

Newborn care under infant warmer health essay



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Thermoregulation is the ability to balance between heat production and heat loss in order to maintain body temperature within a certain normal range.

The provision of a thermo neutral environment is an essential component of the immediate and longer term care of newborn infant. Cold stress and hyperthermia may have serious metabolic consequences for all newborn. In the preterm these consequences may be devastating and may increase both morbidity and mortality rates. Health professionals have a responsibility to be aware of and to ensure that the thermoregulatory needs of an infant are upheld in order to provide them with the best start possible. Current medical literature lack well designed prospective, randomized controlled trials for both diagnosis and intervention of providing thermoneutral environment and systematic review report that none of the intervention has serious adverse effects.

Aim

This prospective study compared newborn care under infant warmer with method of warming babies that provided immediate skin contact. Fifteen infants were randomly assigned under infant warmer. One group of fifteen newborns was exposed to continuous skin to skin contact with their mother. Skin temperatures of thirty newborns were noted every one minutes to thirty minutes using mercury thermometer. Result supported the hypothesis that body temperature would be warmest in experimental babies given the earliest skin to skin contact, less warm in experimental infant beginning skin to skin contact after initial nursing care.

Comparison between kangaroo care and infant warmer care for term baby in preventing hypothermia

INTRODUCTION

Most expectant parents anticipate an emotionally satisfying and medically safe childbirth experience. Each family, nurse-midwife, and physician will have a unique perspective on the relative values of emotional and medical needs and the compromises necessary to attain them.

One facet of the potential conflict between safety and emotional satisfaction is the manner of handling the infant immediately after birth. It is standard procedure at many hospitals to rapidly clamp and cut the umbilical cord in order to expedite the newborn's transfer to a radiant heated crib. There, the baby will be dried and given the initial nursing care and evaluation. These procedures frequently take place beyond the range of vision of the mother on the delivery table and consume at least 5 to 10 minutes. Sometimes the snugly wrapped infant will then be held aloft or brought over so the mother can see her baby's face. Upon request, she may be allowed to hold her baby for a while. More often, the newborn is left in the radiant heater away from the delivery table while everyone is busy with the mother. Parents who request immediate and continuous skin-to-skin contact with their child from the moment of birth find themselves in conflict with medical and nursing personnel who feel it is their responsibility to protect the neonate from heat loss in the cold, drafty delivery room.

The more relaxed atmosphere of birthing rooms may provide a solution for some, but for those who choose to use the delivery room, it is questionable

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whether the current method of minimizing neonatal heat loss is actually the most effective

Hypothermia at birth is a worldwide problem. All infant needs to maintain specific thermal control in order to survive. The WHO (world health organization) defines mild hypothermia as a core body temperature of 36. 0°C to 36. 4°C, moderate hypothermia as 32. 0°C to 35. 9°C and severe hypothermia less than 32. 0°C. The rapid decline in temperature is mainly due to physical characteristics of the newborn and environmental factors of the delivery area. Typically a wet newborn with a high surface area to volume ratio moves from a warm aqueous uterine environment into a cooler dry delivery room. The newborn immediately loses heat by evaporation, convection, conduction and radiation depending on the ambient air temperature and humidity as well as the temperature of surrounding surfaces.(Mullany, L. C(2010). Neonatal Hypothermia Labour Room," Elsevier Amsterdam

What is Kangaroo Care?

A universally available and biologically sound method of care for all newborn, but in particular for premature babies, with three components,

Skin to skin contact.

Exclusive breastfeeding.

Bonding

1) Skin to skin contact is between the baby front and the mother's chest. The more the newborn with mother's skin contact the better, while the mother's skin will help regulate the infant's temperature, cover the infant's back and mother's chest with warm, dry cloth. For comfort a small nappy is fine, and for warmth a cap may be used. Skin to skin contact should ideally start at birth, but is helpful at any time. It should ideally be continued day and night, but even shorter periods are still helpful.

2) Exclusive breast feeding means that for an average mother, expressing from the breasts or direct suckling by the baby is all that is needed.

3) Bonding means that whatever is needed for the medical, emotional, psychological and physical well being of mother and baby is provided to them, without separating them.

Early skin to skin contact also provides benefit to both the mother and infant independent of its role in establishing breast feeding. Thermal control is an essential component of preventing neonatal morbidity, particularly in low birth weight infant, and skin to skin contact provide an inexpensive, safe and effective method for maintaining newborn temperature

Skin to skin contact has been shown to be as effective as incubator care for re-warming of hypothermic infants and infants placed in skin to skin contact their mother were significantly warmer than infants placed in cots likely because of the thermal response of maternal skin temperature in reaction to skin to skin contact with her infant. Other benefits of skin to skin contact include better cardio-respiratory stability in late preterm infants. (Dr. Bergman, N(2005)

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Infant radiant warmer

The infant warmer is typically used for very unstable infants or during the performance of medical procedure. Heating is provided by radiation and therefore does not prevent convective and evaporative heat loss. The temperature can be maintain in the “ servo mode ” (skin probe) or the “ nonservo mode”(manual mode), which maintains a constant radiant energy output regardless of the infant’s temperature.

Infant warmers allow accessibility to infant but cause large evaporative heat with water losses and slightly higher basal metabolic rates than the incubator. Use of the infant warmer is dictated by the infant’s clinical and medical needs. (Tricia Lacy Gomella sixth edition pg 45-46)

Surface temperature distribution is more uneven in infants nursed under infant warmers. The peripheries are cooler than in infants nursed in incubators with the same mean skin temperature. Infant warmers therefore produce a fluctuating asymmetrical thermal environment compared with constant, even environment provided by an incubator.

No study has shown that either method is superior to the other in terms of mortality, morbidity and growth of infants nursed in them. Infant warmers are, however, potentially more dangerous than incubators. Overheating from probe detachment or interference can occur quickly. It is important therefore that the infant’s surface or deep body temperature is monitored frequently by means of an independent thermometer.

Methodology

Study Design

This study was conducted at the labour room at Hospital Sultanah Bahiyah. It was a prospective descriptive study on term baby comparing the skin to skin contact and infant warmer (which was the usual practice) in preventing hypothermia.

Sample & Sampling method

Term neonates born at the labour room Hospital Sultanah Bahiyah were selected randomly with the inclusion and exclusion criteria below.

Inclusion Criteria:

Term babies

Good crying

Good breathing effort

Good muscle tone

No meconium stained liquor

Exclusion criteria:

Prem Babies

Ineffective breathing pattern

Poor tone

Meconium stained liquor

Neonates with the inclusion criteria were included in the study and were randomly distributed into two arms, i. e. neonates for kangaroo care and neonates for Infant warmer care.

Firstly, for laboring women whose baby chosen for kangaroo care were explained to about the concept of kangaroo care and its benefits for mothers and baby. After birth and cord clamped, the baby was placed in warm blanket on mother's abdomen. The baby was dried and sucked as needed while on mother's abdomen. The wet blanket was removed and baby was allowed for skin-to skin care by the mother. The baby was covered with clean warm blanket and the ID bands were placed. The injection was delayed after half an hour. Baby's skin temperature was monitored at 1 minute, at 5 minutes, at 10minutes, at 15 minutes, at 30 minutes with thermometer. The breast feeding support was given to mother.

For baby receiving infant warmer care, baby was placed under infant warmer after birth and cord clamped. The baby was dried and sucked under infant warmer with manual mode (temperature setting at 36.5°C - 37°C). Wet blanket was removed and baby was swaddled in a clean warm blanket. Baby's skin temperature was monitored at 1 minute, at 5 minutes, at 10minutes, at 15 minutes, at 30 minutes with thermometer.

Axillary temperature was measured with mercury thermometer.

Temperature was measure with standard method which thermometer was placed under the axilla for 2 minute before reading the temperature.

Fifteen neonates were included in each arm of the care. The data was documented in data collection sheet. The data was analyzed by SPSS and t-test was used to analyze the data.

Period of study

Within one month (September 1, 2011 till December 30 2011)

Data collection Techniques

The researchers have designed a data collection sheet to collect data by direct observation after the delivery at the labour room. The data collection sheet was pre tested by doing a pilot study.

Ethical Consideration

There were no ethical issues in this study as it is only a descriptive study on the temperature of newborns and did not involve any intervention.

Problem Analysis Chart

Cold environment $<26^{\circ}\text{C}$

Gestational age

Condition of the baby

Baby

Radiant warmer

Linen

Skin to skin

Method of warming

Environment in labour room

Preventing Hypothermia of neonate in labour room

Routine Procedure

Birth weight

GRAPH 1: COMPARE THE MEAN TEMPERATURE OF SKIN TO SKIN AND INFANT WARMER FROM 1 MINUTE TO 30 MINUTES

This line graph shows that mean temperature of skin to skin contact was steadily increase compare to infant warmer form the 1 minute to 30 minutes. The mean temperature of skin to skin contact was always higher then infant warmer group. The mean temperature of infant warmer form 1 minute to 10 minutes was increasing trend from 36.43°C to 36.6°C . The temperature was static from 10 minute to 15minute (36.62°C - 36.61°C).

GRAPH 2: COMPARE THE MEAN TEMPERATURE OF SKIN TO SKIN AND INFANT WARMER AT 1 MINUTE

GRAPH 3: COMPARE THE MEAN TEMPERATURE OF SKIN TO SKIN AND INFANT WARMER AT 5 MINUTES

GRAPH 4: COMPARE THE MEAN TEMPERATURE OF SKIN TO SKIN AND INFANT WARMER AT 10 MINUTES

GRAPH 5: COMPARE THE MEAN TEMPERATURE OF SKIN TO SKIN AND INFANT WARMER AT 15 MINUTES

GRAPH 6: COMPARE THE MEAN TEMPERATURE OF SKIN TO SKIN AND INFANT WARMER AT 30 MINUTES

Term babies born in labor room

Process of Care

ASSESSMENT

Inclusion Criteria:

Term babies

Good crying

Good breathing effort

Good muscle tone

No meconium stained liquor

Exclusion criteria:

Premature Babies

Ineffective breathing pattern

Poor tone

Meconium stained liquor

Monitor Temperature

Monitor Temperature

Radiant warmer and swaddled

Skin to skin contact

1 minute

1 minute

5 minutes

5 minutes

10 minutes

10 minutes

15 minutes

15 minutes

30 minutes

30 minutes

OBJECTIVE

To assess effectiveness “ skin to skin” contact to prevent hypothermia.

Specific Objective:-

To determine the frequency of hypothermia among term newborn in Labour room.

To evaluate the efficacy of “ skin to skin” for newborn in the labour room.

To recommend better measures to prevent hypothermia

RESULTS

TABLE 1: DEMOGRAPHIC DATA OF THE SKIN TO SKIN CONTACT AND INFANT WARMER GROUP.

SKIN TO SKIN CONTACT

INFANT WARMER

MEAN GASTATIONAL AGE

38. 8 weeks

38. 8 weeks

FEMALE/ MALE (frequency)

6/9

8/7

MEAN WEIGHT

2. 978 kg

3. 18 kg

MEAN HEIGHT

49. 6 cm

50. 7 cm

MEAN HEAD CIRCUMFERENCE

33 cm

32. 9 cm

NUMBER OF NEONATE

15

15

The mean gestational age of the skin-to-skin contact and infant warmer group were similar, 38. 8 weeks of gestation. The growth parameters (mean weight, height and head circumference) were quite similar in both groups. However, there were more male babies in skin to skin contact group compared to infant warmer group

TABLES 2: MEAN (STANDARD DEVIATION) TEMPERATURE OF THE KANGGAROO CARE AND INFANT RADIANT WARMER

MEAN (\pm STANDARD DEVIATION)

(\hat{t} ° C)

TIME

SKIN-TO-SKIN CONTACT

RADIANT WARMER

1 MINUTE

36. 46 (0. 5)

36. 43 (0. 4)

5 MINUTE

36. 61 (0. 4)

36. 53 (0. 3)

10 MINUTE

36. 66 (0. 3)

36. 62 (0. 24)

15 MINUTE

36. 6 (0. 4)

36. 61 (0. 24)

Table 2 shows the mean temperature of term babies for skin to skin contact & infant warmer. The mean temperature of both arms was hypothermic at 1 minute (36. 46 \pm 0. 02 $^{\circ}$ C for skin- to -skin contact and 36. 43 \pm 0. 02 $^{\circ}$ C for infant warmer). This shows that both arms were rewarmed to the quite similar temperature at 1 minute but mean temperature at 5 minutes shows more marked difference between this two arms. i. e the skin- to -skin contact arm was rewarmed to mean temperature more than 36. 5 \pm 0. 02 $^{\circ}$ C, the Infant warmer arm mean temperature was around 36. 5 \pm 0. 02 $^{\circ}$ C

Both arm shows more rapid increase in mean temperature from 1 minute to 10 minutes. The temperature increment for skin to skin contact and infant warmer were 0. 2 \pm 0. 02 $^{\circ}$ C and 0. 19 \pm 0. 02 $^{\circ}$ C respectively. The warming effect slowed down after 10 minutes. The temperature increment from 10 minutes to 30 minutes was 0. 03 \pm 0. 02 $^{\circ}$ C for skin to skin temperature and 0. 05 \pm 0. 02 $^{\circ}$ C for infant warmer.

Both arms were warmed to mean temperature between 36. 65 \pm 0. 02 $^{\circ}$ C and 36. 7 \pm 0. 02 $^{\circ}$ C at 30 minutes.

TABLE 3: THE FREQUENCY OF HYPOTHERMIA FOR TERM BABIES IN SKIN TO SKIN CONTACT AND INFANT WARMER GROUP AT 1 MINUTE.

Temperature at 1 minute

Skin to skin contact

Infant warmer

Total

<36.5 °C

8 babies

8 babies

16 babies

≥ 36.5

7 babies

7 babies

14 babies

Total

15 babies

15 babies

30 babies

There was 16 out of 30 (53.3%) babies in this study suffering from hypothermia at 1 minute after birth

DISCUSSION

This study shows that skin to skin contact is more superior than infant warmer in maintaining body temperature in term newborn after birth. This is

consistent with other studies Judith A. Fardiz. 1980 did study on comparing skin to skin and infant warmer in promoting neonatal thermoregulator. Her study showed that body temperature would be warmest in experimental babies given the earliest skin to skin contact, less warm in experimental infants beginning skin to skin contact after initial nursing care, and coolest in control babies given no skin to skin contact with their mothers

Both skin to skin contact and infant warmer were effective in maintaining body temperature to prevent hypothermia with the evidence that the mean temperature of skin to skin group increased from 36.46° C at 1 minute to 36.69° C at 30 minutes and the mean temperature of infant warmer increased from 36.43° C to 36.67° C at 30 minutes.

The skin to skin contact minimizes losses through 4 mechanisms.

Evaporative losses were reduced by rapidly drying the infant after delivery even before the umbilical cord was cut. Positioning the babies on the mother's bare chest provided a source of radiant heat from her body and decrease radiant loses from the baby to cold wall, windows, and metal surfaces. Skin to skin contact with the mother also eliminated major heat loses through conduction to cold object. The warm blanket covering both mother and baby protected the infant well from convection current.

Neonate in radiant heater, even when wrapped in blanket appeared more vulnerable to cooling by convection current in the drafty delivery room. This also explained the result that skin to skin contacts were more reliable in increasing the mean temperature compared to infant warmer.

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CONCLUSIONS

Skin to skin contact was demonstrated to be of physiologic method of warming newborn that avoided the risk of hypothermia, hyperthermia and other potential hazard of infant warmer. Further study of this heater has been recommended to the administration to establish whether or not routine use of such equipment in the delivery room poses serious risk cause of dehydration, burns, and cataract of retinal vision from a emissions. Skin to skin contact is a safe alternative, demonstrated to be more effective in the present study that infant warmer in providing healthy term infant with neutral thermal environment.

In addition to the thermal benefits of skin to skin contact, the close proximity of the baby to the mother gave them an early opportunity to become acquainted. A newborn first physiologic reactivity period spends the initial 30 minute after birth. With the mother holding the baby throughout this period the parent were able to take advantage of their babies heightened arousal and responsiveness to make eye contact, explore, and soothe the baby.

RECOMMEDATIONS

The complexity of neonates care as exploded in recent years to include many techniques and manipulation of fragile patient. A postpartum study comparing skin to skin contact and incubators as method of rewarming cool babies would be a logical extension of the research. After delivery, place the newborn directly on mother's chest, prone, with newborns skin touching the mother's skin. While the mother's skin will help regulate the infant's

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temperature, cover the infant's back and mother's chest with warm blanket, covering the infant's head to prevent heat loss.

If possible keep mother and infant in this position for at least first hour of life, delaying any routine procedures, and providing frequent supervision to detect any complications. Care must be taken to provide an uninterrupted source of infant warming adequate not only to maintain body temperature but also to reduce thermal stress and the metabolic demand associated with it. Skin-to-skin contact does not have to be limited to the delivery room but should be practiced as frequently as possible during the first days of life in order to maintain infant temperature, promote frequent breast feeding and enhance maternal-infant bonding.

Although significant differences in newborn temperature were shown in this series of 30 babies, replication of the study with even larger numbers would strengthen the finding.

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