

Original Research Article

Emphasise the role of kangaroo mother care in stabilisation of vitals and weight gain pattern in low birth weight babies inside neonatal intensive care unit

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ABSTRACT

Background: Kangaroo mother care (KMC) is routinely practiced in post-natal wards for care of stable low birth weight (LBW) infants. Objectives of the study were conducted to emphasize on the role of KMC in vitals stabilization and weight gain in LBW babies inside neonatal intensive care unit (NICU).

Methods: Cross-sectional analytical quantitative study.

Results: A total of 80 babies (48 males and 32 females) were enrolled and given KMC inside NICU. Mean birth weight was 1330 grams. Mean gestational age was 33 weeks (range 30-38 weeks). KMC was initiated within 72 hours of life in majority of babies (71%). Though 65% of them required oxygen support via prongs, KMC was started in them, with monitoring of vitals. No episode of apnea was observed during KMC sessions. Mean duration of KMC was 6 days (3-14 days). Heart rate dropped by 3-4 beats per minute (150+2.12 to 146+1.63, Respiratory rate decreased from 53+3.9 to 49+2.7, Oxygen saturation improved by 2-3% (93+0.42 to 96+0.71). Temperature rose from 36.78+0.01 to 37.07+0.02. P value for all vitals was 0.0001, which is considered significant (<0.05). Average weight gain was 76 grams during the average 6 days of KMC inside NICU, (p value=0.0001).

Conclusions: KMC was found to be effective for stabilization of vitals in NICU, early initiation and upgradation of feeding, early achievement of weight gain pattern, and early shift to postnatal ward by mother's side. Also, no adverse effects were noted on the babies.

Keywords: Preterm, KMC, Vitals stabilization, Weight gain

INTRODUCTION

Kangaroo mother care- zero separation and magic of mother's warmth. Kangaroo mother care (KMC) is the first step in care of preterm and low birth weight infants as it helps in establishing both physical as well as emotional bonding between mother and baby. It is now considered a standard of care for LBW neonates in all settings.

KMC is the best form of neuro-developmentally supportive care for the babies. It stimulates all the senses

of the infants in form of seeing the mother, taking smell of mother, hearing mother's voice and having skin to skin contact with mother.

KMC helps in early regaining of birth weight and increases average daily weight gain.¹ KMC promotes stable heart rates, respiratory rates, oxygen saturation, thermoregulation in sick neonates, promotes better weight gain and therefore helps in early discharge of neonate from the hospital.^{2,3} The psychosocial effects of KMC include reduced stress, enhancement of mother-

infant bonding and positive effects on family environment and the infant's cognitive development.⁴

KMC can be compared to the ORS as one of the inventions of the last century in terms of being an inexpensive, simple and feasible method and saving many lives.

KMC is already operationalized in our setup as well as other hospitals in postnatal wards and special KMC rooms. This study attempted towards establishing KMC in a more organized way inside NICU and to observe its positive effects on infant and in turn to establish the role of KMC in reducing high-tech neonatal care for preterm and low birth weight infants which is demanding on the manpower, resources and finances in the developing countries.

METHODS

This study was conducted in NICU, the Department of Pediatrics, Government Medical College & S.S.G. Hospital, Vadodara from February to November 2018.

Study type

Cross-sectional analytical quantitative study

Inclusion criteria

Inclusion criteria were babies with birth weight of <2 kg (preterm as well as full term) requiring NICU admission for low birth weight and other morbidities like Respiratory distress syndrome (RDS), Necrotizing enterocolitis (NEC), sepsis.

Exclusion criteria

Critical infants requiring mechanical ventilation/CPAP, high flow oxygen and babies with major congenital anomaly.

Methodology

Neonatal division of Pediatrics department, S.S.G. Hospital caters to around 7000 deliveries per year. Our LBW rate is nearly 30%.

A total of 80 neonates were enrolled for this study, who weighed less than 2 kg, but required stay in NICU due to other co-morbid conditions like sepsis, RDS, NEC. Their gestational age was assessed by using Meharban Singh scoring system.

Their mothers were called in the NICU, motivated and explained KMC method and its benefits by nurses and doctors and consent taken. KMC was started as soon as baby was stable, and out of critical illness. 5 sessions of KMC, each of 90 minutes, were given to babies after ensuring proper handwashing and hygiene of mother.

Clothing and position of mother

Mothers were provided special KMC gowns. They were given support by our health professionals working in NICU. Mothers provided KMC reclining chairs. During each session the mother wore a loose clothing (front open garment/ a gown) and the baby was positioned inside her clothing and between the breasts in an upright, frog-like position.



Figure 1: Mothers giving KMC within our NICU.



Figure 2: The implementation of KMC in our NICU during night time.

Clothing and position of baby

Baby was kept naked except nappy, caps and mittens. The head of the baby was turned to one side and slightly extended to keep the airway open and allowed eye to eye contact between the mother and the baby. Both forward flexion and hyperextension of head was avoided. Oxygen if required was provided through nasal prongs. Babies requiring intra-venous fluids were provided fluids through infusion pump. During each session, warmer units were switched off. Vitals were monitored and charted before, during and after KMC session by NICU professionals.

During each session, baby's vitals i.e., heart rate, respiratory rate, temperature, oxygen saturation were monitored (taken before and after KMC Session).

Oxygen saturation and heart rate were monitored by Nellcore™ pulse-oximeter during KMC also. Axillary temperature was taken using a digital thermometer. Babies were monitored for apnea and hypothermia. Weight was monitored twice daily, at 7 am and 7 pm using a standard weighing scale.

Data analysis

The data was entered in a password-protected MS Excel file, and analysed using EpiInfo™.

RESULTS

This study was conducted in NICU, Department of Pediatrics, Government Medical college and S.S.G. Hospital, Vadodara. The demographic data of the patients were as follows (Table 1).

Table 1: Demographic characteristics.

Demographic parameters	Number of patients	Percentage (%)
Maturity		
Full term	5	6.25
Pre term	75	93.75
Sex		
Male	48	60
Female	32	40
Mode of delivery		
Vaginal	63	78.75
LSCS	17	21.25
Birth weight (grams)		
<1000	1	1.25
1000-1250	27	33.75
1251-1500	41	51.25
1501-1750	10	12.5
1751-2000	1	1.25
Gestational age		
30 weeks	3	3.75
31 weeks	13	16.25
32 weeks	23	28.75
33 weeks	17	21.25
34 weeks	11	13.75
35 weeks	4	5
36 weeks	3	3.75
37 weeks	4	5
38 weeks	2	2.5

Mean birth weight was 1330 grams (850-2000grams) with majority of babies. Mean gestational age was 33 weeks (30-38 weeks) with 49% babies below 32 weeks. Prematurity (80%) and Low birth weight (56%) were main indications of NICU admission among these neonates, followed by respiratory Distress (37%). KMC was initiated within 72 hours of life in majority of babies (71%).

Figure 3 is showing the time of initiation of KMC in babies. Majority (65%) required oxygen with prongs (2 l/min) and KMC was given with prongs with no episode of apnea observed during KMC sessions. Mean duration of KMC was 6 days (3-14 days), after which these babies were shifted to postnatal wards with their mothers.

Effect of KMC on vitals and weight gain pattern of baby

Vitals were measured before and after each KMC session. statistical analysis was done using SPSS Version 17 for windows, and paired t-test was applied. Vitals remained stable during KMC. Heart rate dropped by 3-4 beats per minute (150+2.12 to 146+1.63, p 0.0001). Respiratory rate decreased from 53+3.9 to 49+2.7. Oxygen saturation improved by 2-3% (93+0.42 to 96+0.71). Temperature rose from 36.78+0.01 to 37.07+0.02. No episode of apnea or hypothermia was observed during KMC sessions.

P value for all vitals was 0.0001 which was considered significant (<0.05). Table 2 shows effect of KMC on vitals.

Average weight gain was 76 grams during average KMC duration of 6 days, with a p value of 0.0001 and t value of 33.5. Minimum weight gain was 25 grams in 3 days of

KMC and maximum weight gain was 130 grams with 7 days of KMC. Weight graph shows sample weight gain of two babies (Figure 4).

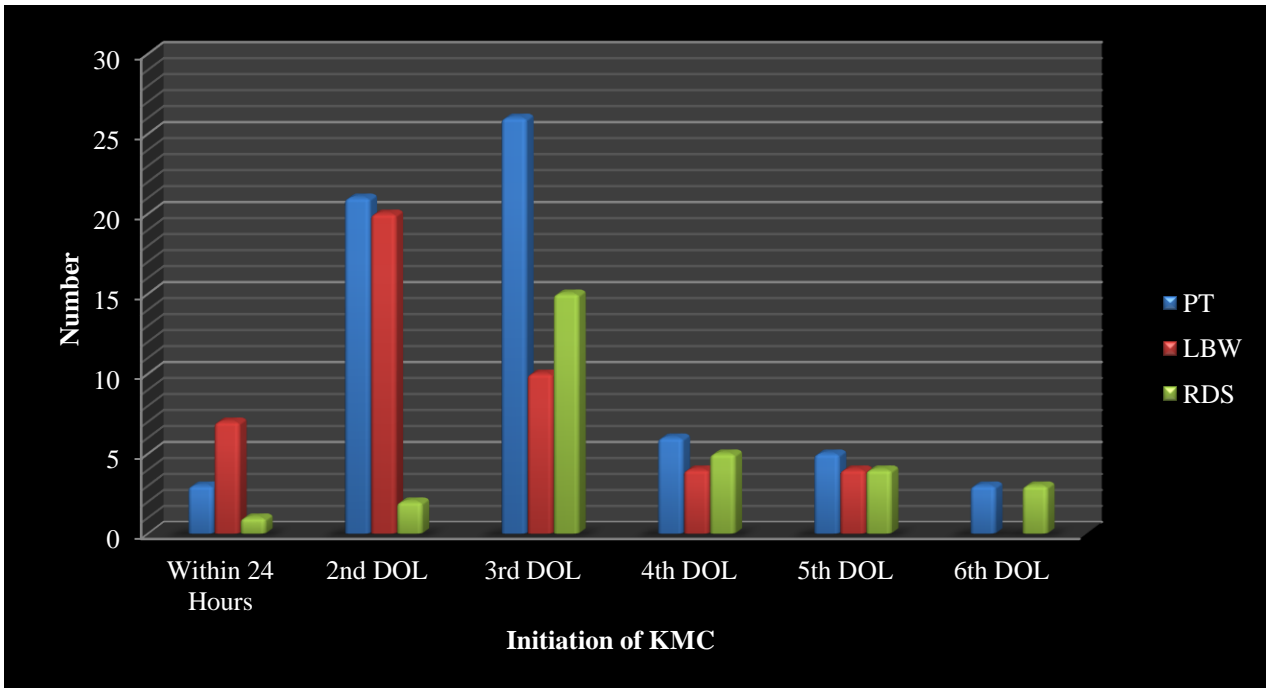


Figure 3: The time at which KMC was started in infants.

Table 2: Comparison of vitals before and after KMC.

Vitals	Mean		Standard deviation	P value	T value
	Before KMC	After KMC			
HEART RATE (bpm)	149.83	146.46	150±2.12 to 146±1.63	0.0001	99.3
RESPIRATORY RATE(/min)	52.87	49.68	53±3.9 to 49±2.7	0.0001	12.6
SPO2(%)	93.04	96.05	93±0.42 to 96±0.73	0.0001	60.3
TEMPERATURE (°C)	36.78	37.07	36.78±0.01 to 37.07±0.02	0.0001	22.9

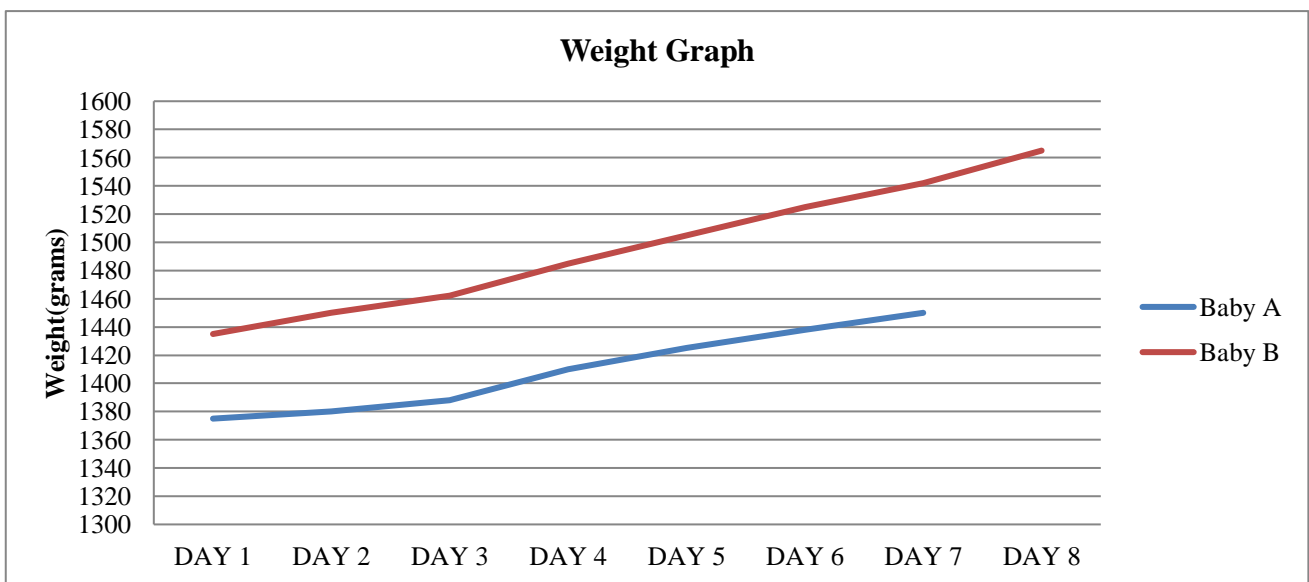


Figure 4: Weight graph comparing pattern of weight gain in 2 babies.

DISCUSSION

KMC is essential for all preterm and low birth weight babies since it is an easy, essential and priceless method which can ensure every aspect of care required by small, sick babies, i.e., nutrition by establishment of lactation, thermal regulation by protection from hypothermia, maintenance of cardiorespiratory stability. The demographic profile, mean gestational age, average duration of KMC inside NICU was comparable with most studies.⁴⁻⁸ In our study, majority of babies i.e., 41(51%) were between 1251 and 1500 grams. In almost all studies, mean birth weight was <1500 grams.⁴⁻⁷ Total 57 (71%) babies initiated KMC within 72 hours.

Since other studies have included the babies who were given KMC outside NICU, so the age of commencement in other studies^{5,6,8} is more as compared to our study. Majority (65%) required oxygen with prongs (2 l/min) and KMC was given with prongs with no episode of apnea observed during KMC sessions. No episode of hypothermia was noted as also earlier documented.^{7,9-11}

A response has been noted that human babies, when separated from mothers give a 'separation distress call' and a 'comfort response' upon reunion with the mother. KMC provides the opportunity to overcome the separation response.¹² The hypothesis of a "butterfly effect" means that the smallest changes induced by KMC after birth in the premature brain could result in substantial differences of function over time. Role of KMC in stabilization of vitals has already been established.^{5-9,13} It was observed that KMC is effective in stabilization as well as maintenance of vitals inside NICU as well (p value for all vitals was <0.05). Thus, feasibility of KMC was established inside NICU since there was no episode of apnea or hypothermia during KMC sessions and no deterioration of vitals during these sessions was observed. Role of KMC in weight gain of babies has been documented well in the literature.^{4-6,8,13}

In our study as well, weight gain pattern was observed but the average weight gain was less in comparison to other studies since most of the babies were free of morbidities and so the weight gain was more in these studies.^{5,6,8} In comparison, babies were admitted inside NICU in our study so the effect on weight gain was masked by concurrent morbidities and initial days of physiological weight loss. Thus, KMC fulfills babies need for warmth, breastfeeding, stimulation, safety, protection from infection, vitals stability and emotional bonding as well as acts as an analgesic for the baby.^{11,14,15}

Limitations

KMC could not be initiated in critical babies requiring mechanical ventilatory support or ionotropes.

CONCLUSION

KMC was found to be effective for stabilization of vitals as well as weight gain in the intensive care settings as well with no adverse effects noted on babies.

Advocating KMC inside NICU also decreased the use of servo control warmers, which in turn saved electricity. Also, it resulted in decreased morbidity which accounted for better survival and early discharge thus increasing the credibility of NICU.

Latest review suggests that WHO also recommends family-centred care for low-birth-weight infants, and KMC functions as complete package for neurodevelopmental supportive care.

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Conflict of interest: None declared

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

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