Kangaroo Care for Low Birth Weight Babies

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The basic needs of a Low Birth Weight (LBW) infant include love, touch, warmth, safety and security. These needs of these high-risk group infants must be met whether they are admitted in Neonatal Intensive Care Units (NICU) or transferred to their mother’s side. Nurses working in NICU play a vital role in providing an individualized comprehensive care for high risk LBW babies based on their needs. The health team members should always remember to include the mothers of LBW babies who are admitted into nurseries for intensive care. An innovative approach to include mother in her baby’s care in NICU is Kangaroo Care (KC).

Kangaroo Care, also known as Skin-to-Skin care, is becoming very popular throughout the world. In developing countries, where less health facilities and resources are available, KC has become an alternative way of caring for LBW babies due to lack of incubators. In most of the developed countries KC is widely practiced in NICU. It offers an easy and practical replacement for incubator and also a way of helping parents to overcome the feelings of separation and inadequacy that frequently accompany preterm delivery. Moran et al (1999) reported that KC is safe for full term and most preterm infants and is believed to be beneficial to both infants and parents.

DEFINITION OF KC:
It is a method in which the mother holds her LBW baby clothed only in a diaper, in an upright prone position, in between her breasts. The baby’s head is turned to one side so that the ear of the bay is above the mother’s heart. The baby is covered with the mother’s gown and a baby sheet and the baby’s face projects out of the top of mother’s gown like a baby kangaroo.

ORIGIN OF KC:
It originated in Bogota, Colombia in 1983 by neonatologists Dr. Edgar Rey and Dr. Hector Martinez. Since the preterm infants and LBW babies in Materno Infantile Hospital, Bogota were dying from infection caused by cross contaminations due to shared incubator care and equipment the mothers of LBW babies were advised to hold the baby in skin-to-skin contact until the babies were stable enough to be discharged from NICU. After the introduction of KC, as a method for providing warmth by mothers, the mortality rate of LBW babies decreased from 70% to 10% in Materno Infantile Hospital, Bogota. [Gale & Vandenbenghe, 1998]

BENEFITS OF KC
For Babies:
- Effective thermoregulation
- Stable heart rate
- More regular breathing
- Decrease in apnea
- Improved O₂ saturation levels
- More rapid weight gain
- More rapid brain development
- Reduction of purposeless movements
- Decreased crying
- Longer episodes of deep quiet sleep
- More successful breast feeding
- Shorter stay in incubator
- Earlier hospital discharge
- Improved survival rate

For Parents:
- Earlier bonding
- Gain confidence to care for their LBW baby
- Improved lactation in mothers
- Decreased cost
- Lessen the feeling of separation and inadequacy
- Self-satisfaction in participating in the care of their baby.

An elaborate study has been envisaged to materialize the effectiveness of KC on management of selected LBW babies admitted into the NICU of Christian Medical College and Hospital, Vellore.

OBJECTIVES:
1. To identify and compare the physiological and behavioral states of LBW babies during routine care (RC) and Kangaroo Care (KC).
2. To determine the mother’s perception about Kangaroo Care.
3. To prepare a protocol for Kangaroo Care intervention in nurseries.

METHODOLOGY
The research design adopted for the study was quasi-experi-
mental research design with the same samples serving as their own control group. The independent variables in the study were the Kangaroo Care and routine care (care of LBW babies in high cradle under warmer or kept well wrapped in low cradle). The dependent variables were physiological and behavioral states of low weight babies.

The study was conducted in the neonatal intensive care units of Christian Medical College and Hospital, Vellore. Non-probability convenient sampling technique was used to select 30 LBW babies and their mothers.

**INSTRUMENT:**
A checklist for assessment and recording of physiological and behavioral states of LBW babies was used.

**A. Physiological state:**
1. **Axillary temperature:** It was checked with an electronic thermometer.
2. **Heart rate and oxygen saturation:** These were measured by using the pulse oximeter.
3. **Respiratory rate:** It was counted by observation of chest movement for one full minute.
4. **Apnea:** The number of apneic spells per one hour was counted.

**B. Behavioral state:**
Modified Brazelton Behavioral Assessment Scale (1984) was used for the assessment of behavioral state.

**Deep quiet sleep state (score - 6):** closed eyes, with no eye or body movement, little or no response to noise or stimuli.

**Active sleep state (score - 5):** movement of extremities, stretching of limbs and body, change of facial expression, eyes closed with eye movement, and started with noise or disturbances.

**Drowsy state (score - 4):** eyes opened or closed and if eyes open, appearing glazed and uninterested, quiet, stable present or slow movement of extremities.

**Quiet alert state (score - 3):** eyes opened, bright and interested in their surrounding and the presence of minimal body movements.

**Active alert state (score - 2):** being, fussy, restless, opened eyes, movement of face, hands and legs.

**Crying state (score - 1):** continuous cry (hasty cry), red face and presence of movement of hands and legs.

**C. Questionnaire:**
A questionnaire containing 15 items were formulated and used to interview the mothers regarding their perception about Kangaroo Care using a five point Likert scale.

**DATA COLLECTION:**
After selecting the LBW babies, the investigator located their mothers in the postnatal wards. The purpose of the study was explained to them and informal consent was obtained. A handout about KC was distributed and the procedure, preparation and timings for KC were explained to them. One or two babies were selected per day. Observations of physiological and behavioral states during routine care and Kangaroo Care were done for one hour on the same selected babies for two consecutive days twice daily with the interval of 3 to 4 hours. Each time, routine care observation was made first followed by Kangaroo Care observation.

During routine care, the temperature, respiratory rate were checked, the heart rate and O2 saturation values were observed from the monitor. All the values were recorded at 0, 15, 30, 45 & 60 minutes. The baby was closely and continuously monitored for presence of apnea during the one-hour session.

After the routine care observation, the mother was called from the ward and made to sit in a comfortable chair after washing hands and loosening her gown. The baby was undressed except for a diaper and was covered with the mother's gown and a baby sheet. Once the mother and baby were comfortable the behavioral and physiological state were assessed at 0, 15, 30, 45 & 60 minutes. On the 3rd day, the mother was interviewed about her perception of KC using a questionnaire.

**DATA ANALYSIS:**
Data were analyzed and interpreted in the light of objectives, using both descriptive and inferential statistics. Test of significance paired t-test, Wilcoxon's signed rank test and Friedman's two ways ANOVA test were used to compare the physiological and behavioral states of LBW babies during routine care and Kangaroo Care.

**FINDINGS OF THE STUDY:**
- Sample characteristics of mothers: The mothers of LBW babies included in the study belong to the age group of 18-35 years. Majority of them (59%) had finished secondary school education and 93% of them were housewives. The average family monthly income of most of the mothers (55%) was above Rs. 3000/-. About 45% were prim para and 62% of them had normal vaginal delivery.
- Sample characteristics of LBW babies: Among the LBW
babies 70% were female babies. Most of them (65%) were preterm babies and about 37% were term small for gestational age babies. Majority of the babies (63%) had their birth weight ranging from 1.5 and 2 kg and about 33% of babies were between 1-1.5 kg and one baby had a birth weight less than 1 kg (950gms). About 14 babies were receiving care in high cradle under warmer and 16 babies were kept well wrapped in low cradle.

A. Physiological State:
- The temperature, heart rate, respiratory rate, and O₂ saturation of LBW babies were maintained within normal ranges during KC and RC.

(i) Axillary temperature:
- The mean temperature of LBW babies during KC (98.8°F) was higher than during RC (98.3°F).
- In RC, the LBW babies were found to maintain a constant temperature.
- During KC, a significant steady rise in temperature was observed among LBW babies.
- None of the babies developed hypothermia during KC.

(ii) Heart Rate:
- The mean heart rates of LBW babies during RC and KC were 133 and 137 beats/min respectively.
- At the beginning of the session, both RC and KC, the babies had either bradycardia or tachycardia.
- In the absence of any disturbance during RC sessions, the LBW babies had both bradycardia or tachycardia.
- In contrast, during KC most of the babies had regular stable heart rate.

(iii) Respiratory rate:
- The mean respiratory rate of LBW babies during RC (58/min) was much lower than during KC (53/min).
- In KC sessions, the babies were found to have regular and deep respiration. As they started to sleep (deep quiet sleep state) comfortably in skin-to-skin contact with their mothers.

(iv) O₂ saturation:
- The mean O₂ saturation of LBW babies during RC (94%) was higher than during KC (93%).
- At the beginning of KC, O₂ saturation was found to be lowered to 80-89% and within a minute, the babies regained their normal O₂ saturation.
- The frequency of episodes of lowered O₂ saturation states, during KC sessions was 5.4 whereas in RC it was 9.5, which is statistically significant (P=0.00).

(v) Apnea:
- The mean apneic spells during KC was lower (0.43) than during RC (0.73) which was not statistically, but clinically significant.

B. Behavioral state:
- Increased “Deep Quiet Sleep” state (69%) was found during KC.
- Majority of babies (78.3%) were found to have improved behavioral state (progress from lower to higher score state) during KC than during RC (54.1%).
- In RC sessions, most of the babies had the active sleep state (44.8%) than deep quiet sleep state (27.3%).
- The mean crying state was found to be less during KC (1.6) than during RC (3.9), which is statistically significant (P=0.00).

C. Mother’s perception about KC:
- About 93% of mothers had a positive attitude towards Kangaroo Care.
- No mother had any negative attitude towards KC.
- About 87% of mothers expressed that they wanted to continue KC in home.
- About 67% of mothers said that KC has improved their lactation.

RECOMMENDATIONS FOR NURSING PRACTICE:
1. A similar study can be done on a larger sample.
2. A study on the effectiveness of Kangaroo Care on the weight gain of LBW babies may be done.
3. “Kangaroo Care” or “Skin-to-Skin Care” is an effective intervention which can be safely included in the management of LBW babies in NICU and in maternity wards. Also after discharge, at home the mothers can continue it.
4. KC can be implemented as an alternative method where adequate resources like incubator are not available for the management of LBW babies and thus ensuring the best possible care for them.
5. Education and demonstration must be provided to each mother of LBW babies and they should be encouraged to practice KC.
6. Education on Kangaroo Care
and its benefits should be organized for nurses, nursing students and primary health care workers.

7. The fitness of LBW babies and mothers should be evaluated before starting KC.

8. Nurses must encourage proper hygiene and hand washing technique and hygienic practices to be followed by the mothers, before starting KC.

CONCLUSION:

The vulnerable tiny low birth babies are at risk to develop much complication right from their birth. All health care professionals are responsible for providing a comprehensive and holistic care and to reduce the mortality and morbidity of these high-risk group babies. Any novel intervention which proves to improve the baby’s physical and behavioural states and their sense of security and not having any adverse effect on their health can be safely introduced in the neonatal care units.

The study has demonstrated that KC is one such intervention for LBW babies. The physiological and behavioral states of LBW babies were found to be improving during Kangaroo Care.

- Also it provided a chance for the mothers to touch, hold, talk and to participate in the care of their babies who are admitted in the NICU and thus reduce the feelings of separation and anxiety.

- Temperature regulation, weight gain and proper brain development are the important concern in the care of LBW babies. This study has proved that Kangaroo Care improved the body temperature of LBW babies and most of the babies went into “Deep Quiet Sleep State”, which actually helps in the brain development of preterm babies.

For a developing country like India where there are only limited resources and inappropriate distribution of health services the intervention like Kangaroo Care can help in reducing the mortality and morbidity of Low Birth Weight babies. This Skin-to-Skin Care should be taught to all levels of health care workers and should be practiced by all mothers of LBW babies. The lives of these high-risk group babies can thus be saved to a greater extent.

REFERENCES:


