



ROLE OF EMBRACE IN NEONATAL TRANSPORT FROM LABOUR ROOM TO NICU: A RANDOMIZED CONTROLLED TRIAL

Paediatrics

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ABSTRACT

Background : Hypothermia in newborn is an important cause for morbidity and mortality. The first ever transport from labour room (LR) to NICU is one that is often overlooked. Fact remains that many babies are found to be hypothermic upon arrival in NICU. Embrace is a wrap carrier used to keep neonates warm during transport from place to place within the hospitals and uses a phase changing mattress to maintain thermal stability. Our objective is to compare incidence of hypothermia in preterm babies transported in embrace versus those transported in cling wrap. **Methods :** 60 babies are selected in each limb after random allocation. Babies less than 37 weeks are selected. Rectal temperature is checked before shifting from labour room and after reaching NICU. **Results :** The result of my study in showed that in the embrace group, there is improvement in maintenance of temperature with 16% reaching NICU in eutermic state. Upon arrival in NICU Embrace group had lower incidence of hypothermia as compared to the Cling wrap. the core temperature was noted to be higher in the Preterm Embrace group although still in the hypothermic range. It was noticed that there was shift from moderate hypothermia to mild hypothermia in preterm Embrace group. **Conclusion:** Use of embrace achieved eutermia in 16% babies versus none in the cling wrap group. Mean core temperature showed a reduction in cling wrap group whereas it showed an increase in embrace group.

KEYWORDS

INTRODUCTION :-

Despite hypothermia being an important factor for morbidity and mortality, studies for preventing hypothermia while during transported from labour to NICU are very few especially by using Embrace in our region. Normal core temperature in neonates is between 36.5-37.5. Preterm neonates are more predisposed to hypothermia, especially during transport.

The first ever transport from labour room (LR) to NICU is one that is often overlooked. Especially in places where LR and NICU are not adjoining. Fact remains that many babies are found to be hypothermic upon arrival in NICU. Worse outcomes are seen with hypothermia like apnea, poor feeding, hypoglycemia, hypoxia, metabolic acidosis, prolonged coagulation abnormalities and even death. Infant should be kept in thermal neutral environment so that their energy is utilized for growth and other vital functions. Traditionally, preterm babies in cling film during transport from LR to NICU.

Embrace is a wrap carrier used to keep neonates warm during transport from place to place within the hospitals and uses a phase changing mattress to maintain thermal stability. We propose to investigate the role of Embrace in the transport of babies from LR to NICU.

Aim And Objectives :-

Aim :-

To compare the efficacy of Embrace against cling wrap in preterm babies during transport from labour room to NICU.

Objectives :-

Primary Objectives:

Compare incidence of hypothermia in preterm babies transported in embrace versus those transported in cling wrap.

Secondary Objective:

To compare the core temperatures of Preterm babies upon arrival in NICU transported with Embrace wrap and cling wrap

METHODS:-

- **Sample Size:** 120

Preterm Babies – 60 in each limb.

Allocation to study groups is as per random numbers generated with computer aided random table.

- **Study Population:**
- **Inclusion Criteria:-**

Preterm babies below 37 weeks of gestational age

- **Exclusion Criteria:-**

Congenital anomalies

Lethal chromosomal abnormalities

Congenital skin disorder

- **Study Procedure:**

Rectal temperature is checked before shifting from labour room and after reaching NICU.

Temperature will be checked at planned time intervals: 0hr, 30 min, 1hr, 3hr, 6hr, 12hr, 24hr .

Statistical Analysis:-

- Data analysis was performed by SPSS (version 17) for windows. Alpha value was set as 0.05.
- Descriptive statistics was performed to find out mean, standard deviation for the demographic variables.
- Unpaired t test was used to find out significant differences among demographic variable such as gestational age, weight, APGAR, pulse, RR, SPO2, GRBS and temperature. Chi square test was used to find out gender among both groups.
- Unpaired t test was used to compare between group for temperature and duration of shifting.
- Microsoft excels and words were used to generate tables and graph.

Ethical Issues :-

- All babies will be managed as per institution protocol
- There is no additional investigation, cost or discomfort

RESULTS:-

Table No :-1- Incidence Of Hypothermia In Preterm Cling Wrap Group

SL.No:	TEMPERATURE	BEFORE SHIFTING		AT ARRIVAL	
		Frequency	%	Frequency	%
1	Normal	00	00	00	00
2	Mild	17	28.33	20	33.33
3	Moderate	43	71.67	40	66.67
4	Severe	00	00	00	00

- Normal temperature was not achieved by using Cling wrap for transport at arrival.
- Incidence of mild hypothermia in cling wrap group increase from 28.33 to 33.33%.
- Incidence of moderate hypothermia decreased from 71.67 % to 66.67%.
- No babies were in severe hypothermia.

Table No: 3- Incidence Of Hypothermia Comparison Between

Preterm Embrace And Cling Wrap Group

	Embrace	Cling wrap
Euthermia	16.6%	0
Moderate hypothermia	45%	66.67%
Mild hypothermia	38%	33.3%

P Value: not significant

Even though statistically insignificant, incidence of hypothermia was lower in babies in embrace group

Table No: 2 - Incidence Of Hypothermia In Preterm Embrace Group

Sl.No:	TEMPERATURE	BEFORE SHIFTING Frequency	%	AT ARRIVAL Frequency	%
1	Normal	02	3.33	10	16.67
2	Mild	29	48.33	23	38.33
3	Moderate	29	48.33	27	45
4	Severe	00	00	00	00

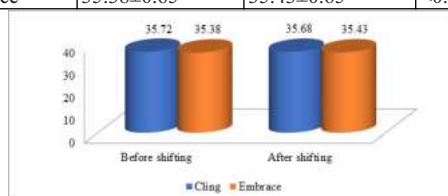
Normal temperature incidence increased from 3.33 % to 16.67 % on using embrace for transport at arrival.

Incidence of mild hypothermia in embrace group decreased from 48.33 to 38.33%.

Incidence of moderate hypothermia decreased from 48.33 to 45%. No babies were in severe hypothermia

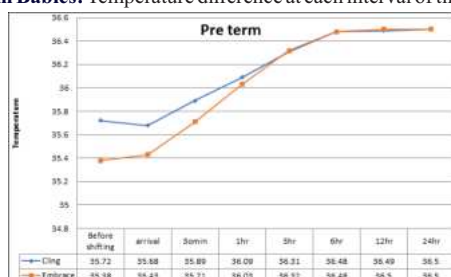
Table no:4 - Preterm : Comparison Of Core Temperature Before And After Shifting

Variable	Before shifting	After shifting	p-value
Cling	35.72±0.57	35.68±0.56	>0.20
Embrace	35.38±0.65	35.43±0.65	<0.002



- In the cling wrap group, the mean core temperature before shifting is 35.72 and sd is 0.57 and the median core temperature after shifting is 35.68 and sd is 0.56 which was not statistically significant (p value >0.20)
- In the embrace group, the mean core temperature before shifting is 35.38 and sd is 0.65 and the median core temperature after shifting is 35.43 and sd is 0.65 which was statistically significant (p value <0.002).

Preterm Babies: Temperature difference at each interval of time



- It is evident in this graph that babies in embrace group was at lower temperature before shifting we can also note that there is slight decline in temperature of babies in cling wrap. Babies using embrace are having a steady gain in temperature.
- In both group normal temperature is attained between 3hr and 6hr.

DISCUSSION :

- The present study was carried out as a randomized control trial over one year from July 2020 to July 2021 in NICU, Aster MIMS Calicut. Primarily the study assess the incidence of hypothermia in preterm babies transported from NICU using Cling and Embrace.
- Maintaining temperature of newborns is of great importance as hypothermia may result in both morbidity and mortality. The risk of hypothermia is very real during transport from labour room to

NICU; this has not been subjected to study.

- Embrace consists of a phase changing material that help to maintain temperature. Is embrace superior to cling film in preterm babies in maintaining temperature during intra-hospital transport? To date, most of the studies were done using cling wrap.
- In our study a total of 120 babies were studied. Of this 60 preterms were transported using Cling wrap and 60 preterms using embrace. In both these study groups, babies were allotted as per random numbers generated with computer aided random table.
- The result of my study in showed that in the embrace group, there is improvement in maintenance of temperature with 16% reaching NICU in euthermic state. Upon arrival in NICU Embrace group had lower incidence of hypothermia as compared to the Cling wrap.
- Furthermore, the core temperature was noted to be higher in the Preterm Embrace group although still in the hypothermic range. It was noticed that there was shift from moderate hypothermia to mild hypothermia in preterm Embrace group. It is also noteworthy that the gestational age and birth weight were lower in the Embrace group. Both Embrace and cling wrap group attained normal temperature within 3–6hr under radiant warmer.
- Despite an exhaustive perusal of accessible medical literature, we could not find any study on comparing embrace with cling wrap during transport from labour to NICU. All available studies are on comparing cling wrap with cloth wrap and also from ED to NICU and in inter hospital transport.
- In a study by Morgaonkar to assess the efficacy Embrace nest warmer versus cloth wrap in preventing hypothermia during transport from ED to NICU a total of 120 babies weighing more than 1500g (60 per each group) were enrolled. The mean SD temperature increase in embrace group was 0.37°C and 0.38°C fall in temperature was noted in cloth wrap group. In this study it is clearly mention that using Embrace showed significantly improved thermoregulation in neonates when compared with Cloth wrap group. Distance between labour room to NICU may vary in different centres and therefore the utility also may vary accordingly.[1]
- Niembalkar[6] et al did a survey on usage of embrace in Gujarat. Paediatricians who participated in this survey used Embrace in mainly low birth weight babies, for inter and intra hospital transport and also for keeping the babies warm at bedside. Most of them felt that babies were comfortable when placed in embrace. 33.3% reported issues related to heating and temperature regulation, 30% of the Paediatricians had issues related to cleaning, disinfection, charging, monitoring, as well as issues with the size (too large for ELBW infants). Up to 19% paediatricians found reported on combination of the above-mentioned issues. No such issues were noted during our study. Provision of an additional inner cushion by the company sorted out the issue of size disparity in ELBW neonates.
- In a study from Providence, USA, babies weighing 1036g and mean gestational age 28 week were transported from labour room to NICU and 49.6% babies were in hypothermia range (<36°C) In our study in clingwrap group around 66% babies reached in <36°C temp and in Embrace group 38.33% only reach in <36°C.[4]
- While mean core temperature was not recorded in our parent study, our study noted an improvement in mean core temperature in the Embrace group.
- In conclusion my study favours Embrace in usage of transport of babies from labour to NICU with Cling wrap in preterm.

CONCLUSION :-

- The result of my study among 120 preterm babies concludes that
- 1. Use of embrace achieved euthermia in 16% babies versus none in the cling wrap group.
- 2. Embrace group had lower incidence of moderate hypothermia (45%) in comparison with cling wrap group (66%).
- 3. Embrace group had higher incidence of mild hypothermia (38%) in comparison with cling wrap group (33%).
- This is because in the Embrace group babies who started off a moderate hypothermia moved over to mild hypothermia category.
- Mean core temperature showed a reduction in cling wrap group whereas it showed an increase in embrace group.

Limitation :-

- Element of bias in preterm study population as shown in the comparison of baseline characters.
- Further studies may be done with larger study sample

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