

Effect of Kangaroo Mother Care (KMC) on Physiology of Low Birth Weight Infants in Udupi District

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Abstract

A study was conducted to determine the feasibility and acceptability of kangaroo care in a tertiary care hospital in India. A randomised controlled trial was performed over one-year period in which 89 neonates were randomised into two groups, kangaroo mother care (KMC) and conventional method of care (CMC). Forty-four babies were randomised into KMC group and 45 to CMC. There was significant reduction in KMC vs CMC group of hypothermia (10/44 vs 21/45, $p < 0.01$), higher oxygen saturations (95.7 vs 94.8%, $p < 0.01$) and decrease in respiratory rates (36.2 vs 40.7, $p < 0.01$).

Globally, more than 20 million infants are born with low birth weight (LBW). 72 percent of LBW infants in developing countries are born in Asia. The number of LBW infants are concentrated in two regions of the developing world, India and Africa. Kangaroo Mother Care (KMC) is a health care strategy and method for infants under 2000 gm at birth, created and developed by a team of paediatricians at the Instituto Materno Infantil in Bogota, Colombia in 1978. KMC is presently promoted in both hospital and community settings. It has been formally endorsed by WHO, which published a set of KMC practice guidelines in 2003.

Despite sound evidence about the effectiveness and safety of KMC, many leaders in newborn care have never been exposed to the science/art of KMC. Paediatricians and nurses may have heard about KMC, but have no first-hand experience and thus feel unsure about initiating and sustaining KMC programme in their neonatal units. The method was evolved as an accepted way of dealing with inadequate and insufficient incubators to care for LBW infants whose only medical problem relates to being underweight.

Material & Methods

Non-randomised pre-test post-test with control group design was used for this study. Sample of the study included 60 LBW infants from 7-28 days of birth, and their mothers. The inclusion criteria were: mothers who delivered LBW Infants, who were able to provide KMC. Institutional ethical committee clearance was obtained from Kasturba Hospital, Manipal. Mothers were explained about the study and written consent

obtained from the mothers. The data collection instruments used for the study were: Tool I -Base line proforma of the mother, Tool II - Base line proforma of an infant; and Tool III - Format to assess the physiological parameters of an infant.

The tools were validated by the subject experts. The inter-rater reliability of the equipment (Multi channel Philips monitor) was obtained and found reliable (electronic thermometer $r = 0.96$, heart rate: $r = 0.98$, oxygen saturation: $r = 0.98$ and weighing machine: $r = 1.0$). The pilot study was conducted between 7 to 18 December 2007, and the study was found feasible.

The data for the main study was collected from 19 December 2007 to 26 February 2008 on 60 mothers and their LBW infants (30 each in experimental and control group). Maternal and infants' characteristics as well as physiological parameters were collected from both the groups and were recorded. The experimental group received KMC, by using KMC dress, whereas control group received routine care as per the hospital policy.

Results

Data were analysed by using SPSS version 10.5. Table 1 shows that majority of the mothers were aged between 26-30 years (60% in experimental and 47% in control group). Most of the mothers' mode of delivery was LSCS (87% in experimental and 80% in control group). Maximum number of mothers were primi gravid (64% in experimental and 73% in control group). Most of the mothers antenatal complications were PIH (70% in experimental and 73% were in control group). Majority of the mothers were educated upto higher secondary (56% in experimental and 63% in control group), and most of the mothers were from

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Table 1: Sample characteristics of mothers

n=60 (30+30)

Sample characteristics	Experimental group		Control group	
	Frequency	%age	Frequency	%age
Age in years				
< 20	1	3	1	3
21-25	8	27	10	33
26-30	18	60	14	47
31-35	3	10	4	14
> 35	0	0	1	3
Mode of delivery				
Normal	4	13	6	20
LSCS	26	87	24	80
Gravida				
Primi	19	64	22	73
Gravida 2	7	23	6	20
Gravid 3 & >3	4	13	2	7
Antenatal complication				
PIH	21	70	22	73
APH	6	20	4	13
Others	3	10	4	13
Education				
Illiterate	0	0	1	3
Primary	5	17	5	17
Higher Sec	17	56	19	63
PUC	5	17	3	10
Graduate	3	10	2	7
Religion				
Hindu	26	86	24	82
Christian	2	7	3	9
Muslim	2	7	3	9

Table 2: Sample characteristics of infants

n=60 (30+30)

Sample characteristics	Experimental group		Control group	
	Frequency	%age	Frequency	%age
Sex of infant				
Male	21	70	19	63
Female	9	30	11	37
Age of infant				
Day 7	20	67	20	67
Day 8-14	9	30	8	26
Day > 14	1	3	2	7
Weight of infant				
< 1000 gm	5	17	1	3
1000-1499 gm	16	53	19	63
1500-1999 gm	9	30	10	34
Length of infant				
< 40 cm	7	23	7	23
40 - 44 cm	22	74	22	74
> 45 cm	1	3	1	3
HC of infant				
< 30 cm	21	70	19	63
30-32 cm	9	30	11	37
Gestational age (in weeks)				
1-30	6	20	5	17
23-24	14	47	16	53
> 34	10	33	9	30
APGAR at 1 min				
< 5	1	3	0	0
5-7	8	27	4	13
7-10	21	70	26	87

Hindu religion (86% in experimental and 82% in control group).

Table 2 shows that majority of infants (70% in experimental and 63% in control group) were males. Equal number (84% in experimental and control group each) were included in the study on seventh day. With regard to the weight, majority of the infants' weighed between 1000-1500 gm in both groups (73% subjects in experimental and 63% in control group). Most of the infants' length was between 40-44 cm (56% in experimental and 73% subjects in control group). Head circumference of maximum number of subjects was < 30 cm (70% in experimental and 63% in control group) and majority of the subjects' gestational age was between 30-34 weeks (46% in experimental and 53% in control group). Majority of the infants' APGAR score recorded at birth within one minute was 7-10 (70% in experimental and 66% sub-

jects were in control group).

The data presented in Table 3 shows that the mean post-test value of temperature, heart rate and oxygen saturation in the experimental group was higher than the mean in the control group, and mean weight gain (after seven days of intervention) in the experimental group higher than the mean in

Table 3: Effectiveness of KMC on physiological parameters

Physiological parameters	Group	Mean		SD		df	t' value
		Pre-test	Post-test	Pre-test	Post-test		
Temperature	Exp	97.87	99.01	0.17	0.13	29	28.85
	Control	97.99	97.75	0.07	27	29	4.11
Heart rate	Exp	139.19	137.30	7.90	7.83	29	9.58
	Control	136.73	136.34	4.79	5.49	29	1.29
Respiratory rate	Exp	59.06	57.51	2.55	2.60	29	12.18
	Control	59.25	59.03	2.07	2.23	29	1.25
Oxygen saturation	Exp	93.87	94.97	0.43	0.79	29	11.05
	Control	93.99	94.00	0.81	1.12	29	1.55
Weight	Exp	13.97	—	4.35	—	58	5.18
	Control	9.09	—	2.75	—	58	5.18

Table value $t_{(29)}=2.04$, $p<0.001$ Table value $t_{(58)}$, 3.46, $p<0.001$

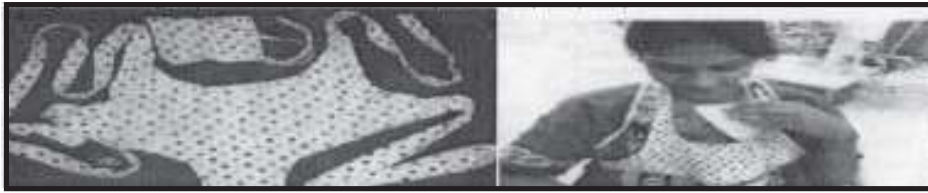


Fig. 1: Kangaroo Mother Care dress prepared by the investigator

the control group. There was significance difference in the 't' value of temperature, heart rate, respiratory rate, oxygen saturation and weight gain. Between the experimental and control group there was significant increase in temperature of infants who received KMC, there was no improvement oxygen saturation and weight gain as expected. Thus the study findings bring out that KMC was as effective as routine care.

Discussion

The study shows that KMC was effective in maintaining physiological parameters of LBW infants; it helped to prevent hypothermia, apnoea/tachypnea, bradycardia/tachycardia and improving the oxygen saturation and weight gain. The finding of this study was consistent with the study conducted in Lokmanya Municipal Medical College and General Hospital, Sion, Mumbai to determine the fea-

sibility and acceptability of kangaroo care. There was significant reduction in hypothermia, higher oxygen saturations and decrease in respiratory rates. A relevant study was conducted to evaluate the effect of KMC on selected physiological states of LBW infants in a hospital of Kolkata, and showed that post-KMC mean scores of body temperature and oxygen saturation were statistically significant on three consecutive days. These studies support findings of the present study.

References

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Election Results: TNAI Tamil Nadu State Branch - 2011

The elections of TNAI Tamil Nadu State Branch were held at Baline Auditorium, Sri K. Ramachandran Naidu College of Nursing, Tirunelveli on September 23, 2011. The following Office Bearers were declared elected: **President:** Prof (Mrs) Jaeny Kemp, Principal, GKNM Institute of Nursing, Coimbatore-641037. **Vice President:** Dr (Mrs) S Vijayalakshmi, Principal, Vignesh Nursing College, Kizhanaikarai Manalurpet Road, Tiruvannamalai-606603, Tiruvannamalai Distt. **Secretary:** Mrs Chellammal Mariappan, KKR Doctors Court, 131, Madhavaram High Road North, Perambur, Chennai-600011. **Treasurer:** Prof (Mrs) Ani Grace Kalaimathi, Principal, MIOT College of Nursing, No. 1/70, Mariamman Koil Street, Mugalivakkam, Chennai-116. **SNA Advisor:** Dr Jeyaseelan M Devadason, Dean, Annai JKK Sampoorani Ammal College of Nursing, Valayakaranur PO, Komarapalayam-638 138, Namakkal Distt. **Chairperson, Nursing Research:** Dr (Mrs) Latha Venkatesan, Principal, Apollo College of Nursing, Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai-600095. **Chairperson, Nursing Education:** Dr (Mrs) G Josephine R Little Flower, Registrar, Tamil Nadu Nurses and Midwives Council, Jayaprakash Narayanan Maligai, Old No. 140, New 56, Santhome High Road (Nnear Santhome Church), Mylapore, Chennai-600004. **Chairperson, Nursing Service:** Mrs AF Anni Raja, Principal, Andhra Mahila Sabha School of Nursing, No. 11, Durgabai Deshmukh Road, Raja Annamalai Puram, Chennai-600028. **Chairperson, Social Welfare:** Prof (Mrs) Santhi Appavu, Principal, Christian College of Nursing, Kanyakumari CSI Diocese, Neyyoor, Kanyakumari Distt. 629 802. **Chairperson, Public Health Section:** Dr.(Mr.) D. Manivannan, Principal, Padamasri Dr Sivanthi Adhithanar College of Nursing, Tirunelveli Road, Tiruchendur-628 215, Thoothukudi Distt. **Chairperson, Programme Committee:** Prof (Ms) P Muthulakshmi, Principal, PPG College of Nursing, 9/1, Keeranatham Road, Saravanampatty, Coimbatore-641 035. **Chairperson, Membership Committee:** Prof (Mrs) R Revathi, Professor, Sri Ramachandra College of Nursing, No. 1, Ramachandra Nagar, Porur, Chennai-600 116. **Representative of HVL / Midwives / ANM:** Dr (Mrs) T Komalavalli, Principal, Karpaga Vinayaga College of Nursing, Palayanur (via), Padalamn, Kancheepuram Distt.603308.

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