## **Original Research Article**

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# Does kangaroo mother care have an impact on morbidity, mortality and duration of hospital stay of newly born low birth weight babies?

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#### **ABSTRACT**

**Background:** Preterm and low birth weight infants are more likely to experience neonatal morbidity including acute respiratory, gastrointestinal, central nervous system, immunologic, hearing and vision problems than both term and normal weight infants who survive the neonatal period. The present study was aimed to evaluate the impact of Kangaroo Mother Care (KMC) on morbidity and mortality of new-borns and duration of hospital stay.

**Methods:** A prospective case control study over a 12 month period was conducted from August 2013 to August 2014 on 50 new-borns weighing less than 1.8 kg. The primary outcome variable was "weight gain". Secondary measures included morbidity, mortality and duration of hospitalization. Observations were recorded in a proforma specially designed for the study. The results were subjected to statistical analysis.

**Results:** The hospital stay was less amongst neonates who received KMC. Twenty four (48%) out of 50 were discharged within 10 days, another 24 within 11 to 20 days. Neonates who did not received KMC, majority i.e. 27 of the neonates were in the ICU for 11-20 days. There were 3 neonates who stayed beyond 1 month.

**Conclusions:** The study showed that KMC is useful method of caring VLBW baby in respect of early weight gain and decrease morbidity, mortality and hospital stay in our set up. However, there are still insufficient evidences to recommend its routine use in VLBW babies in our country. Well-designed large randomized controlled trail of this intervention are needed.

**Keywords:** Kangaroo mother care, Low birth weight infants, Preterm

#### **INTRODUCTION**

Kangaroo Mother Care (KMC), first suggested by Dr Edgar Rey in 1978 as a way of compensating resource scarcity in hospitals caring for low birth weight infants.<sup>1,2</sup> Preterm and low birth weight infants are more likely to experience neonatal morbidities including acute respiratory, gastrointestinal, central nervous system, immunologic, hearing and vision problems than both term and normal weight infants who survive the neonatal period.<sup>3</sup>

KMC is an evidence-based technology proposed as an "alternate care for LBW infants" which might be

employed to ameliorate the effect of LBW on mortality and morbidity.<sup>4</sup> Apart from increasing weight of the newborns, it also reduces the risk of hypothermia, nosocomial infection, severe illness and length of hospital stay and increases breastfeeding and emotional bonding between mother and baby.<sup>5</sup> The present study was aimed to evaluate the impact of KMC on morbidity and mortality of new-borns and duration of hospital stay.

#### **METHODS**

A prospective case control study over a 12 month period was conducted from August 2013 to August 2014 on 50 new-borns weighing less than 1.8 kg. An equal number of

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new-borns from the same setting, matched for weight and gestational age received routine care (warmer), and acted as controls. Special bag or kangaroo pouch was designed to keep the baby in close contact with mother in order to provide KMC. The primary outcome variable was "weight gain". Secondary measures included morbidity, mortality and duration of hospitalization. Observations were recorded in a proforma specially designed for the study. The results were subjected to statistical analysis.

Following were included in the study: All newborns less than 1.8 kg, babies who were otherwise healthy or had recovered from their illness, Low birth weight babies on enteral feeds and mother gave their consent. Newborns having weight >1800 gm, sick unstable newborns, newborn needing ventilator care, newborn with major congenital malformation were excluded from the study.

Minimum duration of stay in each group was 6 days from the inclusion in the study, if a case or control got discharged or left against medical advice before 6 days they were excluded from the study. Minimum 6 hours of KMC was mandatory in KMC group. If mother failed to do so then they were excluded from the study. At any time if a mother did not want to continue, they were excluded from the study.

In both groups, birth weight and weight at admission to KMC were noted. Weight of the baby was recorded on electronic weighing machine with accuracy of 5 gms. Weight was taken after removing all of the baby's clothes (i.e. naked baby weight) and at least 2 hrs after the last feed. When the baby was included in the KMC group or control group he/she was observed daily. Weight, temperature and complete clinical examination was done in a minimum time in order to prevent hypothermia. Duration of SSC (skin-to-skin contact) (in hours/day), mother holding the baby in Kangaroo position was noted down. Minimum 6 hrs/day KMC was provided to the baby. If any problem was detected during the course of KMC, either it was rectified or baby was excluded from the study.

Statistical analysis was done using, mean, standard deviation, error of difference between two means and Student paired 't' test to test the significance (p value) between the two groups.

#### **RESULTS**

Maximum number of cases and control were 1-10 days old when included in the study. Maximum number of cases and controls were babies between 1.251 to 1.800 kg

i.e. 70% and 72% respectively. While in between 1 to 1.250 kg, the cases and control were 26% and 28% respectively. In KMC group, 52% of weight gain was in between 100-200gm, while in control group 52% of weight gain was in between 0-100 gm.

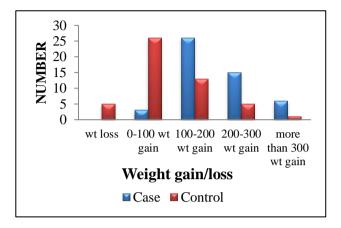


Figure 1: Distribution according to weight gain/loss (in grams).

The pre-intervention mean temperature in neonates of case group was  $35.99\pm0.59$  °F, while the post-intervention mean temperature in case group neonates was  $37.01\pm0.22$  °F. Students paired 't' test was applied to know the change (gain/loss) in temperature within the group. The 't' value obtained within the case group was 14.68, with p value of 0.0001, which is highly significant. Thus, the neonates in the case group had gained temperature after the intervention.

Maximum number of babies in KMC group (52%) gained 15.1-20gm/day v/s 0-5 gm/day in controls (42%). The hospital stay was less amongst neonates who received Kangaroo Mother Care. 24 (48%) out of 50 were discharged within 10 days, another 24 within 11 to 20 days. Neonates who did not received KMC, majority i.e. 27 of the neonates were in the ICU for 11-20 days. There were 3 neonates who stayed beyond 1 month.

The hospital stay was less amongst neonates who received Kangaroo Mother Care, 24 (48%) out of 50 were discharged within 10 days, another 24 within 11 to 20 days. Neonates who did not received KMC, majority i.e. 27 of the neonates were in the ICU for 11-20 days. There were 3 neonates who stayed beyond 1 month.

Thus, there was significant difference in duration of hospital stay between both the case and control groups. The hospital stay of neonates receiving KMC was shorter as compared to neonates receiving routine care.

Table 1: Comparison of duration of hospital stay in both the case and control groups.

	Control group	Case group	t value	P value	
Hospital Stay (days)	17.00±8.09	11.50±3.87	4.33	0.0001	

Data is expressed as mean and standard deviation.

#### **DISCUSSION**

Low birth weight (LBW)/preterm babies are associated with high neonatal/infant mortality and morbidity. Of the estimated 4 million neonatal deaths, LBW/preterm infants accounts for more than 33%, hypothermia and infections are frequent aggravating factors for poor outcome of premature / LBW babies.<sup>6</sup>

In this study, KMC group 52% of weight gain was in between 100-200 gm, while in control group 52% of weight gain was in between 0-100 gm. Babies in KMC has a better average weight gain per day as compared to the control group. With Kangaroo Mother Care, there is decrease in duration of stay in the hospital because of good weight gain, early initiation of breast-feeding and proper temperature regulation. Along with it there is decrease in chance of infection.

In our study, babies in KMC group were discharged earlier than the controls (11.50±3.87 days vs 17.00±8.09 days) with p value < 0.05, which is similar to Cattaneo et al. 7 KMC babies were discharged earlier (13.4 vs 16.4 days) after enrollment. Kambarami et al reported shorter hospital stay (16.6 vs. 20.7). Deorari et al also reported similar results (27.2±7 days vs 34.6±7 days; p<0.05). There was no death in KMC group. This may be due to the selection of only stable babies.

#### CONCLUSION

The study showed that KMC is useful method of caring VLBW baby in respect of early weight gain and decrease morbidity, mortality and hospital stay in our set up. Other advantages of this technique are low cost, promotes exclusive breast feeding practice and increases mother's confidence in handling small babies and builds good mother and infant bonding. However, there are still insufficient evidences to recommend its routine use in VLBW babies in our country. Well-designed large randomized controlled trail of this intervention are needed.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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