaction scores on Likert Scale

catecholamine and other stress hormones, a vital phenomenon for the neonate's survival. The surge in catecholamine levels is secondary to compression of the fetal head and intermittent hypoxia during uterine contractions.^[2] The newborn is quite active for a few hours after birth, to some extent, due to enormous surge in levels of catecholamines and also attributable to activation of locus ceruleus. Lagercrantz H, study on the brain of a newborn rat and demonstrated increased turnover of norepinephrine. These findings attribute to explain the alertness and arousal of a human newborn. After about 2 hours of post-birth, neonates tend to fall asleep, presumably because of a result of decrease in the circulating catecholamine levels.^[3] Later, they may be difficult to arouse for up to 3-4 hours.^[4] Hence, the first 2 hour after birth is the most optimal time to initiate breastfeeding, when neonate is alert and most sensitive to tactile, thermal and odor cues from their mothers. It has been demonstrated that high levels of circulating catecholamine affect the olfactory bulbs in a neonate to be supersensitive to odor cues from the mother's nipples.^[5] This early and unique phenomenon of olfactory recognition may be implicated in the early stages of the mother-infant attachment process, a process possibly facilitated by the high norepinephrine release and the arousal of the locus coeruleus at birth.^[6,7] Newborn infants if allowed uninterrupted contact with their mother's abdomen could find their way to mother's nipple and start effectively suckling in an average of 50 min.^[8,9]

Also, it has been cited that SSC, as a result of causing vagal stimulation through stimuli

of touch and odor, induces the release of oxytocin hormone in the mother. Besides other physiological effects, oxytocin causes the temperature of mother's breasts to rise. Thus, SSC has indirectly has a role in maintaining the infant's temperature post-partum.^[10]

Our study has supported the hypothesis that if a factor favorable for early initiation of breastfeeding, i.e., SSC was made available and breastfeeding successfully initiated and established in the first few days post-partum, it is likely to continue on for the next few months. More babies in the study group were exclusively breastfed at first follow-up visit on day 4 or 5 of life when compared with the control group babies ($P = 0.002$). The corresponding results at 6 weeks follow-up showed that significantly more infants in the study group were exclusively breastfed than the control group infants ($P < 0.0001$). These results are similar to those seen in studies by Sosa *et al.*, de Château *et al.*, Strachan *et al.*, Villalon *et al.*, Thomson *et al.*, Gomez *et al.*, Mikiellet *et al.*, and Moore *et al.*, Bramson *et al.*^[11-19] in their study also demonstrated that there is a positive dose response relationship between early SSC and breastfeeding exclusivity.

In another randomized trial in England in 2005, Carfoot S *et al.* showed that more babies belonging to SSC group were breastfed at 4 months of age when compared with the control group (43% vs. 40%), but the difference was not statistically significant.^[20] The reason could be that the mothers in England are more inclined to stop breastfeeding early because of the pressure to return to their jobs and hence, in

the UK, the estimated breastfeeding rates are 28% at 4 months.^[21]

Moore and Anderson GC evaluated the effect of very early SSC on breastfeeding status and did not prove any significant advantage on breastfeeding exclusivity at 1 month post-partum^[18] However, this study was done on 20 mother infant dyads and the sample size is much small compared to our trial. Thukral *et al.* in their trial in 2010 have substantiated the fact that early SSC significantly improved the exclusive breastfeeding rates at 48 hours and 6 weeks post-partum.^[22] In their study, the exclusive breastfeeding rates were 95% in early contact group versus 38.1% in the control group at 48 hours and 90% versus 28.6% respectively at 6 weeks follow-up.

We found that there is a significant difference in IBFAT scores between study and control group infants, signifying better latching and suckling in new borns who received SSC. It was similarly noticed by Bramson *et al.*¹⁹ using the IBFAT scores ($P < 0.02$). Also, in the study by Carfoot *et al.*,^[20] more women who gave SSC tended to have a successful first breastfeed than the control group mothers (measured by using modified IBFAT score) and this difference showed a trend toward significance ($P = 0.1$).

All mothers included in this study were willing to breastfeed their babies at the outset and all mothers irrespective of whether belonging to study group or control group were fairly motivated to breastfeed their newborn. Thukral used modified IBFAT in their study ($n = 41$) and found that

there was no significant difference in the BAT scores between the two groups ($P = 0.6$).

Conclusion

We, therefore, conclude that very early SSC has a significant effect on baby's suckling competence, on temperature regulation in the post-partum period and is more likely to result in continuation of exclusive breastfeeding in the infants well into the early months of life. The physiological weight loss in the first few days of life is less likely to exceed the normal range which means less chances of significant morbidity (such as dehydration fever, neonatal hypernatremic dehydration and hypoglycemia) newborns receiving SSC. We did not find any adverse events in babies who received the intervention of SSC. Mother and baby should not be separated after birth, rather kept in close SSC with each other so that there is no hindrance to the silent conversation ongoing between the two of them.

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