

Comparison of Frequency of Hypothermia in Preterm and Low Birth Weight Infant Managed with Plastic Bag Versus Conventional Method

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¹Conceived Idea, Manuscript Writing, Final Reading and Approval, Data Interpretation.

²Data Collection and Literature Review.

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Article Info

Received: Nov 24, 2017

Accepted: Mar 15, 2018

Funding Source: Nil

Conflict of Interest: Nil

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ABSTRACT

Objective: To compare the frequency of hypothermia in preterm and low birth weight infant managed with plastic bag VS conventional method

Study Design: Randomized Control Trial with Consecutive Non probability sampling.

Place and Duration of Study: Neonatal unit of Sheikh Zayed Hospital. From October 2014 to November 2016

Methodology: A total of 200 (100 in each group) preterm Neonates gestational age <37 completed weeks, having birth weight <2.5kg of male and female babies were included, informed consent from parents/attendants were taken. Quantitative variables like gestational age, birth weight and temperature was presented by mean and standard deviation, qualitative variables like gender and presence of hypothermia was presented by frequency and percentage in both groups.

Results: In our study, mean gestational age of the mothers was recorded as 33.54+1.76 weeks in Group-A and 33.46+1.82 weeks in Group-B. 54%(n=54) in Group-A and 47%(n=47) were male while 46%(n=46) in Group-A and 53%(n=53) in Group-B were females, in a Group B by conventional method hypothermia was recorded as 69% (n=69) Group-A 45%(n=45). While remaining 31%(n=31) in Group-A and 55%(n=55) in Group-B had no findings of the morbidity, p value was calculated as 0.000 showing a significant result in favor of plastic bag method.

Conclusion: We concluded that by using plastic bags we reduced the frequency of hypothermia in preterm and low birth weight infant managed with plastic bag is significantly reduced when compared with conventional method. However, our data is primary in our population and needs some other studies for its validation.

Keywords: Hypothermia, plastic bag, conventional method

Introduction

Hypothermia is significant problem in neonates. Mortality rate twice in hypothermic babies.¹ Hypothermia cause 39% of morbidities in preterm neonates.²

Due to large surface area, less subcutaneous fat thin skin and increase water loss Premature and low birth weight infants are more vulnerable to hypothermia.^{3,4}

Ibrahim CP and CW Yoxall studied by using plastic bag hypothermia reduced from 25% to 16%.⁵ E Leadford et al studied using plastic bag for hypothermia in preterm low birth weight infant and found that by using plastic bags 40.8% preterm lowered their temperature from normal range as

compare to 67.3% preterm who become hypothermic with conventional methods (blanket or radiant warmer).¹ very limited data is available regarding the privation of hypothermia.⁶ There is an increase burden of prematurity and low birth rate and increase risk of hypothermia there is a need of very simple, easy technology low cost intervention that can be readily available in our country.⁷ So the rational of our study is aimed at evaluating effectiveness of plastic bags in preventing hypothermia in preterm neonates. If plastic bag technique proved effective so this low cost technique must be considered to be implemented in our country.

Methodology

Consecutive non probability sampling technique was used for the purpose of patient's data collection.

An approval was taken by ethical committee of hospital. Cases were registered for study and demographic information of the patients (name, age, sex) were obtained and entered into proforma. After receiving in nursery the neonates were dried and randomly assigned by using random number table in two groups, group A include babies who after drying were provided with conventional method to prevent hypothermia, and group B included babies who after drying were put in plastic bags to prevent hypothermia, first temperature was noted from axilla just after drying the neonates, then axillary temperature was noted in both groups first after 10 minutes and then after 1 hour.

Estimated sample size is 200 (100 in each group) cases using 5% level of significance, 80% power of test with an expected percentage of efficacy in plastic bag group as 40.8% and in conventional method group (radiant warmer group) as 67.3%.¹

The study only on preterm neonates having weight of less than 2.5kg. only booked cases were included and no emergency was included.

Inclusion Criteria Preterm Neonates gestational age <37 completed weeks assessed on Last Menstrual period date. Neonates having birth weight <2.5kg. Both male and female babies are included

Exclusion Criteria: Newborns having

- Birth asphyxia (APGAR Score <7 on 5 minutes)
- Meconium aspiration syndrome (with stained vocal cords)
- Lethal congenital anomalies e.g. anencephaly, myelomeningocele
- Blistering skin disorder e.g. epidermolysis bullosa on clinical examination.

Data Collection Procedure: 200 preterm and low birth weight neonates, 100 in each group, born in Gynecology Unit, Sheikh Zayed Hospital Lahore meeting the inclusion criteria were selected, informed consent from parents/attendants were taken. Hypothermia was labelled as per operational definition.

Informed consent was taken by the parents regarding study protocol. All the neonates had been provided the standard of care treatment of available setting in addition to that of the treatment was given to Group A and B. All participating neonates were closely adverse effects and in case of failure of treatment shifted to standard protocol.

Data Analysis Plan: Data was entered and analyzed by using SPSS 17.0 software. Quantitative variables like gestational age, birth weight and temperature was presented by mean and standard deviation, qualitative variables like gender and presence of hypothermia was presented by frequency and percentage in both groups. Chi Square was applied with p value <0.05 was considered as significant. Data was stratified for gestational age and birth weight. Chi-square was used post stratification. P value <0.05 was considered significant.

Results

A total of 200 cases (100 in each group) fulfilling the inclusion/exclusion criteria were enrolled and both groups were compared for frequency of hypothermia. Mean gestational age of the mothers was recorded as 33.54 ± 1.76 weeks in Group-A and 33.46 ± 1.82 weeks in Group-B. (Table No. I) Patients were distributed according to gender showing that 54%(n=54) in Group-A and 47%(n=47) were male while 46%(n=46) in Group-A and 53%(n=53) in Group-B were females. (Table No. 2) Mean birth weight of the children was calculated as 2.18 ± 0.15 in Group-A and 2.16 ± 0.15 in Group-B. (Table No. III) Mean temperature of the children was calculated as 94.63 ± 1.07 in Group-A and 94.84 ± 1.02 in Group-B. Hypothermia was recorded in 69%(n=69) in Group-A and 45%(n=45) in Group-B while remaining 31%(n=31) in Group-A and 55%(n=55) in Group-B had no findings of the morbidity, p value was calculated as 0.000 showing a significant difference between the two groups. (Table No. II)

Table I: Mean Gestational Age of the Mothers (n=200)

Gestational age (in weeks)	Group-A (n=100)	Group-B (n=100)
	Mean \pm SD	Mean \pm SD
	33.54 ± 1.76	33.46 ± 1.82
Birth weight	2.18 ± 0.15	2.16 ± 0.15
Temperature	94.63 ± 1.07	94.84 ± 1.02

Table II: Comparison of frequency of hypothermia conventional method vs plastic bag (n=200)

Hypothermia	Group-A (n=100)	Group-B (n=100)	P value
	No. of patients (%)	No. of patients (%)	
Yes	69(69%)	45(45%)	0.000
No	31(31%)	55(55%)	
Total	100	100	

Discussion

Neonatal hypothermia that is drop of temperature below 36.5 c is leading cause of mild to moderate metabolic stress to death⁸.

A study from Tanzania showed 22% prevalence of hypothermia among new born. Hypothermic neonate had three-fold increase risk of mortality.^{9,10} The prevalence of hypothermia is very high in hospital accounting 32 to 85 % and in home about 11 to 92%.²

In our study, mean gestational age of the mothers was recorded as 33.54±1.76 weeks in Group-A and 33.46±1.82 weeks in Group-B. 54%(n=54) in Group-A and 47%(n=47) were male while 46%(n=46) in Group-A and 53%(n=53) in Group-B were females hypothermia was recorded in 69%(n=69) in Group-A and 45%(n=45) in Group-B while remaining 31%(n=31) in Group-A and 55%(n=55) in Group-B had no findings of the morbidity, p value was calculated as 0.000 showing result in favour of plastic bag. These result were consistent with the study of H.K Oatley study.¹⁰

E Leadford et al studied that by using plastic bags 40.8% preterm lowered their temperature from normal range as compare to 67.3% preterm who become hypothermic with conventional methods (blanket or radiant warmer).¹

Belsches TC and others tested the hypothesis on neonates that plastic bags reduce hypothermia at 1 hour after birth. Neonates in the plastic bag group had a lower rate of hypothermia (60% vs 73%, risk ratio 0.76, confidence interval 0.60-0.96, P = .026).¹¹

Vohra et al in another study had shown higher mean rectal temperature of 36.5° C±0.8° C in wrapped group compared to 35.6° C±1.8° C in control infants, however one hour later, mean rectal temperature was similar in both the groups¹². These observations support our outcome.

A recent Cochrane review should that plastic bags reduced he loses by 0.7C in neonates of I< 28 weeks with a 44% reduction in hypothermia.⁷ Another study showed that there is no significant differences in mean core body (axillary temperature °C) recorded at 5th, 10th, 15th, 30th and 60th minutes of life but neonates in the intervention group achieved higher temperatures more quickly.¹³ Similarly, Cardona-Torres and colleagues demonstrated that infants with bags with mean axillary temperature of 36.5 °C at 30 minutes compared to 75 minutes for those receiving routine care.⁹

Farhadi et al from Iran showed there is deduction of hypothermia in a group with plastic bag as compare to control. Study should significant reduction in incident of hypothermia and

time of resuscitation in neonates wrapped in Zipcif (P=0.000) and (P=0.017) respectively.¹⁴

Sunita et al showed that by using occlusive wrapping of neonates < 31week have higher temperature then non group 36.94 +/- 0.56C Vs 35.04 +/-1.08C respectively P=0.001. Kent et al observed improved temperature in neonate <31 week of temperature.¹²

The findings of our study justify the hypothesis that the “By using plastic bag reduces the hypothermia as compared to the conventional method in preterm and low birth weight neonate”.

Our data may be considered as primary in our setup and other trials are required to validate our findings.

Conclusion

We concluded that by using plastic bag we reduce the hypothermia instead of the conventional method in preterm and low birth weight neonate To know about its cost effectiveness and long term impact we need more studies.

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