

Original Research Article

Knowledge regarding prevention of hypothermia in newborns among mothers in Northern India

Mahvish Qazi¹, Najmus Saqib^{2*}, Rohit Raina³

¹Department of Gynaecology and Obstetrics, Government Medical College, Doda, Jammu and Kashmir, India

²Department of Paediatrics, Government Medical College, Jammu, Jammu and Kashmir, India

³Department of Gynaecology and Obstetrics, Indraprastha Apollo Hospital, New Delhi, India

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*Correspondence:

Dr. Najmus Saqib,

E-mail: shstar321@gmail.com

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ABSTRACT

Background: Neonatal hypothermia is increasingly recognized as a risk factor for newborn survival. World Health Organization (WHO) recommends maintaining a warm chain and skin-to-skin care for thermo-protection of newborn children. Since little is known about practices related to newborn hypothermia, this study's goal was to assess the knowledge of mothers of newborns especially LBW babies on prevention of hypothermia and to provide them the knowledge of cost-effective thermal protection measures.

Methods: It was a cross-sectional study using pre-tested, pre-structured questionnaire. 108 postnatal mothers having LBW babies admitted in postnatal wards of Government Medical College, Jammu, Jammu and Kashmir, India were included in the study and analysed using SPSS version 20.

Results: Out of 108 mothers, maximum mothers were of age less than 25 years (51%), 60% were from rural area, residing in nuclear family were 62%. Mothers attended hospital for confinement were 95% and 85% started breast feeding their babies. 45% had knowledge of keeping the baby warm by immediately wiping the baby and only 3% mothers had knowledge of Kangaroo Mother Care (KMC).

Conclusions: Understanding and addressing community-based practices on hypothermia, prevention and management might help to improve newborn survival in resource-limited settings. Possible interventions include the implementation of skin-to-skin care in rural areas and the use of appropriate, low-cost newborn warmers to prevent hypothermia and support families in their provision of newborn thermal protection. Training family members to support mothers in the provision of thermo-protection for their newborns could facilitate these practices. Those who fail to fully attend antenatal clinics should be targeted for newborn care education.

Keywords: Hypothermia, Knowledge of mother, LBW baby

INTRODUCTION

The transition from intrauterine to extra uterine life is perhaps the greatest challenge. The period from birth to

28 days of life is called neonatal period and the infant in this period is termed as neonate or newborn baby.¹ This is the phase in life with greatest risk of mortality as well as the maximum potential for long term physical and neuro

cognitive developmental stress.² The neonates are at risk for various health problems. NFHS-4 data reveals the true picture, under 5 mortality in India is 50 and Infant mortality rate of 41 per 1000 live births. Jammu and Kashmir state figures are 38 and 32 respectively. Neonatal hypothermia defined by WHO as axillary temperature less than 36.5°C (97.7°F). Low birth weight (LBW) in babies is defined as birth weight less than 2.5 kg and also includes premature babies.³ LBW infants are approximately 20 times more likely to die, compared with heavier babies.⁴

Thermal control remains poor in newborn owing to immaturity of the thermoregulatory centre and newborn become vulnerable to hypothermia especially premature babies, intrauterine growth retardation and LBW babies and even normal babies. The WHO stated that approximately 125 million infant born every year, 8 million die before reaching one year of life due to various complications among that about 2.5% newborn die due to hypothermia.⁵ Hypothermia is a common problem in neonates particularly in developing countries where it is an important contributing factor to neonatal mortality and morbidity especially in the immediate neonatal period also considered as silent killer in neonates.⁶ Many studies have been done, especially in the developing countries in a controlled environment as well as in the community to study the burden of hypothermia and its effects.^{7,8} A number of studies have also been done in low-resource settings to show the burden of hypothermia.^{9,10} To decrease the neonatal mortality rates, prevention and treatment of hypothermia are one of the important therapeutic principles during and after resuscitation in both developing and developed settings.^{11,12} A few studies have shown the temperature instability owing to the gestation of the neonates and also LBW of the neonates.¹³⁻¹⁵

The important cause adding to the above physiological risk factors is, ignorance related to newborn care, separation of baby from mother, cold environment, change of temperature, inadequate warming, excessive loss of heat.¹⁶ The various clinical signs of neonatal hypothermia are skin temperature less than 36.5°C, hands, feet, abdomen are cold to touch, weak and lethargy, bluish extremities, slow heart rate and irregular respiration.¹⁷ A baby under cold stress wastes own energy and oxygen in trying to maintain body temperature. The various consequences of neonatal hypothermia are hypoxia, hypoglycaemia, respiratory distress, neonatal jaundice, sudden infant death syndrome and impaired cardiac function. Thermoregulation is one of the challenging aspects of neonatal care.^{6,18} In most countries, the use of incubators is standard for thermal care of LBW babies. However, "incubator care" is not widely available in developing countries. Even in the limited cases where incubator care is available, the use of this method can be very challenging. Problems such as poor maintenance, power outages and lack of replacement parts reduce the number of available

functional incubators. In addition, excess demand resulting from too many LBW/preterm newborns and insufficient machines results in many babies sharing an incubator. This practice, along with inadequate disinfection of incubators, can lead to increased infection rates. Since, it largely excludes the participation of the mother, incubator care can also lead to decreased breastfeeding and maternal-newborn bonding.

WHO has provided guidelines for thermal care in low-resource settings and the 10-step warm chain that need to be promoted for both home and facility births.^{3,19} Mastering the art of maintaining the neutral thermal environment is one of the most influential and cost effective interventions to be practiced by all. Improving newborn survival is a natural priority in child health today.²⁰ Apart from intrinsic problems in LBW neonate, the thermal control in them is greatly influenced by knowledge and practice of caregivers specifically mother.^{21,22} A specific recommendation is to delay bathing for at least 6 hours after birth showed that bathing of newborns increased hypothermia even in the presence of skin-to-skin contact and the use of warm water.³

METHODS

It was a cross sectional study. A systematic sampling technique was adopted to select 108 mothers for the study. The criteria for selection of sample was mothers of those LBW babies who were admitted in postnatal wards of Government Medical College, Jammu, Jammu and Kashmir, India gave informed consent and are available during data collection period.

Exclusion criteria

Mothers of neonates who were severely ill at the time of data collection. Mothers who refuse to participate.

Study tool

Responses got from the mothers of LBW neonates to the questions stated in the pre-tested, pre structured questionnaire regarding prevention of hypothermia. The questionnaire consisted of both close and open-ended questions addressing the neonate's and parent's socio-demographic data, antenatal and birth history of the neonate, mother's knowledge on the WHO essential newborn care practices. Knowledge was assessed by closed ended and open-ended questions and analysed using SPSS version 20.

RESULTS

Present study on 108 mothers had the following results. Maximum mothers were of age less than 25 years (51%), 44% were aged between 25-30 years (Table 1). In this study, 60% mothers were residing in rural area and 40% in urban area (Table 2). Literacy status of mothers as evidenced was 33% illiterates, 32% studied up to

primary, 25% were 10th pass and only 9% were graduates (Table 3). Most of the mothers (66%) were house wives, 25% were labour class and 9% were professionals (Table 4). It was seen that 95% babies were delivered at hospital and only 5% home delivered. Of 95% babies, 52% were inborn and 43% out born (Table 5).

Most of mothers (62%) belong to nuclear family and rest 38% had joint family (Table 6). It can be observed from Table 7 that in all age groups, 44% mothers could assess baby's temperature by touching head, 38% on touching extremities had correct knowledge of identifying neonate's temperature. Regarding knowledge on prevention of heat loss, 45% of mothers had knowledge of drying the baby immediately, 36% agreed to transport the baby immediately, skin to skin contact practiced only by 11% of mothers and rest of mothers rely on breast feeding as a mode to prevent heat loss (Table 8). 85% of mothers breastfeed their babies and only in 15% it was not satisfactory for various reasons (Table 9).

About 52% of mothers knew refusal to feed as a sign of hypothermia, 22% could mark their baby lethargy and 15% felt their babies extremities cold (Table 10). Association of concept of bathing the newborn as a cause of hypothermia was observed in 15% of mothers. 45% mothers knew that not wiping the baby or not drying after birth may cause hypothermia. Only 54% mothers had knowledge of covering the baby with warm blanket or clothes in multiple layers to prevent heat loss, 34% of mothers rely on continuous breast feed, 9% knew time to time checking of baby's skin temperature and only 3% of mothers were aware of the knowledge about KMC (Table 11).

Table 1: Distribution of cases on the basis of age.

Mother's age	Number	Percentage
<25 years	55	51
25-30 years	47	44
31-35 years	6	5

Table 2: Distribution of cases on the basis of residence.

Place of residence	Number	Percentage
Urban	43	40
Rural	65	60

Table 3: Distribution of cases on the basis of educational status.

Educational level of the mother	Number	%
Illiterate	36	33
Primary	35	32
10 th pass and above	27	25
Graduate	10	9

Table 4: Distribution of cases on the basis of profession.

Profession of mothers	Number	%
House wife	71	66
Labourers	27	25
Professional	10	9

Table 5: Distribution of cases on the basis of place of delivery.

Place of delivery	Number	Percentage
Outborn	46	43
Inborn	56	52
Home delivery	6	5

Table 6: Distribution of cases on the basis of type of family.

Type of family	Number	Percentage
Nuclear	67	62
Joint	41	38

Table 7: Distribution of cases on the basis of body part to touch.

Body part to touch	Number	Percentage
Head	47	44
Extremities	41	38
Chest and abdomen	12	11
Whole body	8	7

Table 8: Distribution of cases on the basis of measures taken for thermoregulation.

Measures taken	Number	Percentage
Immediate drying	49	45
Open transport	39	36
Skin to skin contact	12	11
Breast Feeding	8	7

Table 9: Distribution of cases on the basis of breast-feeding practices.

Breast feeding practices	Number	Percentage
Yes	92	85
No	16	15

Table 10: Distribution of cases on the basis of danger signs.

Danger sign of Hypothermia	Number	Percentage
Refusal of feeding	56	52
Lethargy	24	22
Extremities feel cold	16	15
Vomiting	12	11

Table 11: Distribution of cases according to mothers knowledge on causes of hypothermia.

Mother's knowledge on causes of hypothermia	Number	%
Not wiping the baby	48	45
Wiping the baby	34	31
Giving bath to baby	16	15
Weighing the baby	10	9
Method of Transportation to Hospital		
Dress the baby with warm blanket	58	54
Immediate breast feeding	37	34
Monitor the baby temperature	10	9
Kangaroo mother care (KMC)	3	3

DISCUSSION

The body temperature of the neonate in utero is generally 0.5°C higher than the mother's temperature and there is rapid cooling of core temperature at the rate of 0.1 °C and skin cooling at the rate of 0.3°C after delivery.²³⁻²⁵ Few studies showed that there is hypothermia in just 1% of the neonates immediately after birth while most of them start maintaining the temperature by 24 hour of life.²⁵ Very few studies of Indian origin are available to know the prevalence of hypothermia in India. The present study was conducted in the postnatal wards in a hospital where the warm chain is maintained from the time of birth of the baby by drying the baby immediately, delaying the bathing, placing the baby next to the mother. In spite of all the measures, mild to moderate hypothermia was noticed in the postnatal wards. In present study, 51% of mothers were less than 25 years age and less responsive towards hypothermia. 60% of mothers of rural area were not aware of prevention of hypothermia.^{6,20} Lack of knowledge among health workers and mothers of simple methods to maintain the warm chain from birth has been found to be the most common factor contributing to hypothermia.^{6,26-28} Studies mostly from South Asia include insufficient heating of the birth place, placing the uncovered newborn on the ground or other cold surfaces, delayed wrapping and early bathing all contributing to hypothermia.²⁹⁻³¹ A study from Dhaka, Bangladesh explained that babies were typically bathed soon after birth to purify them from the birthing process.³² In Nepal, less than half of newborns were wrapped within the first 10 minutes after birth and almost all of them were bathed within minutes or hours after birth.^{33,34} This signifies the need to educate people about hypothermia in detail. 33% of illiterate mothers had lack of knowledge of newborn care. 62% of mothers living in nuclear family had insufficient knowledge regarding how to keep the baby warm after birth. Zambian study had also similar results.²¹ This study found that the mothers still need more knowledge to prevent the baby from heat loss. A study done in Laos showed that antenatal education in expectant mothers resulted in sustained improvement in knowledge of newborn care in the postnatal period.³⁵ Studies carried out in low-income countries showed that

prolonged skin-to-skin contact between the mother and her LBW infant, as in KMC, provides effective thermal control and may be associated with a reduced risk of hypothermia.³⁶

Due to increase in awareness and facilities by Government, 95% of babies were delivered in hospital which is very encouraging. Out of that 52% were inborn and 43% were outborn. There were only 5% home deliveries mainly preterm delivery. These mothers need to improve their knowledge and be prepared before child birth.^{6,17,37} In survival of LBW babies, crucial factor is to know body temperature in them at the earliest. Mothers had knowledge of knowing body temperature by touching head of babies (44%) and 38% on touching extremities.¹⁷ Hypothermia is more caused by lack of knowledge than lack of equipment. Only 44% mothers believed in drying the baby immediately to prevent heat loss and 11% of mothers had proper knowledge of skin to skin contact which is the most reliable measure for prevention of heat loss. Similar results found in other studies also.²¹ Refusal to feed as a sign of hypothermia was appreciated by 52% of mothers and 22% could mark their baby less active or lethargy. Senarath U et al, also found that only 11% of Sri Lankan expectant mothers were educated on danger signs.³⁸ The danger signs recognized by majority of mothers were jaundice, fever, irritability, difficulty in breathing, diarrhoea and vomiting. Senarath U et al, also found that hypothermia was less recognized compared to fever.³⁸ Studies in developing countries have shown discouraging results on knowledge of danger signs among postnatal mothers.³⁹ The data showed that majority of postnatal mothers had poor knowledge regarding signs, symptoms and complications of hypothermia in newborn. Similar results were found in studies conducted in UP and Zambia.^{21,37} Almost 85% of mothers had followed practice of exclusive breast feeding for their babies. These findings were similar to Sri Lankan postnatal mothers with more than 90% awareness of breastfeeding on demand as well as early and exclusive breastfeeding.³⁸ A Ghanaian study suggesting all-cause neonatal mortality could be reduced by 16.3% if all infants initiated breastfeeding on day 1 of life and by 22.3% if initiation took place within the first hour.⁴⁰ Kloeblen-Tarver AS et al, showed a direct correlation between maternal attitude and optimal breastfeeding practices.⁴¹

Wiping the babies is practiced by 31% of mothers to protect from hypothermia and many thought baby bath should not be done or must be postponed.¹⁸ Hypothermia during transfer is also an aggravating factor which should be avoided. 54% of mother had knowledge of covering the baby in layers of cloth and blankets and only 3% of mothers were aware of KMC to protect the baby from hypothermia during transport.^{20,21,37} However, the warm chain as recommended by the WHO as the standard of care of newborn baby was not consistently maintained during the first hours after delivery, when newborns are at greatest risk.^{3,19} Community members in the study area

were not familiar with skin-to-skin care and did not practice it.^{18,42} Various studies conducted globally also showing similar knowledge and practice among mothers.^{6,21,37} Antenatal clinic attendance was a significant predictor of poor knowledge in sharp contrast to a Sri Lanka study which showed no association between the two.³⁸ Findings suggest that in the setting, antenatal clinics provide an opportunity to educate mothers on newborn care.

This study was based on reported rather than observed knowledge towards newborn care practices. There was therefore a risk that mothers may report what was expected of them, but their actual practices may be different. Lack of universal census on definition of good or poor knowledge posed a challenge in the study. As the study was carried out among postnatal mothers in Government Medical College, Jammu, Jammu and Kashmir, India, findings may not be generalized to the whole country. This study focused on neonatal hypothermia, other major underlying factors of newborn care such as resuscitation and clean delivery practices need to be taken into account to explain poor newborn survival and devise optimal strategies and programs to improve newborn survival.

CONCLUSION

Understanding and addressing community-based practices on hypothermia, prevention and management might help to improve newborn survival in resource-limited settings. Infants born small or prematurely are recognized as needing more intense thermal protection. Possible interventions include the implementation of skin-to-skin care and support families in their provision of newborn thermal protection. Training family members to support mothers to promote breastfeeding. KMC is suitable for LBW babies with no medical problem. Mother and baby should be kept together in a warm room. Hypothermia is caused more by lack of knowledge than lack of equipment. Poor knowledge on essential newborn care practices was associated with first time mothers and those who fail to attend antenatal clinic. More focus should be placed when educating these vulnerable groups. Health education on essential newborn care practices should be integrated into routine antenatal services and re-emphasized in the postnatal period to help improve maternal knowledge and attitude towards essential newborn care practices.

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