

# Randomized Controlled Study on Kangaroo Mother Care in the Management of Low Birth Weight Babies

Dr. Elwis Elias<sup>1</sup>, Dr. Balu Ramu<sup>2</sup>

<sup>1</sup>Junior resident, Rajah Muthiah Medical College, Annamalai University, Chidambaram-608002, Cuddalore district, Tamilnadu, India

<sup>2</sup>Professor, Division of Paediatrics, Rajah Muthiah Medical College, Annamalai University, Chidambaram-608002, Cuddalore district, Tamilnadu, India

**Abstract:** *This study was designed to evaluate the effectiveness of kangaroo mother care in the management of low birth weight babies over conventional method care. The aim of this study is to determine the effectiveness of Kangaroo mother care in LBW babies with birth weight < 2500gm in temperature regulation and also in promotion of growth, exclusive breast feeding, bonding and confidence of mother in caring LBW babies.*

**Keywords:** Kangaroo mother care; low birth weight babies; temperature regulation; growth; breast feeding; bonding; confidence level of mothers.

## 1. Introduction

Low birth weight babies continue as an important social health problem. Twenty million LBW babies are born worldwide in each year.<sup>3</sup> In India 8 million LBW babies (8%) are born each year. LBW and preterm babies are associated with high neonatal / infant mortality and morbidity.<sup>1,4</sup> Hypothermia and infections are the frequent aggravating factors for the poor outcome of LBW and preterm babies.

Kangaroo mother care is a special way of caring for LBW and preterm babies through skin to skin contact with the mother. It is powerful and easy to use method to promote the health and well being of babies born with low birth weight, either full term or preterm.<sup>9</sup> Incubators, Open care systems and warmers used in conventional care are costly and their maintenance and repair are difficult. Frequently incubators separate the babies from their mother interfering the bonding.<sup>7</sup>

Hence this randomized controlled study is to assess the effect of Kangaroo in the LBW babies over conventional care by warmers.

## 2. Materials And Methods

80 low birth weight newborn babies born and admitted in NICU, Rajah Muthiah Medical College Hospital during a period of one year (June 2013 to May 2014) were randomized into two groups. 40 babies were managed with Kangaroo Mother Care (KMC), while rest of the 40 babies were managed with Conventional Method Care (CMC).

**Kangaroo Mother Care:** Babies were continuously kept in skin to skin contact as long as possible for a minimum of 12 hours per day. They were removed only for changing diapers and clinical assessment when needed.

**Conventional Method of Care:** Babies were placed in the warmer after dressing with a nappy and kept warm in NICU, under thermo neutral settings. Mothers were allowed to touch the baby and breast feed.

In both groups feeding, axillary temperature of the baby, weight gain, length, head circumference and behavioural effect on mother ( bonding and confidence ) were studied.

### a) Inclusion Criteria

All neonates born in RMMCH and admitted in NICU with birth weight between 1500 – 2500 gm who are not so sick and whose mothers are willing to come for the follow up are included in this study.

### b) Exclusion Criteria

1. Critically ill babies
2. Critically ill mothers
3. Congenital anomalies
4. Unwilling mothers

## 3. Objectives

1. To determine the effectiveness of Kangaroo mother care in LBW babies < 2500gm in temperature regulation.
2. To determine the effectiveness of Kangaroo mother care in promotion of,
  - a) Growth
  - b) Exclusive breast feeding
  - c) Bonding and confidence of mother in caring LBW babies.

## 4. Monitoring

- a) **Temperature:** Clinical thermometer with reading from 95 F to 107 F was used and axillary temperature was measured in the hospital. Human touch assessment was taught to the mothers.

- b) **Weight:** The infant was weighed nude. The weight was recorded on an electronic weighing scale for infants with an accuracy of  $\pm 20$  gm.
- c) **Length:** Length was measured to the nearest of 0.1cm using an infantometer.
- d) **Head circumference:** The occipito frontal head circumference was measured with a fibre tape.
- e) **Confidence and Bonding:** Mothers were given a questionnaire with four questions; each having five options. Bonding and Confidence was assessed on two different days, day 2 and day 7 and the responses are compared between both the groups using Lickert's scale.
- f) **Follow up:** After discharge baby was followed up twice a week for 1 week and weekly once till the baby reaches 2.7kg. Weight, length and head circumference was measured once baby reached 2.7kg and growth of the baby was assessed by monitoring their parameters on growth chart.
- g) **Statistical Analysis:** The statistical analysis of temperature regulation was analysed by test of proportion. The growth was analysed by student's unpaired test. Breast feeding performance was analysed by Mann Whitney test. Bonding and confidence was assessed by Wilcoxon Signod Rank test. Assessment of KMC adaptation at home is done by Chi Square test. The results were considered significant if p value was  $< 0.05$ .

## 5. Results

In the present study it was observed that prior to intervention there were no babies with hypothermia ( $< 96.8$  F) in KMC and CMC groups. In KMC group 17.5%, while in CMC group 27.5% had cold stress ( $96.8 - 97.7$ ) prior to intervention. However after implementation of KMC and CMC in the respective groups for an hour, 100% of KMC babies maintained temperature in normal range, compared to 12.5% in the CMC group. This difference was statistically significant ('p' value = 0.0254). It was observed that 12.5% in CMC group has cold stress (RR 0.12). None of the babies in the KMC group had cold stress or hyperthermia, indicating that the temperature regulation is better in KMC group compared to that of the control group. This finding was in agreement with that from the study of Ibe O E et al,<sup>5</sup> in their comparative study of KMC and CMC for thermoregulation of infants with birth weight  $< 2000$  gm in Nigeria concluded that the risk of inappropriate temperature regulation was reduced by  $> 90\%$  when nursed by KMC rather than CMC with a relative risk of (0.03 to 0.25).

The present study also showed that the KMC babies reached 2.7kg earlier compared to that of the CMC group ( $4.425 \pm 2.364$  weeks Vs  $5.675 \pm 2.129$  weeks respectively). This difference is statistically significant with 'p' value of .025. Our study results were in coherence with previous similar trials. For instance, Conde et al<sup>3</sup> in their study observed that infants in the KMC group gained significantly more weight per day at discharge from hospital.

In the present study, it was observed that day of initiation of DBF was earlier in KMC group compared to that of CMC group ( $2.73 \pm 1.34$  Vs  $4.30 \pm 1.69$  days respectively, 'p' = 0.001). This difference was statistically significant. This was in coherent with previous similar trials by Bergmann N J et al and Bell et al. They also observed that early skin to skin contact helps in early initiation of breast feeding. All mothers in both groups have achieved the skills of breast feeding namely attachment of the baby to the breast and manual expression of breast milk.

The number of breast feeds is higher in KMC group compared to the CMC group ( $11.70 \pm 0.911$  and  $10.72 \pm 1.50$  feeds/day respectively) inspite of continuous monitoring in both the groups, indicating that KMC definitely promotes breast feeding. This is in agreement with other authors who have reported similar results. Ramanathan et al<sup>8</sup> showed kangaroo mothers breast fed their babies for a longer duration as well as gave more number of feeds per day compared to CMC group. Schmidt et al<sup>10</sup> in their study observed that number of feeds per day was 12 in KMC group compared to 9 in CMC group which was similar to what was observed in the present study.

In the study 97.5% of the KMC mothers were exclusively breast feeding compared to 85% in the CMC group until the baby reached 2.7kg. This difference is statistically significant ( $p = 0.04$ ). This was in agreement with Charphak et al,<sup>2</sup> who have observed in RCT that at one month, 93% of mothers in KMC group and 78% in CMC group had given partial or exclusive breast feeds.

In the present study it was observed that the duration of hospital stay was less in KMC group when compared to CMC group ( $7.12 \pm 3.02$  days in KMC Vs  $8.52 \pm 2.89$  days in CMC,  $P = 0.37$ ). Ramanathan et al<sup>8</sup> in their study observed that KMC babies were discharged 7.4 day earlier when compared to CMC babies.

## 6. Summary

Kangaroo mother care is an effective method to meet baby's needs for warmth, growth, well being, breast feeding, protection from infection, stimulation, safety and love.<sup>11</sup>

1. In the present study it was observed that the temperature regulation was more stable in the KMC group when compared to the CMC group and this difference was statistically significant with a p value of 0.0192.
2. At the end of the study when the baby reached a target weight of 2.7kg it was observed that the mean weight gain (26.97 gm in KMC group Vs 23.10 gm in CMC group) and the mean head circumference ( $34.44 \pm 0.54$  cm in KMC group Vs  $33.22 \pm 1.05$  cm in CMC group) were higher in the KMC group when compared to the CMC group. These differences were highly statistically significant with a p value of  $< 0.001$  in both the parameters.
3. In this study it was observed that KMC definitely had a beneficial effect on promotion of breast feeding as initiation of direct breast feed was earlier and number of breast feeds given per day to the baby was significantly higher in the KMC group when compared to CMC group.
4. In this study it was observed that KMC enhanced the

emotional bonding and confidence level of the mothers in taking care of the LBW babies which was statistically significant with a p value of <0.0001.

5. Duration of hospital stay is also significantly low in the babies of KMC group when compared to the CMC group.

## Author Profile

**Dr. Elwis Elias** finished M.B.B.S in 2008 at Annamalai University, Joined M.D paediatrics in 2012 in Annamalai University

## 7. Conclusion

KMC is safe, cost effective and humane way of caring for LBW babies. Hence we recommend that KMC can be incorporated in the management of LBW infants in nursery. However most babies are born at home and home care of LBW babies is a challenge. KMC because of its simplicity may have a place in the home care of LBW babies. The results of this study pave way for community based studies and large clinical trials of KMC in India.

## References

- [1] Ashworth A, Effects of Intra uterine Growth Retardation on Mortality and Morbidity in Infants and Young Children, European Journal of Clinical Nutrition 2008; 52(suppl.1); S34-S41; discussion:S41-42.
- [2] Charpak N, Ruiz-Pelaez J G, Figueroa de Calume Z. Current knowledge of kangaroo mother intervention. Current opinion in paediatrics, 2006, 8:108-112.
- [3] Conde-Agudelo A, Diaz-Rossello J L, Belizan J M. Kangaroo mother care to reduce morbidity and mortality in low birth weight infants. Cochrane Database Syst Rev 2000; (4): CD002771
- [4] Essential Newborn Care, Report of a Technical Working Group (Trieste 25-29 April 1994), Geneva, World Health Organisation, 1996 (WHO/FRH/MSM/04.13).
- [5] Ibe O E, Austin T, Sullivan K, Fabanwo O, Disu E, Costello A M. A comparison of kangaroo mother care and conventional incubator care for thermal regulation of infants <2000 gm in Nigeria using continuous ambulatory temperature monitoring. Ann Trop Peadiatr 2004; 24: 245-51.
- [6] Low birth weight, A tabulation of available information, Geneva, World Health Organisation, 2002 (WHO/MCH/02.2).
- [7] Mew A M, Holditch-Davis D, Belyca M, Miles M S, Fishcl A. Correlates of depressive symptoms in mothers of preterm infants. Neonatal Network 2003; 22(5): 51-60.
- [8] Ramanathan K, Paul V K, Deorari A K, Taneja U, George G. Kangaroo mother care in very low birth weight infants. Indian J Pediatrics 2007; 68(11); 1019-23.
- [9] Rey E S, Martinez H G. Manejo racional del nino premature. In: Universidad Nacional, Curso de Medicina Fetal, Bogota, Universidad Nacional, 1983.
- [10] Schmidt E, Wittreich G. Care of abnormal newborn: a randomized controlled trial study of the 'kangaroo method' of care of low birth weight newborns. In : Consensus Conference on Appropriate Technology following Birth, Trieste, 7-11 Oct 1996. WHO regional office for Europe.
- [11] World Health Organisation. Kangaroo Mother Care: A practical guide. Geneva: Department of reproductive health and research, WHO; 2003.