

## Original Research Article

DOI: <http://dx.doi.org/10.18203/2349-3291.ijcp20192019>

# The evaluation of effectiveness of separate kangaroo mother care ward on implementation of kangaroo mother care in tertiary care hospital: a before and after study

Bhowmik A.<sup>1</sup>, Gayen G.<sup>1\*</sup>, Nandy M.<sup>2</sup>

<sup>1</sup>Department of Neonatology (Pediatrics), <sup>2</sup>Department of Pediatrics, Medical College, Kolkata, West Bengal, India

**Received:** 15 February 2019

**Accepted:** 08 March 2019

**\*Correspondence:**

Dr. Gayen G.,

E-mail: dr.gargi07@gmail.com

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** Kangaroo mother care (KMC) is a standard of care for preterm and low birth weight babies. To implement KMC in institutional care it was often practiced inside intensive care unit and also in separate ward. In present study authors have tried to evaluate effect of separate kangaroo mother care ward on implementation of kangaroo mother care in tertiary care hospital.

**Methods:** Uncontrolled study before and after establishment of separate kangaroo mother care ward comparing kangaroo mother care in sick new-born care unit versus kangaroo mother care in separate ward.

**Results:** In separate ward, as compared to kangaroo mother care practice in sick newborn care unit, mean (SD) duration of kangaroo mother care increased from 5.3 (1.6) to 11.4 (7.4) hours/day (95% CI 5.0-7.1, p value <0.0001). Mean (SD) weight gain increased from 10.7 (7.0) g/day to 13.7 (11.1) g/day (95% CI 1.0-4.8, p value <0.0024). Incidence of sepsis diminished from 14.0% to 28.9% (95% CI 6.4-23, p value <0.0006). Exclusive breast-feeding rate at discharge (42.3% vs. 57.3%) (95% CI 4.8- 24.9, p value <0.0041) and follow up (49.4% vs. 65.0%) (95% CI 1-29.4, p value <0.0378) increased. Mortality also decreased in this group of patients (8.6% vs.2.3%) (95% CI-1.6-11.4, p value <0.0082).

**Conclusions:** Kangaroo mother care ward is better place than sick new born care unit for providing kangaroo mother care in tertiary care hospital.

**Keywords:** Kangaroo mother care, Separate KMC ward, Sick new-born care unit

## INTRODUCTION

Globally, 2.6 million children died in the first month of life in 2016.<sup>1</sup> India carries the highest number of neonatal mortality in world.<sup>2</sup> Prematurity and low birth weight (LBW) are the most important causes of neonatal mortality in India.<sup>1,2</sup> Kangaroo mother care (KMC), which was first introduced years back in Bogota, Columbia, is a low cost effective and evidence based intervention for care of preterm and LBW babies.<sup>3,4</sup> KMC

is an important strategic intervention for institutional care of LBW babies in India newborn action plan (INAP).<sup>5</sup> To scale up institute based KMC, Government of India recommended for establishment of separate ward for KMC care.<sup>6</sup> As part of this recommendation a separate ward was established in our tertiary care hospital. In this study authors try to identify whether KMC ward is better for effective KMC implementation than previous practice of KMC in neonatal intensive care unit (NICU)/sick newborn care unit (SNCU).

## METHODS

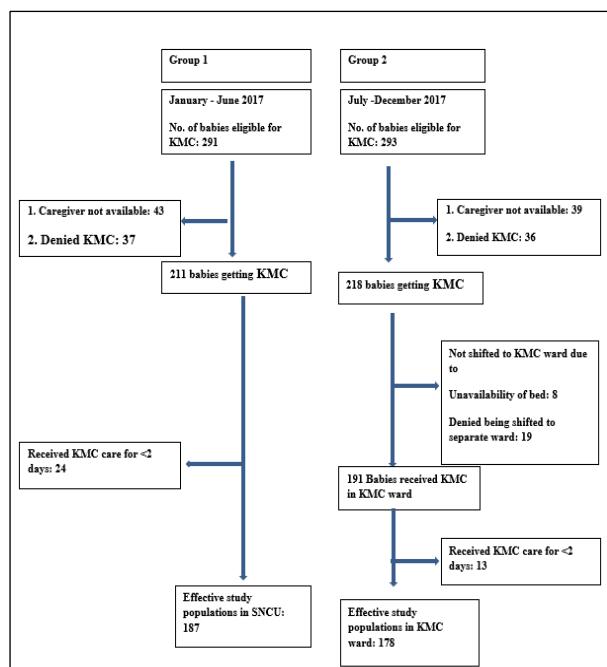
An uncontrolled before and after study was conducted in Medical College, Kolkata, West Bengal India a tertiary care hospital in eastern India. Approval was obtained from institution's ethics committee.

A separate ward dedicated for KMC was established on July 2017. Before its establishment, KMC was practiced in NICU/SNCU in semi reclining chair. Mothers used to stay in separate room and were allowed to come to SNCU for KMC at a regular interval. In NICU/SNCU, there was 1 nursing staff for 12 babies in each shift for looking after all sick babies in different levels of support in addition to babies getting KMC only. Inside NICU/SNCU there was printed IEC, but no entertainment facility. Moreover, there was a stressful environment with lots of alarms and active interventions. In KMC ward, there was 1 nursing staff in each shift for taking care of 15 LBW babies, who were not "otherwise" sick. Here, mothers and babies were allowed to stay together for 24 hours per day in bed with back rest. Except for the KMC time, babies were kept in mothers' bed in nesting made of clothes. One television was there for information and entertainment purpose. Apparel used, maintenance of asepsis, frequency of monitoring, expression support was same in both places as per standard guideline.

Babies getting KMC in SNCU/NICU from January to June 1017 were included in group 1 and those who were in KMC ward from July to December 2017 were in group 2. In each group only those babies were included in the study who were not otherwise ill and free of oxygen and IV fluid requiring only LBW care. Babies >1500 gram at the initiation of KMC and with major congenital anomalies were excluded from the study. Babies receiving KMC care for <2 days were not considered in study analysis. All baby fulfilling inclusion criteria in study period were included in study. No prior sample size calculation was done.

After proper instruction for KMC, it was initiated immediately and supervised and documented by staff-nurse throughout the procedure in a standardized format. In first epoch KMC was continued in SNCU till discharge. In second epoch, if bed was available, they were shifted immediately and KMC was initiated in KMC ward only. If bed was unavailable, they continued KMC in NICU/SNCU and shifted to KMC ward whenever bed was available. The KMC done in NICU/SNCU for these babies before shifting to KMC ward was not taken into account for study. Rests who continued doing KMC in SNCU/NICU and whose mothers denied being shifted was excluded from present study (Figure 1).

Data was collected during hospital stay, and at 15 days follow up visit from those who turned up.



**Figure 1: Study flow chart.**

For babies who had to discontinue KMC due to sickness of baby or mother, data were collected at KMC termination and ultimate outcome at the end of hospital stay.

## RESULTS

There were 187 babies in group 1, and 178 babies in group 2, after all exclusion. Their demographic profiles and co-morbidities before initiation of KMC were similar (Table 1).

KMC was initiated earlier in group 1 than group 2 (mean (SD) 12.8 (6.2) vs. 15.2 (9.6) days) and mean (SD) duration of stay was less in group 1(7.4 (4.7) vs. 9.8 (6.5) days).

On the other hand, mean duration of KMC care is much higher in group 2 (11.4 hours/day) as compared to group 1 (5.3 hours/day). In group 2 there is better weight gain (mean difference 2.9), higher exclusive breast-feeding rate at discharge (57.3% vs. 42.3%) and follow up (65.0% vs. 49.4 %), much lower incidence of sepsis (14.0 vs. 28.9%) and lower mortality (2.3% vs. 8.6%). All these results were statistically significant with p value <0.05 (Table 2).

Follow up rate was very low in both group (group 1- 46.2% and group 2-55.7%). Among follow up babies, 26.6% in group 1 and 35.1% in group 2 continued KMC at home. Although both results were little better in group 2 these were not statistically significant

**Table 1: Maternal and babies' demographic details, p value <0.05 was considered as significant.**

	SNCU n = 187	KMC ward n = 178	P value
Maternal age (years) (mean (SD))	22.7 (3.1)	23.2 (3.3)	0.1352
Type of delivery (n (%))	NVD 108 (57.8)	98 (55.0)	0.6049
	Assisted VD 28 (15.0)	23 (12.9)	0.5728
	LUCS 51 (27.3)	57 (32.0)	0.3210
Type of admission (n (%))	Inborn 105 (56.2)	111 (62.4)	0.2282
	Our born 82 (43.9)	67 (37.6)	0.2282
	RDS 58 (31.0)	67 (37.6)	0.1827
Co-morbidities before KMC initiation (n (%))	Birth asphyxia 37 (19.8)	35 (19.7)	0.9771
	Sepsis 86 (46.0)	83 (46.6)	0.9011
	Jaundice 60 (32.1)	61 (34.3)	0.6573
Gestation (completed weeks) (median (IQ))	32 (3.5)	32 (3)	
Birth weight (g) (mean (SD))	1308.4 (171.5)	1310.6 (186.2)	0.9082

**Table 2: KMC details, p value <0.05 was considered as significant.**

	SNCU n = 187	KMC ward n = 178	P value
Post-natal day of KMC initiation	12.8(6.2)	15.2(9.6)	0.0046
No. of days KMC given (mean (SD))	7.4 (4.7)	9.8 (6.5)	0.0001
Time of KMC (hours/day) (mean (SD))	5.3 (1.6)	11.4 (7.4)	<0.0001
Weight gain (gm/day) (mean (SD))	10.7(6.9)	13.7 (11.1)	0.0024
New onset sepsis during KMC (n (%))	54 (28.9)	25 (14.0)	0.0006
Exclusive breastfeeding at discharge (n (%))	79 (42.3)	102 (57.3)	0.0041
Mortality rate (n (%))	16 (8.6)	4 (2.3)	0.0082
Follow up (n (%))	Follow up done among living 79 (46.2)	97 (55.8)	0.0768
	KMC continuation at home 21 (26.6)	34 (35.1)	0.2292
	Exclusive breastfeeding status on follow up 39 (49.4)	63 (65.0)	0.0378

## DISCUSSION

Previous studies done in NICU/SNCU have demonstrated that KMC is better than conventional care for low birth weight babies.<sup>7,8</sup> In few studies, KMC care in KMC ward was compared with conventional care in NICU/SNCU.<sup>9,10</sup> But so far no study have described the picture of KMC in two different places i.e. NICU/SNCU vs. KMC ward.

In present study initiation of KMC was earlier in SNCU as compared to KMC ward. It might be a reflection of better confidence of health care providers and mothers to stay in NICU/SNCU in earlier days when babies are smaller and more labile. Delay in shifting of mothers from one ward to another could also be a contributing factor. Mean duration of stay in KMC ward was higher than NICU/SNCU. It might be due to overcrowding in SNCU which didn't allow the LBW babies for longer stay. It was also possible that mothers were willing to stay in KMC ward longer duration because of better comfort level.

Significantly greater duration of KMC was possible in KMC ward as here mothers and babies were kept together for 24 hours. Mothers were enabled to give longer duration of KMC because of less stress in this ward as compared to NICU/SNCU, where there was lots of sick babies and gadgets with different types of alarms and visible active interventions on other sick babies.<sup>11</sup> Reinforcement of KMC care was better in KMC ward as nurses were more involved with KMC care as they were not burdened with other work and mothers were getting a companion of peer group benefitted with the same.

Because of continuous staying together, less stress and better support exclusive breast-feeding rate was high at per with previous study.<sup>12</sup> Longer duration of KMC and better breast-feeding rate lead to better weight gain and less incidence of sepsis. Sepsis incidence was low also because of less chances of cross infection. These advantages of KMC ward were also reflected by a lower mortality rate. These results further strengthened the fact that separate KMC ward is an enabler of KMC in health facility.<sup>13</sup>

Although follow up rate and rate of KMC continuation at home was little higher after discharge from KMC ward it was still very low. Urgent intervention for strengthening of follow up service is needed for better outcome.

Limitation of this study was to before and after study and seasonal variation may influence study results as samples were taken from different time period. Separate KMC ward establishment lead to more awareness and enthusiasm in health care providers for KMC. It may also influence for the better result in 2<sup>nd</sup> group. Earlier initiation of KMC in SNCU may be a reflection of delay in transfer of the baby for different reason.

## CONCLUSION

To provide intensive and effective KMC, a separate ward is very much helpful.

## ACKNOWLEDGEMENTS

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. UNICEF Data: Monitoring the situation of children and women. Accessed at: <https://data.unicef.org/topic/child-survival/neonatal-mortality/>. Accessed on: 2018 Feb 22.
2. Sankar MJ, Neogi SB, Sharma J, Chauhan M, Srivastava R, Prabhakar PK, et al. State of newborn health in India. *J Perinatol.* 2016;36(s3):S3.
3. Charpak N, Ruiz-Pelaez JG, Charpak Y. Reymartinez kangaroo mother program: an alternative way of caring for low birth weight infants? One year mortality in a two cohort study. *Pediatr.* 1994;94(6):804-10.
4. Conde-Agudelo A, Diaz-Rosello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. *Cochrane Database Systemat Reviews.* 2016(8).
5. Indian Newborn Action Plan, Ministry of Health and Family Welfare, Government of India. Available at: [http://www.newbornwhocc.org/INAP\\_Final.pdf](http://www.newbornwhocc.org/INAP_Final.pdf). Accessed 22 February 2018.
6. National Health Mission. Kangaroo mother care and optimal feeding of low birth weight infants- operational guidelines. National Health Mission. 2014. Accessed at: [http://www.nrhmorissa.gov.in/writereaddata/Upload/Documents/Operational\\_Guidelines-KMC\\_&\\_Optimal\\_feeding\\_of\\_Low\\_Birth\\_Weight\\_Infants.pdf](http://www.nrhmorissa.gov.in/writereaddata/Upload/Documents/Operational_Guidelines-KMC_&_Optimal_feeding_of_Low_Birth_Weight_Infants.pdf).
7. Samra NM, El Tawel A, Cadwell K. Effect of intermittent kangaroo mother care on weight gain of low birth weight neonates with delayed weight gain. *J Perinat Educ.* 2013;22(4):194.
8. Rao SPN, Udani R, Nanavati R. Kangaroo mother care for low birth weight infants: a randomized controlled trial. *Indian pediatr.* 2008;45(1):17.
9. Sharma D, Murki S, Pratap OT. The effect of kangaroo ward care in comparison with "intermediate intensive care" on the growth velocity in preterm infant with birth weight <1100 gram: randomized control trial. *Europ J Pediat.* 2016;175(10):1317-24.
10. Ghavane S, Murki S, Subramanian S, Gaddam P, Kandraju H, Thumalla S. Kangaroo mother care in kangaroo ward for improving the growth and breastfeeding outcomes when reaching term gestational age in very low birth weight infants. *Acta Paediat.* 2012;101(12):e545-9.
11. Rai P, Rani U. Effect of newborn's admission to intensive care unit on "quality of life" of mother: an Indian perspective. *J Mat Fet Neonat Med.* 2018;1-6.
12. Maastrup R, Hansen BM, Kronborg H, Bojesen SN, Hallum K, Frandsen A, et al. Breastfeeding progression in preterm infants is influenced by factors in infants, mothers and clinical practice: the results of a national cohort study with high breastfeeding initiation rates. *PloS One.* 2014;9(9):e108208.
13. Chan G, Bergelson I, Smith ER, Skotnes T, Wall S. Barriers and enablers of kangaroo mother care implementation from a health systems perspective: a systematic review. *Health policy and planning.* 2017;32(10):1466-75.

**Cite this article as:** Bhowmik A, Gayen G, Nandy M. The evaluation of effectiveness of separate kangaroo mother care ward on implementation of kangaroo mother care in tertiary care hospital: a before and after study. *Int J Contemp Pediatr* 2019;6:1239-42.