

Research Article

Improving Post-discharge Weight Gain Among Neonates received Kangaroo Mother Care: Two Years Experience of a Tertiary Care Hospital in Dhaka, Bangladesh

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Abstract

Background: “Kangaroo Mother Care” is an effective alternative care strategy for preterm and low birth weight babies. It also causes substantial reduction of neonatal mortality due to hypothermia.

Objective: To observe the status of ongoing kangaroo mother care service in a tertiary care hospital and its outcome.

Material and method: This retrospective study was carried out over the period of 1st July 2020 to 30th June 2022. Newborns who received kangaroo mother care in neonatal intensive care unit and postnatal ward of Bangabandhu Sheikh Mujib Medical University, Dhaka during the study period, were enrolled in this study.

Results: A total of 384 (97% of eligible candidates) newborn received kangaroo mother care. Kangaroo mother care was provided both in Neonatal intensive care unit (86% of total admission) and also in the postnatal ward. Mean gestational age was 32.02±2.85 weeks (28 weeks-41 weeks) and mean weight of starting KMC was 1367.48 g (730 g - 1970 g). Average age of initiating KMC was 6 days (ranging from 1 to 13 days of age). Mean duration of providing KMC was 6 hours and 50 minutes. More than two third (74.4%) patients came for follow up. During each follow up, an increasing trend was observed regarding weight gain and mean weight gain was 15.9±1.2 g/ kg/day.

Conclusion: Kangaroo mother care was provided to most of the eligible patients and persistent weight gain was observed among all KMC candidates after discharge.

Keywords: Kangaroo Mother Care; Bangabandhu Sheikh Mujib Medical University

Introduction

The first 28 days of life - the neonatal period is the most vulnerable time for a child's survival. Globally, 2.4 million children died in the first month of life and in 2020 approximately 6,500 neonatal deaths take place every day, amounting to 47% of under 5 mortalities [1]. Low Birthweight (LBW) and, or, prematurity are well known risk factors for neonatal morbidity and mortality [2]. Infants with low birth weight constitutes approximately 15% of all births globally but account for 60% to 80% of all neonatal deaths and about two thirds of infant death [3,4]. Ten countries account for 60% of world preterm births and Bangladesh ranks seventh among them [5]. Reducing mortality among these infants, particularly those born in low- and middle-income countries in Asia and sub-Saharan Africa, is therefore key to the achievement of the United Nations Sustainable Development Goals target of reducing neonatal mortality to a level at least as low as 12 deaths per 1000 live births in all countries by 2030 [3,6]. There are

multitudes of recommended means to reduce LBW related mortality [7,8]. Kangaroo Mother Care (KMC) is the practice of providing continuous and prolonged skin-to-skin contact between mother and baby, exclusive breast milk feeding, and early discharge from the hospital [9,10]. It was first suggested by Edgar Rey who introduced IT in Bogota, Columbia, as an alternative to the conventional contemporary method of care for LBW infants to address the lack of incubators, high rate of nosocomial infections, and infant abandonment in the local hospital [11]. Over time, it became evident that, in limited resource countries, KMC provides protection from sepsis, adequate thermal control and activation of respiratory nervous centers, thus improves the survival of the neonates by decreasing the mortality and morbidity [9,12-13]. In fact, KMC With ever increasing evidence of multiple benefits, has become a widely recommended method of care for stable LBW infants [14]. To avert the deaths due to prematurity, in 2015, the World Health Organization (WHO) recommended KMC for the routine care in health facilities of newborns weighing 2,000 grams or less at birth, starting as soon as the newborns are clinically stable [15]. There has been a steady downward trend in childhood mortality in Bangladesh, with a 46% decline in neonatal mortality and a 65% decline in under-five mortality [16]. Considering the benefits of KMC for the neonate population, it was adopted by the Government of Bangladesh in 2013 and the service is expanding throughout the nation [16,17]. The kangaroo mother care national guidelines were approved and the training manual was developed in 2015 [18]. Neonatology department of Bangabandhu Sheikh Mujib Medical University (BSMMU), one of the renowned medical universities of Bangladesh has initiated KMC for premature and low birth weight babies from the beginning as well. So, this study was aimed to determine the success of ongoing kangaroo mother care in terms of KMC coverage and outcome of newborns receiving kangaroo mother care in this tertiary level hospital, BSMMU.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore was exempt.

Material and Methods

This hospital-based retrospective study was conducted in the Department of Neonatology, Bangabandhu Sheikh Mujib Medical University (BSMMU), a tertiary level hospital in Bangladesh, after approval by Institutional Review Board. The duration for retrospective data collection and analysis was 24 months from 1st July 2020 to 30th June 2022. Neonates who were admitted in NICU and postnatal ward of BSMMU with birth weight less than 2000 gm and got kangaroo mother care were enrolled in the study after getting informed consent from the parents. Before initiation of kangaroo mother care babies were hemodynamically stable, mother along with other family members were counselled properly for providing the care. Whole procedure for providing KMC was shown practically to care giver by the department's assigned KMC manager and responsible bed nurse. The newborn was placed almost naked (except for a cap, diaper and mittens) between the mother's or care giver's breasts (for as long as possible), in a strictly vertical position, with his belly in direct contact with his mother's or caregiver's skin, his head turned to the side, his arms and legs spread out. A sling or binder was used to hold the baby. Mothers were advised for sleep in a reclining/half sitting position in bed or kangaroo mother care chairs. The kangaroo position was maintained until the baby can no longer tolerate it and feels the need to come out. Feeding was started with a feeding tube and then, depending on the level of neurological maturation, given by cup and spoon and finally by suckling the breast. In postnatal ward counselling was done and provided KMC to all the eligible newborn by arranging separate corner and maintaining proper privacy.

Daily records were kept in KMC form and at the time of discharge data were enrolled in KMC registrar. After discharge, babies were followed up weekly in outpatient department. Those who could not come for follow up, the required information was collected via telephone. Parents measured the weight at nearby health complex or any private hospital or chamber of any pediatricians and then informed data collector. All necessary documents were extracted from the KMC registrar which include baby's gender, birth weight, gestation, mode of delivery, weight at initiation of kangaroo mother care, discharge weight, weight on subsequent follow up, outcome. Data were analyzed using SPSS with statistical package Version 25 (SPSS Inc., Chicago, IL). Numerical data were expressed as mean, standard deviation, and range. Qualitative data were expressed as frequency and percentage.

Results

During this study period, 871 newborns were admitted in neonatal intensive care unit of BSMMU. There were 395 KMC candidates which constitutes 44% of total admission, among them 384 (97.2%) newborn got kangaroo mother care. We provided KMC to all the eligible newborn in postnatal ward by arranging separate corner and maintaining adequate privacy (Table 1).

Study Place	Number of Neonates Got KMC (n=384)	Percentage
NICU	331	86
Post-natal ward	53	14

Table 1: Distribution of neonates according to place of providing KMC.

Mean gestational age was 32.05 ± 2.85 weeks and mean birth weight was 1367.48 ± 287.37 g as shown in Table 2. Average age to start KMC was 6 days (ranging from 1 to 13 days of age).

Variable	No of Patients (n=384)	Percentage
Mean gestational age (weeks)	32.05 ± 2.85 (Range: 28-41)	
Gestational age category		
< 28 weeks	12	4
28 - $\leq$ 31 weeks	106	27
32 - $\leq$ 34 weeks	211	55
35-40 weeks	55	14
Mean birth weight (g)	1367.48 ± 287.37 (Range: 730-1970 g)	
Birth weight category		
<1000	26	7
1000- 1499	204	53
1500- 1999	152	40

Table 2: Baseline characteristics of the studied population.

Most of the babies were delivered by lower uterine caesarian section (n=264; 68.8%) and remaining 31.2% were born by normal vaginal delivery. Male-female ratio was 1.6 (F = 235; M = 149). Among the study population, 87.5% were inborn (born in BSMMU) and 12.5% were out born (born outside BSMMU). Mean duration of kangaroo mother care was 6 hours and 50 minutes. The main reasons for discontinuation of care were maternal discomfort, lack of family support and increase household workload (Table 3).

Fig. 1 shows that there was persistent weight gain in patients who got KMC from discharge to follow up visits (n=286).

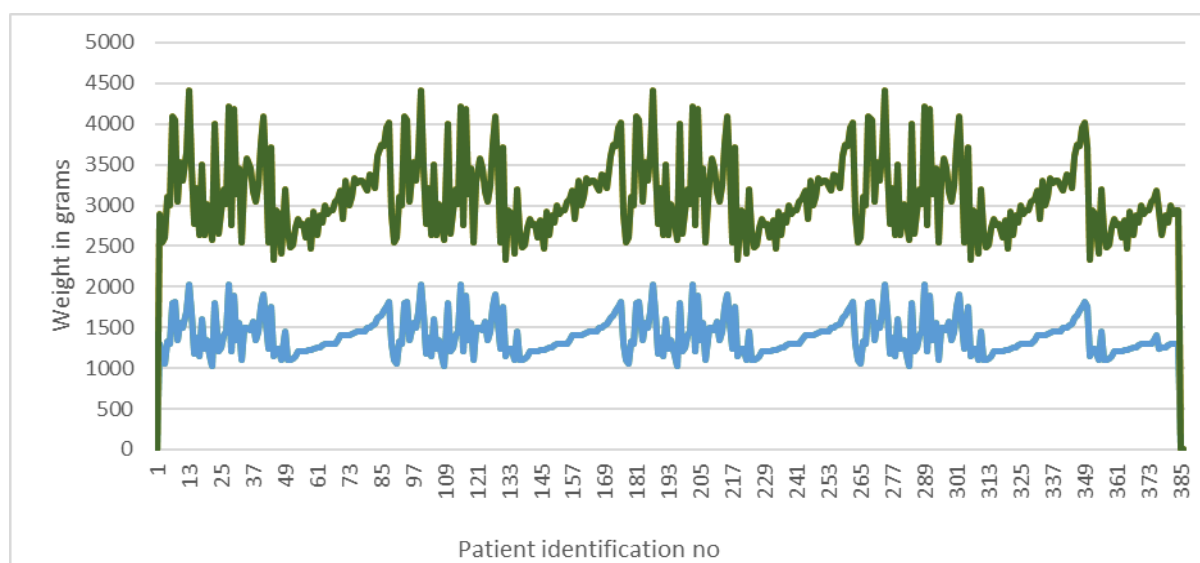


Figure 1: Graphical presentation of weight gain pattern among studied neonates during discharge and follow up (Blue line represents newborn weight on discharge and green line represents newborn weight on last follow up).

Weight (in grams)	Mean $\pm$ SD (n=384)	Median (interquartile range)
Discharge weight	(1393.16 $\pm$ 227) g	1340 (1030-2020) g
Weight on 1 st follow up	(1490.51 $\pm$ 235.2) g	1450 (1100- 2100) g
Weight on 2 nd follow up	(1616.5 $\pm$ 274.6) g	1560 (1030- 2670) g
Weight on 3 rd follow up	(1727.73 $\pm$ 253.5) g	1700 (1180- 2400) g
Weight on 4 th follow up	(1872.5 $\pm$ 233.4) g	1820 (1320- 2560) g

Table 3: Weight gain pattern of studied neonates with subsequent follow up.

Table 3 also showed a persistent weight gain when they were followed up every 7 days interval. About 74.4% patients came to follow up for consecutive 4 weeks (n=286). Average weight gain observed in babies was 15.9 + 1.26g/kg/day. Majority of the patients were discharged to home (98%) as shown in Fig. 2.

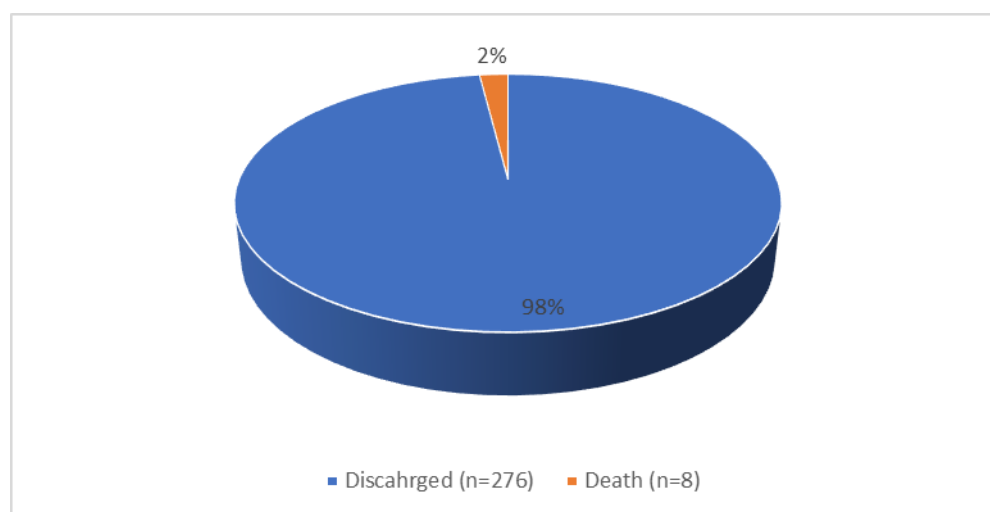


Figure 2: Outcome of the studied neonates who got KMC.

Discussion

In Bangladesh, Kangaroo mother care program was implemented on 2015. Bangabandhu Sheikh Mujib Medical University (BSMMU), was the pioneer institute, in starting kangaroo mother care from April, 2015. During this study, a total of 395 babies were eligible for kangaroo mother care and among them 97.2% (384 patients) were provided with the KMC service due to instability of vitals, lack of proper family support and maternal motivation. This data definitely reflects the good coverage of the service in the department which could not be compared with others due to lack of similar reports. In the current study mean gestational age was 32.02 $\pm$ 2.85 weeks (28 weeks-41 weeks), and mean birth weight of starting KMC was 1367.48 $\pm$ 287.4 g (730 g - 1970 g). This result is lower than that of Ugochukwu et al. in Nigeria, who found that 46.6% of premature babies weighed between 1500 and 1990 g [19]. In a study done in Mali by F. Traoré et al., they found that the mean birth weight was 1300 g (600 g -2000 g) and mean gestational age was 32.69 (28 - 37) which was nearly similar to our finding [20]. KMC was provided to both inborn, out born patients in NICU and postnatal ward. After delivery babies who were hemodynamically stable but had only birth weight <2000g, got KMC at mother side in postnatal ward. In postnatal ward KMC was provided to 100% eligible candidates by both mother and other family members. We found no contemporary study mentioning providing KMC in postnatal ward. In a study done in Mali by F. Traoré et al., The sex ratio was 1:2. [20]. This finding is similar with the current study, where females were predominant (M:F -1:1.6). Around two third of the newborn were delivered by lower uterine cesarean section.

In the year 2017, a randomized controlled trial done by Rahman M, et al., showed that KMC is effective for caring of LBW babies and has better effect on weight gaining and establishment of exclusive breast feeding. They found average weight gain of 18.1 $\pm$ 7.7 g/day [21]. Our study also showed that KMC was effective in gaining weight, but our average weight gain in follow up was little bit low, that is 15.9 $\pm$ 1.27 g/kg/day. Due to retrospective nature of this study, we could not evaluate the confounding factors. In India 6.5% mother felt that KMC could be given 12 hour/day or greater and 52% mother felt that KMC could be given practically 1 hour/day. Only 23.8% mother practiced skin to skin contact for more than 7 hours/day in first 48 hours of life, and

the average number of hours of KMC was 2.7+ 3.4 hours [22]. In our study we found that average KMC hours were 6 hours and 50 minutes, ranging from 2 hours to 9 hours per day maximum, we could not provide KMC for maximum time due to maternal sweating, lack of care giver and proper family support. Although KMC is a key intervention package in newborn health initiatives, there are several barriers to KMC practice. These barriers can exist in multiple levels, including barriers to implementation of a KMC program, or specific challenges associated with the practice of KMC which mother has to perform. [23]. In one systemic review shows that the top barriers to KMC practice are- issues with facility environment, negative impressions of staffs, low awareness, lack of confidence and family, community support [24]. The main barrier for KMC observed in this study was absence of appropriate helper of mother that means any person, nurse or family member who helps mother during KMC practice, during her discomfort and bathing etc. Studies done in India, Ghana, Bangladesh showed that mothers who were trained, practicing KMC or got message about KMC, could understand about KMC and knew the benefits of KMC [23-25]. Several studies in South Africa and Ghana, showed that mother belief in the benefit of KMC, improvement of health of child by practicing KMC and hearing the success story about KMC were the main motivation to continue KMC [25,26]. In our study mortality rate was 2% and 98 % were discharged among the patients receiving KMC. Whereas overall mortality rate in neonatal intensive care was 9.6% in last 2 years. We counted the death that occurred within the facility during this study period, not after discharge. Another study showed a downward trend in deaths of babies receiving kangaroo mother care over the study period. The overall mortality was 1.2% (77/6410), with large quarterly fluctuations in mortality [27]. We have better follow up (74.4%) because of presence of KMC manager in our unit who kept in touch with parents over telephone and also motivated them to continue home KMC and come for follow up. In a study done in Mali, post-discharge follow-up was low and only 15-20% of babies received four follow-up visits. [28]. The retrospective nature of our study affected the quality of the analysis of certain parameters. The incompleteness and loss of some records excluded some newborns from the study. We also could not collect other socio demographic characteristics of mothers and neonates.

Conclusion

In NICU and postnatal ward of BSMMU, kangaroo mother care was provided to most of the eligible patients. KMC was associated with persistent weight gain seen in follow up visits. Raising parent's awareness at the time of admission will allow good long-term follow-up of patients.

Conflict of Interests

The authors have no competing interests that are relevant to the content of this article to declare.

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Statements and Declarations

All authors had access to the data and a role in writing the manuscript, with no disclaimers and patient consent was obtained.

Financial Disclosure

No funding was not involved in the manuscript writing, editing, approval or decision to publish.

Data Availability

Data Availability Statement: All data generated or analyzed in this study are included in this article. Access to data is possible with permission from the responsible author.

Consent for Publication

Informed consent was obtained from the patient for publication of this case report and is stated in the manuscript.

Authors Contribution

All authors contributed equally for this paper.

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