



IMPACT OF EARLY SKIN TO SKIN CONTACT OF MOTHER AND NEWBORN AFTER BIRTH ON PLACENTAL SEPARATION AND EARLY INITIATION OF BREASTFEEDING: A RANDOMIZED CONTROL TRIAL

Paediatric Medicine

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ABSTRACT

Background: Third stage of labor begins just after the delivery of the fetus and ends with expulsion of placenta and its membranes. One of the most common complication along with this stage is postpartum hemorrhage which is a major cause of maternal morbidity and mortality. By early skin to skin contact of mother and newborn soon after birth and early initiation of breastfeeding leads to the secretion of maternal oxytocin effectively, which accelerate third stage of labor and prevent post-partum hemorrhage and also promote emotional bonding between mother and newborn **Aim:-** To evaluate the effect of early skin to skin contact between the mother and newborn on the duration of placental separation and early initiation of breastfeeding. **Method:** It was a randomized control trial and a hospital-based study in delivery room at rural tertiary care unit. **Result:** This study demonstrated a statistically significant effect on early skin to skin contact of mother and newborn on the duration of placental separation as the mean duration was (80.01+/-32.78) seconds in case group and (121.94+/-59.93) seconds in control group and its p value was <0.01 and also showed the early initiation of breastfeeding as the mean time of first breastfeeding was (1.25+/-0.45) hours in case group and (2.35+/-0.7) hours in control group as the difference was statistically significant with p value <0.01. **Conclusion:** This study advocates early skin to skin contact of mother and newborn for betterment of maternal and newborn outcome by decreasing the duration of placental delivery and early initiation of breastfeeding. **List Of Abbreviation:** Skin to skin contact = SSC.

KEYWORDS

INTRODUCTION:-

In many parts of the world postpartum hemorrhage and early neonatal death from inadequate feeding are significant problems ⁽¹⁾. Breastfeeding and early initiation of Skin-to-Skin Contact (SSC) in the first hour after birth can lead to 22% reduction in mortality of infants in the first 28 days of life. Initiation of successful breast-feeding through SSC is a basic step recommended in the "Ten Steps to Successful Breastfeeding"⁽²⁾.

Skin-to-skin contact is defined as the holding of the newborn baby undressed in a prone position against the mother's bare chest between breasts while the back of the baby covered with a blanket⁽³⁾. Skin to skin contact through sensory stimuli such as touch, warmth and odor is a powerful vagal stimulant which among other effect release maternal oxytocin ⁽⁴⁾. The two main target organs for oxytocin's physiologic effects are the lactating breast and the uterus⁽⁵⁾. SSC increases oxytocin level in the maternal blood. The importance of this hormone for its role in uterine contractions and ejection of breast milk during infant suckling is well known in addition to the emotional process that takes place between the mother and the infant during childbirth⁽⁶⁾.

In addition, when the baby is placed in skin contact with mother, the movement of the baby's feet on the mother's abdomen acts like uterine massage which can stimulates the uterine contractions and exit of placenta^(7,8). Placental separation typically occurs within a few minutes after delivery. This process typically takes 5 to 20 minutes i.e. (300 to 1200 seconds) after delivery of the baby and occurs spontaneously⁽⁹⁾. Skin-to-skin contact should be started during the first minute after birth and throughout the third stage of labor, to produce elevated levels of oxytocin aiding in separation and expulsion of placenta^(10,11). Oxytocin also has anti-anxiety effects and can increase the feeling of comfort and confidence^(12,13). Although there are western researches available on the benefits of mother-infant SSC (1-13) but in this context very limited data published in our country (14) that's why depicting less implementation in practice so this study is planned to know about effect and implication of early skin to skin contact for both mother and newborn

Methodology:-

Study Design And Settings: it was a randomized control trial and a hospital-based study in a rural tertiary care unit.

Study Population: study subjects were selected on the basis of:-

Inclusion Criteria:-

- Normal near-term pregnancy (34 to 42 weeks of gestation)
- Single viable live fetus in cephalic presentation
- Did not receive any pharmacological pain relief substance
- Gave consent for her participation in study

Exclusion Criteria:-

- Pregnant women with any risk factor like Pregnancy Induced Hypertension, Gestational Diabetes Mellitus, Preeclampsia
- Delivery by cesarean- section
- Newborn required resuscitation or intensive care at birth
- Premature newborn (<34week of gestation)
- Mother with preexisting co morbidities

Study Conduct:

Participants were informed about study and a written consent was taken. A randomized controlled trial conducted in labor room at a rural tertiary care hospital. In our study each of the eligible participant had equal chance to be allocated. We made two groups of case and control of 4 participants each day. We wrote their name on envelopes in each group and randomly selected one envelope in each group. An interview questionnaire sheet was used to collect the socio- demographic and obstetrical data from the participant women in both groups during the first stage of labor. First stage of labor is from initiation of true labor pain to full dilation of cervix which was recorded on basis of recall method from patient. Second stage was up to fetal delivery which was recorded using stopwatch. A 'stop watch' was used to calculate the duration of the third stage of labor in both groups starting from the complete expulsion of the fetus till the complete placental delivery (separation and expulsion of the placenta), the assessment items such as APGAR score for newborn, LATCH scale⁽¹⁵⁾ was used to assess breastfeeding. A comparison between both groups was done to identify the effect of mother and newborn early SSC on duration of placental delivery and early initiation of breastfeeding.

Intervention:

Early Skin-to-skin contact of mother and newborn in which holding of the newborn baby undressed in a prone position against the mother's bare chest between breasts immediately after birth, before placental delivery, and the baby was suctioned if required while on the mother's chest, well dried and covered with a pre-warmed blanket over both mother and baby, the baby's head was covered with a dry cap that was replaced when it became damp to prevent heat loss. Ideally, all other

interventions were delayed until the end of the first hour post-birth.

Sample Size Calculation:

Calculated sample size in each group was 91 which was based upon findings from a previous study conducted at Damnhour University, Damnhour, Egypt⁽¹⁾ by taking proportion in standard treatment is 60%, proportion in new treatment is 90%, superiority margin was 0.15%, power was 80%, and alpha error was 5% so total sample size was 182.

Data Collection And Statistical Analysis Plan: -

The collected data were entered in excel spreadsheet. The results were described in terms of mean and standard deviation for continuous variables and presented in form of frequency and proportion for categorical variables. Chi square test had applied for determining any association between non utilization and factors associated with it using SPSS (20.0 ver) software. A P <0.05 was considered as statistically significant. Ethical approval had been taken from institutional ethics committee before starting the study.

RESULTS: -

Majority of study participants were from 18 to 24 age in which (48.4%) constituted case and (51.6%) were in control, and (53%) in case and (47%) in control were from 25-30 age group and among >30 years (48%) in case and (52%) in control and mean value was (25.36), (25.53) years in case and control respectively and standard deviation was (4.12), (5.14) in case and control respectively and its p value was 0.8 which was not significant.

Out of total in illiterate, illiteracy was found (46.6%) in case and (53.4%) in control, (38.8%) had received primary education in case and (61.2%) in control, (65.5%) and its p value was 0.217 which was statistically not significant.

As shown in table 1 most of participants were in lower middle socioeconomic status and incidentally it was statistically significant as p value 0.023 (<0.05) because this study done at rural area.

From all participants who had ≤ 3 antenatal visits, approximately (50%) from case and control group respectively, and who had > 3 visits, (46.6%) were in case group and (53.4%) in control group and its p value was 0.02 which was statistically significant as <0.05. (Table 1)

Table1:- Distribution Of Study Participants According To Sociodemographic Profile (n=182):-

	Case (n=91)	Control (n=91)	Total	P value
Education				
Illiterate	7 (46.6%)	8 (53.4%)	15 (100%)	0.217
Primary	12 (38.8%)	19 (61.2%)	31(100%)	
Secondary	53 (49.5%)	54 (50.5%)	107(100%)	
Graduation	19 (65.5%)	10 (34.5%)	29(100%)	
Residence				
Rural	78 (47.8%)	85 (52.2%)	163(100%)	0.09
Urban	13 (68.4%)	6 (31.6%)	19(100%)	
Socioeconomic status				
Lower middle	62 (46.9%)	70 (53.1%)	132(100%)	0.023
Upper lower	8 (38%)	13 (62%)	21(100%)	
Upper middle	21 (72.4%)	8 (27.6%)	29(100%)	
Number of antenatal visits				
≤3	50 (53.2%)	44 (46.8%)	94 (100%)	0.02
>3	41 (46.6%)	47 (53.4%)	88 (100%)	

Gestational age of study participants was 34-36 weeks among them (50%) were case and (50%) were control, 37-40 weeks was (50.6%) by case and (49.4%) by control, >40 weeks was (33.3%) by case and (66.6%) by control and its p value was 0.9 which was not significant. (Table 2)

Table-2= Gestational Age Of Newborns

Gestational age	Case (n=91)	Control (n=91)	Total	P value
34-36 weeks	11 (50%)	11 (50%)	22 (100%)	0.9
37-40 weeks	78 (50.6%)	76 (49.4%)	154 (100%)	
>40 weeks	2 (33.3%)	4 (66.6%)	6 (100%)	
Mean	38.34	38.30		
Std deviation	1.72	1.88		

Duration of first stage of labor was <14 hours, among which (52.94%) by case and (47.06%) by control, > 14 hours was (8.3%) by case and (88.4%) by control, and mean value of case was (10.36±2.15) hours and of control was (12.42±2.07) hours and its p value was 0.174 which was not significant.

Duration of second stage of labor was <15 minutes (62.3%), (37.7%) by case and control group respectively, >15 minutes was (11.3%) by case and (88.4%) by control and mean value of case group was (11.27±3.88) minutes and of control group was (16.8±4.5) minutes and its p value was 0.134 which was not significant.

As we did intervention of early skin to skin contact in labor room just after delivery of mother and newborn in case group, duration of third stage of labor **less than 60 seconds was (80.5%) by case and (19.5%) by control which had p value (<0.01), which was statistically significant**, 61 to 120 seconds was (51.4%) by case and (48.5%) by control, 121- 180 seconds was (27.5%) by case and (72.4%) by control, 181-240 seconds was (22.2%) by case and (77.7%) by control, >241 seconds was (100%) by control and mean duration of case was (80.01±32.78) seconds and of control was (121.94±59.9) seconds, and it proved that early skin to skin contact decreases the duration of placental separation. (Table 3)

Table 3: - Distribution of study participants according to duration of third stage of labor (n=182):

Duration (in seconds)	Case (n=91)	Control (n=91)	Total	P value
<60	29 (80.5%)	7 (19.5%)	36 (100%)	<0.01
61-120	52 (51.4%)	49 (48.5%)	101 (100%)	
121-180	8 (27.5%)	21 (72.4%)	29 (100%)	
181-240	2 (22.2%)	7 (77.7%)	9 (100%)	
>241	0 (0%)	7(100%)	7(100%)	
Mean value	80.01	121.94		
Std deviation	32.74	59.93		

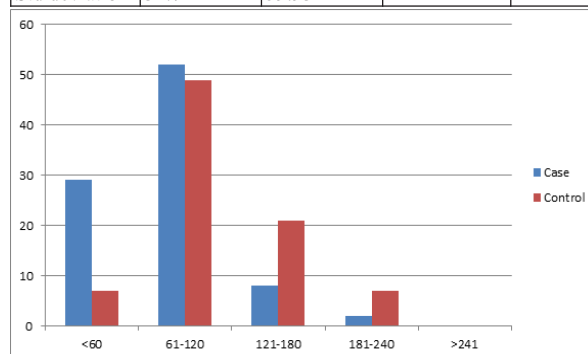


Figure 2: - Representation of study participants according to duration of third stage (in seconds): -

Initiation of first breastfeeding **within 30 minutes was (7.7%) by case and in control group no newborn started breastfeeding within 30 minutes and had p value (<0.01) which was statistically significant**, and 0.5-1 hours was (51.6%) by case and (3.2%) by control, 1-1.5 hours was (25.3%) by case and (15.38%) by control, 1.5-2 hours was (14.3%) by case and (36.3%) by control, 2-2.5 hours was (1.1%) by case and (8.7%) by control, >2.5 hours was (36.3%) by control and mean duration of case group was (1.2±0.45) hours and of control was (2.35±0.7) hours, and it proved that early skin to skin contact causes early initiation of breastfeeding. (Table 4)

Table 4: - Distribution of study participants according to time of start of first breastfeeding (n=182): -

Duration (in hours)	Case (n=91)	Control (n=91)	P value
<0.5	7 (7.7%)	0 (0%)	<0.01
0.5-1	47 (51.6%)	3 (3.2%)	
1-1.5	23 (25.3%)	14 (15.38%)	
1.5-2	13 (14.3%)	33 (36.3%)	
2-2.5	1 (1.1%)	8 (8.7%)	
>2.5	0	33 (36.3%)	
Total	91 (100%)	91(100%)	
Mean value	1.25	2.35	
Std deviation	0.45	0.70	

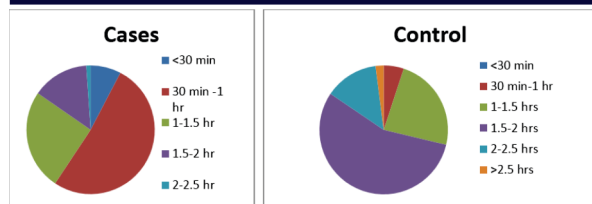


Figure 3: - Representation of study participants according to time of first breastfeeding (in hours): -

Majority of newborn weight was <4 kg in both case and control group, >4 kg was only by one newborn in control and its p value was 0.7 which was not significant.

LATCH score of study participants was 7 (50%) by case and (50%) by control, was 8 (47.8%) by case and (52.1%) by control, was 9 (54.5%) by case and (45.4%) by control and its p value was 0.29 which was not significant. (Table 5)

Table 5: - Distribution of study participants according to weight of newborn and LATCH score: - (n=182)

	Case (n=91)	Control (91)	Total	P value
Weight of newborn				
<4 kg	91 (50.2%)	90 (49.8%)	181 (100%)	
>4 kg	0 (0%)	1 (100%)	1 (100%)	
LATCH score				
7	6 (50%)	6 (50%)	12 (100%)	0.29
8	55 (47.8%)	60 (52.1%)	115 (100%)	
9	30 (54.5%)	25 (45.4%)	55 (100%)	
Mean value	8.2	8.2		
Std deviation	0.58	0.58		

DISCUSSION:-

Maternal mortality is still there due to postpartum hemorrhage and multiple intervention are in trials to prevent this in which early skin to skin contact of mother and newborn is emerging as a good method as it decreases the duration of placental separation thus decreases chances of post-partum hemorrhage so that maternal life can save and also helpful for newborn as it gives the mother immediate access to their newborn, and helps them to initiate early breastfeeding. The present study reveals that the mean maternal age was 25.36 ± 4.127 years for case group compared to 25.53 ± 5.145 years for control group which is significantly not satisfied and equivalent result were found in study of Rasha M et al⁽¹⁾ because this is the most common reproductive age for women. Women in case group were more graduated as compared to control group and similar results were presented in study of M K Mejbel et al⁽¹⁷⁾ because educated women can understand the concept of skin to skin contact and had knowledge about importance of breastfeeding and they gave consent.

Majority of study participants belongs to lower middle socioeconomic status in both case and control group which was statistically significant because this study done at rural area and this result also came in study of M K Mejbel et al⁽¹⁷⁾. Maximum study participants had ≤ 3 antenatal visits approximately equally in both case and control group and analogous results present in study of K Safari et al⁽¹⁶⁾ these results were due to fact that majority of participants were belongs to lower socioeconomic status and had lower knowledge about its importance and still people have less antenatal visit in rural area.

Majority of participants had duration of first stage of labor <14 hours from both case and control group and >14 hours were majority from control group, majority of participants had duration of second stage of labor <15 minutes were (62.3%) from case group and (37.7%) from control group, >15 minutes were majority from control group and this was not statistically significant and this time period corresponds to the normal duration of labor.

Early skin to skin contact of mother and newborn intervention done in case group and duration of third stage of labor was **<60 seconds were $4/5^{\text{th}}$ from case group and $1/5^{\text{th}}$ from control group** which was statistically significant and its p value was (<0.01) followed by had 61 to 120 seconds were approx. half from case group and half from control group and had >180 seconds were (12.5%) from case group and (87.5%) from control group and its mean value of case group was

(80.01 ± 32.78) seconds and of control group (121.94 ± 59.93) seconds that is defined by the fact that oxytocin was released which accelerated the uterine contraction resulting in early separation of placenta and identical results were seen in study of H Y Al-Morbaty et al⁽¹⁸⁾ in 2017 at Saudi Arabia, Rasha M Essa et al⁽¹⁾ in 2015 at Egypt, K Safari et al⁽¹⁶⁾ but on the contrast study done by Khadivzadeh et al⁽⁷⁾ 2018 at Iran stated that there was no significant difference in the mean duration of third stage of labor between two groups.

Majority of newborn had weight <4 kg and term gestation in both case and control group and only one newborn in control have >4 kg which was significantly not satisfied and similar results were seen in study of M K Mejbel et al⁽¹⁷⁾.

Due to intervention in case group duration of first breastfeeding **<30 minutes in (7.7%) case group and no one in control group** which was statistically significant and its p value was (<0.01), 0.5 to 1 hour in (51.6%) case group and (3.2%) control group, >2 hours were majority by control group and mean value of case group (1.25 ± 0.45) hours and of control group (2.35 ± 0.70) hours, early skin to skin contact resulting in oxytocin release and accessibility and capability of newborn made first breastfeeding earlier and easier. Identical results were seen in study done by K Safari et al⁽¹⁶⁾ and Rasha M Essa et al⁽¹⁾. Majority of participants had latch score 8 both from case group and control group and corresponding results also seen in K Safari et al⁽¹⁶⁾ as proved that latch score is not limiting factor for early initiation of breastfeeding.

CONCLUSION:-

According to the results obtained by the above study of early skin to skin contact of mother and newborn we came to the conclusion that this noninvasive, non-pharmacological, free of cost intervention aids in the reduction of the duration of the placenta delivery and postpartum hemorrhage and thus helps in reduction of maternal morbidity and mortality in the developing countries. It helps in early initiation of breastfeeding and also acts as a significant tool in building up of emotional bonding between mother and newborn which is good for both mother and newborn and prevent newborn from hypoglycemia, hypothermia and their complications.

Recommendations:-

There are very few studies regarding this intervention in Indian setup so there is need of more studies worldwide and in India also. Hereby, we can strongly recommend the implementation of early skin to skin contact in our routine practice in all maternity hospitals (district hospital and rural primary health centers) and it should be an available choice for all delivering women. And if all researches indicate favorable outcome, it can be included in national policy.

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