International Journal of Contemporary Pediatrics
*Patel JS et al. Int J Contemp Pediatr. 2021 Feb;8(2):285-288*
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20210114

**Original Research Article**

# Outcome of kangaroo mother care in terms of hospital stay among preterm infants in a tertiary health care center Bhuj, Kutch: a cross-sectional study

**Jaivik Sureshbhai Patel*, Gopi Alabhai Solanki**

Department of Pediatrics, Gujarat Adani Institute of Medical Science, Bhuj, Kutch, Gujarat, India

**Received:** 08 November 2020
**Accepted:** 06 January 2021

***Correspondence:**
Dr. Jaivik Sureshbhai Patel,
E-mail: pateljaivik40@gmail.com



## ABSTRACT

**Background:** Neonates born before 37 completed weeks of pregnancy are called premature infants. The birth of premature infants is associated with several problems, such as frequent hospital admissions, infections, apnea and others. Evidence suggests that kangaroo mother care is effective and safe alternative to conventional neonatal care, especially in under-resourced settings and may reduce morbidity and mortality in low birth weight infants as well as increase breastfeeding.
**Methods:** Present observational study conducted in the department of pediatrics, Gujarat Adani Institute of Medical Sciences, Bhuj, Kutch, Gujarat for the Duration of 1 year. Source of data are all live new born of gestational age of less than 37 weeks and birth weight below 2500 gm delivered at GAIMS, Bhuj. Primary outcome measures were: rate of infection time frame 1-2 weeks (during hospital stay), frequency of presume sepsis and need for antibiotics, length of stay (time frame 1-2 weeks) and total days in hospital during recruitment period.
**Results:** An average length of hospital stay was 15.31±12.01 days among neonates in our study group. Among those with infection duration of stay was 21.03±15.627 days and among those without infection were 12.09±10.402 days. There was significant difference in length of hospital stay among those with infection and without infection.
**Conclusions:** Kangaroo mother care improves physiological indices in normal levels, thus it might positively influence the premature infant's physical health. The present study has important implications in the care of preterm and LBW infants in the developing countries, where expensive facilities for conventional care may not be available at all places.

**Keywords:** Kangaroo mother care, Kutch, Neonates, Neonatal care

## INTRODUCTION

Preterm babies are susceptible to serious illness or death in the neonatal period. Without appropriate treatment, among those who survive are at higher risk of lifelong disability and poor quality of life. Complications of prematurity are single largest cause of death among neonates and the second leading cause of deaths among children under the age of 5 years. To further reduce child mortality global efforts demand immediate action to address preterm birth. Infant death and morbidity following preterm birth can be reduced via interventions provided to the mother before or during pregnancy and to the preterm infant post birth. Interventions are directed towards all women for primary prevention and towards reduction of the risk of preterm birth or used to minimize the risk in pregnant women with known risk factors.

Neonates born before 37 completed weeks of pregnancy are called premature infants. The birth of premature infants is associated with several problems, such as frequent hospital admissions, infections, apnea and others.[1] Despite the comprehensive efforts to prevent premature delivery and birth of premature infants, the

birth rates of such infants are high due to some medical problems, social status and infertility treatment.[2,3] Kangaroo mother care (KMC) was first started in Colombia in 1978.[4] It is a comprehensive intervention given for all newborns especially for premature and low birthweight (LBW) infants. Kangaroo mother care is the most feasible, readily available, and preferred intervention for decreasing neonatal morbidity and mortality in developed and developing countries, and suitable for use in all settings.[5] The three major components of kangaroo mother care are: 1) Kangaroo position: Skin to skin contact. 2) Kangaroo feeding policy: Exclusive breast feeding. 3) Early discharge and follow-up.

Every year, 20 million and more infants are born with birth weight less than 2.5 kg and over 96% of them are in developing countries. These low-birth-weight (LBW) infants are at increased risk of early growth retardation, developmental delay, infectious disease, and death during infancy and childhood.[6] Conventional neonatal care of LBW infants needs both highly skilled personnel and permanent logistic support and is expensive. Evidence suggests that kangaroo mother care is effective and safe alternative to conventional neonatal care, especially in under-resourced settings and may reduce morbidity and mortality in low birth weight infants as well as increase breastfeeding.

## METHODS

Present observational study conducted in the department of pediatrics, Gujarat Adani Institute of Medical Sciences, Bhuj, Kutch, Gujarat for the Duration of 1 year. Source of data are all live new born of gestational age of less than 37 weeks and birth weight below 2500 gm delivered at GAIMS, Bhuj. Age eligible for study was newborns up to 4th week of life.

### *Inclusion criteria*

Infant weight at birth less than 2500 grams, neonatal birth age of 34-36 weeks of gestation, neonates stable enough to leave the incubator and be with the mother, and the newborn has not undergone surgery.

### *Exclusion criteria*

Neonates too sick to participate in the study, neonates on mechanical ventilation, maternal illness or complications preventing her from caring her baby, decline parental consent before or during the study. The newborns who met the inclusion criteria were selected by convenience sampling to complete the sample size (120 neonates).

### *Kangaroo mother care*

Other than routine care per hospital policy, infants receive skin-to-skin contact for a minimum 8-10 hours daily during hospital stay.

Baby's weight, length and head circumference was measured and recorded till 4th week life including follow up.

### *Primary outcome measures*

Rate of infection (time frame 1-2 weeks (during hospital stay). Frequency of presume sepsis and need for antibiotics. Length of stay (time frame 1-2 weeks). Total days in hospital during recruitment period.

### *Statistical analysis*

The data were analyzed using SPSS version 15. For all tests, confidence level and level of significance were set at 95% and 5% respectively.

## RESULTS

In the study duration of KMC in terms of hours given by the mothers per day was 4 to 6 in 4.5%, 6 to 8 in 40.5%, 8 to 10 in 43%, 8 to 12 in 10.5% and 10 to 12 in 1.5%. In the study out of 120 babies, 33.5% had infection and 66.5% had no infection.

An average length of hospital stay was 15.31±12.01 days among neonates in our study group. Among those with infection duration of stay was 21.03±15.627 days and among those without infection were 12.09±10.402 days. There was significant difference in length of hospital stay among those with infection and without infection (Table 1).

**Table 1: Length of stay distribution and comparison with infection.**

| Variable | Infection | Mean±SD | P value |
|---|---|---|---|
| **Length of Hospital stay** | Present | 12.09±10.04 | 0.05* |
| | Absent | 21.03±15.62 | |
| **Total** | | 15.31±12.01 | |

*Indicates statistically significant difference at p=0.05; p=0.001 HS: Highly significant
Test of significance- student t test, SD: Standard deviation

## DISCUSSION

Despite the existence of properly trained personnel and good quality equipment centralized in a few referral institutions, the sizably voluminous demand for tertiary care far exceeds capacity, leading to a suboptimal quality of care for many. The complete KMC, including early discharge, skin-to-skin contact, and good quality nutrition based primarily on breastfeeding, has the largest potential for benefit in this environment.

Babies whose birth weight was less than 2500 grams who fulfilled our inclusion criteria and had stable cardiopulmonary status and mothers who were willing to participate in the study were taken into the study, 120 infant mother dyads were studied physical and

physiological parameters namely vitals and weight gain, length and head circumference was recorded.

KMC aids food absorption by increase in oxytocin release.[7] The ultimate end point of metabolism is somatic growth, measured by weight gain. The data showed an increased rate or rapidity of weight gain for infants who received the intervention (KMC) than for the control groups who received the standard protocol neonatal care.

A randomized trial study was conducted to determine the evidence to support the use of KMC in low birth weight infants. The result showed that KMC was associated with reduced risk of following conditions; nosocomial infection, severe illness, lower respiratory diseases, not exclusively breast feeding and maternal dissatisfaction. It concludes that cost of neonatal care were greater in the control than in the KMC group.[8]

An important mainstay of kangaroo mother care is breastfeeding encouragement. Although evidence shows countless benefits of breastfeeding for preterm babies.[9-13] The Preterm infant breastfeeding duration- including breast milk feeding- has been found to be shorter than fullterm infants.[14] In a randomized controlled study conducted in Sweden with 71 preterm babies weighing less than 1500 gm, Whitelaw et al found that babies submitted to KMC had a two times higher prevalence of breastfeeding than the control group at six weeks of life (55 versus 28%).[15] Ramanathan et al in New Delhi, India found similar results in a study with 28 preterm babies, in which the frequency of breastfeeding at six weeks of life amounted to 85.7% for babies submitted to KMC versus 42.8% for control individuals.[16]

A study was conducted regarding the effectiveness of KMC in preventing neonatal death due to preterm birth complications. KMC includes thermal care via continuous skin-skin contact, establishing exclusive breast feeding and early response for illness. The study concludes that KMC reduces neonatal mortality effective in reducing severe mortality, particularly from infection.[8] Babies in the KMC group had significantly higher oxygen saturation as compared to the CMC group (94.51 versus 92.652) and these findings are in accordance with Acolet et al, Bier et al, and Fohe et al.[17-19] In this study 35% had infection and 65% had no infection. Length of hospital stay was 15.31±12.01 days. Among those with infection duration of stay was 21.03±15.62 days and among those without infection were 12.09±10.04 days. There was significant difference in length of hospital stay among those with infection and without infection.

## CONCLUSION

Kangaroo mother care improves physiological indices in normal levels, thus it might positively influence the premature infant's physical health. The present study has important implications in the care of preterm and LBW infants in the developing countries, where expensive facilities for conventional care may not be available at all places.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: The study was approved by the Institutional Ethics Committee*

## REFERENCES

1. Charpak N, Ruiz-Peláez JG, Charpak Y. Rey-martinez kangaroo mother program: an alternative way of caring for low birth weight infants? One year mortality in a two cohort study. Pediatrics. 1994;94(6):804-10.
2. Tharashree CD, Shravani MR, Srinivasa S. The effect of kangaroo mother care (KMC) on breast feeding at the time of NICU discharge. Int J Contemp Pediatr. 2018;5(3):1068-71.
3. Charpak N, Ruiz-Peláez JG, De Calume Figueroa Z. Current knowledge of kangaroo mother intervention. Curr Opin Pediatr. 1996;8(2):108-12.
4. Martinez G, Rey S, Marquette C. The mother kangaroo programme. Int Child Health. 1992;3:55-67.
5. Lawn JE, Cousens S, Zupan J, Team LNSS. 4 million neonatal deaths: when? Where? Why? Lancet. 2005;365(9462):891-900.
6. World Health Organization. Standard formula for low-birth-weight infants following hospital discharge. Available at: https://www.who.int/elena/titles/formula_infants/en/ Accessed 10 March 2020.
7. Ludington-Hoe MS. Evidence-based review of physiologic effects of Kangaroo Care. Curr Women's Health Rev. 2011;7(3):243-53.
8. Conde-Agudelo A, Díaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Systemat Rev. 2016(8).
9. Gartner LM, Morton J, Lawrence RA, Naylor AJ, O'Hare D, Schanler RJ, et al. Breastfeeding and the use of human milk. Pediatrics. 2005;115(2):496-506.
10. Amin SB, Merle KS, Orlando MS, Dalzell LE, Guillet R. Brainstem maturation in premature infants as a function of enteral feeding type. Pediatrics. 2000;106(2):318-22.
11. Carlson SE, Cooke RJ, Rhodes PG, Peeples JM, Werkman SH, Tolley EA. Long-term feeding of formulas high in linolenic acid and marine oil to very low birth weight infants: phospholipid fatty acids. Pediatr Res. 1991;30(5):404-12.
12. Lucas A, Morley R, Cole T, Lister G, Leeson-Payne C. Breast milk and subsequent intelligence quotient in children born preterm. Lancet. 1992;339(8788):261-4.
13. Saenz P, Quero J. Studio de la maturacion intestinal em neonatos com isótopos estables. Rev Med Univ Navarra. 1999;42:77-82.

14. Flacking R, Wallin L, Ewald U. Perinatal and socioeconomic determinants of breastfeeding duration in very preterm infants. Acta Paediatr. 2007;96(8):1126-30.
15. Whitelaw A, Heisterkamp G, Sleath K, Acolet D, Richards M. Skin to skin contact for very low birthweight infants and their mothers. Arch Dis Childhood. 1988;63(11):1377-81.
16. Ramanathan K, Paul V, Deorari A, Taneja U, George G. Kangaroo mother care in very low birth weight infants. Indian J Pediatr. 2001;68(11):1019-23.
17. Acolet D, Sleath K, Whitelaw A. Oxygenation, heart rate and temperature in very low birth weight infants during skin-to-skin contact with their mothers. Acta Pediatr Scand. 1989;78(2):189-93.
18. Bier JA, Ferguson AE, Morales Y, Liebling JA, Archer D, Oh W, et al. Comparison of skin-to-skin contact with standard contact in low-birth-weight infants who are breast-fed. Arch Pediatr Adoles Med. 1996;150(12):1265-9.
19. Fohe K, Kropf S, Avenarius S. Skin-to-skin contact improves gas exchange in premature infants. J Perinatol. 2000;20(5):311-5.

**Cite this article as:** Patel JS, Solanki GA. Outcome of kangaroo mother care in terms of hospital stay among preterm infants in a tertiary health care center Bhuj, Kutch: a cross-sectional study. Int J Contemp Pediatr 2021;8:285-8.