Research Paper

Volume : 4 | Issue : 12 | December 2015 • ISSN No 2277 - 8179

Effects of Kangaroo Mother Care on Common Vital Parameters of Preterm Infants

Medical Science

KEYWORDS : kangaroo mother care, bradycardia, and oxygen desaturation

Dr. Rangadhar sutar	Department of paediatrics, Hi tech Medical college and hospital, pandara, rasulgarh, Bhubaneswar, pin- 751025
Dr. Suryakanta Baraha	Department of paediatrics, Hi tech Medical college and hospital, pandara, rasulgarh, Bhubaneswar, pin- 751025
Dr. Prithi Sureka Mummidi	Department of paediatrics, Hi tech Medical college and hospital, pandara, rasulgarh, Bhubaneswar, pin- 751025

ABSTRACT

Aim: To compare common vital parameters like heart rate, respiratory rate and oxygen saturation in preterm infants under radiant warmer versus Kangaroo Mother Care (KMC).

Methods: We randomly assigned thirty six clinically stable preterm infants admitted in NICU to 2 sessions of KMC each for 2 hours each daily or to standard under warmer care. Vital parameters recorded on hourly basis was collected under 3 sets of data : standard warmer care group 24 hours daily, KMC group during warmer care time 20 hours daily, and KMC group during 4 hours of holding time daily.

Result: KMC group had fewer bradycardia events, apnea attacks and oxygen desaturation events per hour while being held compared to time spent in a warmer. There was no significant difference between the KMC group during warmer care time and the standard warmer care group in frequency of common vital parameters.

INRODUCTION:

Newborn deaths currently account for approximately 40% of all deaths of children under five years of age in developing countries—the three major causes being birth asphyxia, infections, and complications due to prematurity and LBW [1]. Birth weight is a significant determinant of newborn survival. LBW is an underlying factor in 60–80% of all neonatal deaths. LBW infants are approximately 20 times more likely to die, compared with heavier babies [2].

Rates of cerebral palsy, sensory deficits, learning disabilities, and respiratory illnesses are high in preterm babies compared with children born at term. The morbidity associated with preterm birth often extends to later life, resulting in enormous physical, psychological, and economic costs [3]. Researchers have provided hospitalized preterm infants with various forms of supplemental stimulation in an effort to enrich the environment of the neonatal intensive care unit (NICU) or to accelerate development [4, 5]. The most widely studied intervention is kangaroo mother care. In developing countries like India, financial and human resources for neonatal care is limited and hospital wards for LBW infants are often overcrowded [6].

The term KMC is derived from similarities to marsupial caregiving. The mothers are used as "incubators" and as the main source of food and stimulation for LBW infants while they mature enough to face extrauterine life in similar conditions as those born at term [7]. Kangaroo mother care is defined as "Early, prolonged and continuous skin to-skin contact between the mother and low birth weight infant both in the hospital and after discharge with exclusive breastfeeding and proper follow-up" [7]. Kangaroo mother care regularizes heart rate and respirations, deepens sleep and alert inactivity, reduces crying, prevents infections, shortens the neonatal hospital stay, enhances weight gain, improves physical growth and breastfeeding rates, decreases pain from heel prick procedure, and lessens maternal depression [6, 8].It ensures optimum growth and development of the infant [9]. Initially devised as an alternative to conventional technology-based care, KMC is now considered as a standard of care for LBW infants for all settings as an adjunct or alternative to conventional technology based care. KMC is effective for promoting physiological stability, positive developmental outcomes in preterm infants and also reducing the hospital stay.

AIM:

To compare common vital parameters like heart rate, respiratory rate and oxygen saturation in preterm infants under radiant warmer versus KMC.

METHODS:

A study was conducted with a convenience sample of 36 subjects at the NICU of a tertiary care hospital of eastern India over a period of 18 months. Infants born at gestational age of 32-34 weeks and weighing at least 1200 gram, and medically stable were included and those who were medically unstable, had any congenital, orthopaedic, or genetic abnormality, or were ventilated were excluded. Informed consent was taken from the parents. The mothers were counselled regarding benefits of KMC. We randomly assigned these thirty six clinically stable infants admitted in NICU to 2 sessions of KMC each for 2 hours each daily between 7 to 14 days of life or to standard under warmer care. Parents gave consent to randomize the neonates into KMC group and standard warmer care group starting on day 7 of life and continuing for 7 days. The study was conducted in in a special room with sufficient privacy close to NICU where healthcare providers are strongly motivated and maintain close supervision.

The baby was placed upright inside mother's clothing against bare skin of the chest and abdomen. Head was turned to one side and placed in a slightly extended position .The hips were kept flexed and abducted in a 'frog' position; the arms were also flexed. Repeated counselling and demonstration of KMC were done to mothers initially till they were able to offer KMC confidently and correctly. Vital physiological parameters of the baby, namely respiration rate, heart rate, and oxygen saturation, were assessed in all 3 groups of neonates per hourly basis. Heart rate and oxygen saturation were recorded with the help of pulse-oximeter. The thirty six babies enrolled in the study were monitored for bradycardia (heart rate <90) or oxygen desaturation (<85%) or bradypnea / apnea . Vital parameters recorded on hourly basis was collected under 3 sets of data : standard warmer care group 24 hours daily, KMC group during warmer care time 20 hours daily, and KMC group during 4 hours of holding time daily. The hourly means of the events were calculated and compared with each other.

RESULTS:

Analysis of variance showed a significant main or overall effect of treatment group on bradycardia (p= 0.0023) and oxygen desaturation (p<0.001). From the study we found that the KMC group had fewer bradycardia events per hour while being held compared to time spent in a warmer (p = 0.0153). The KMC group also had significantly fewer apnea attacks and oxygen desaturation events while being held than while in the warmer (p <0.001) and significantly fewer desaturation events or apnea episodes than infants in standard warmer care (p=0.0032). There was no significant difference between the KMC group during warmer care time and the standard warmer care group in frequency of bradycardia or oxygen desaturation events.

TABLE 1 : Hourly means of bradycardia

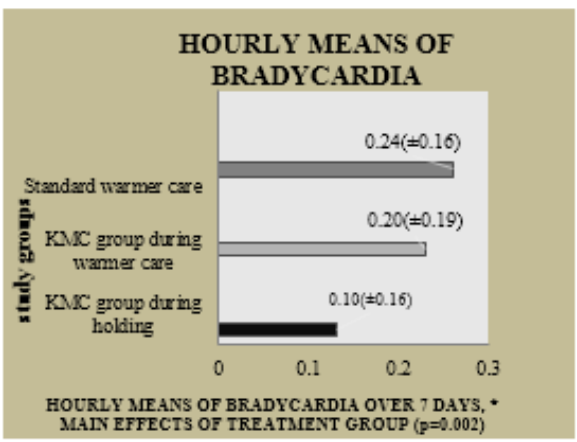
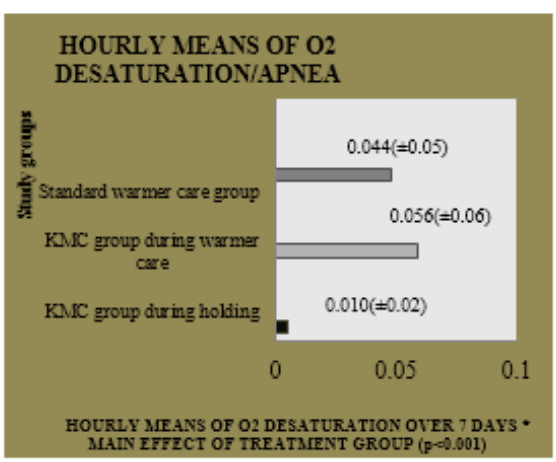


TABLE 2: Hourly means of O_2 desaturation/apnea



DISCUSSION-

KMC is a simple and low-cost intervention for the care of LBW/ preterm infants. It enhances both infant and maternal well-being and can be practiced in any situation without needing special equipment. Although initially conceived for use in developing countries with limited resources, its use has expanded worldwide as caregivers, parents, and administrators become increasingly familiar with the physiological, psychological, and cost benefits associated with the practice. [10, 11, 12]

Our study results are in agreement with the studies done earlier. Ludington-Hoe et al. have reported that kangaroo care promotes stability of physiological function [13]. In their study, [14] heart rate and respiratory rate remained stable, and apnea episodes did not occur during KMC.

There was distinct improvement in oxygen saturation during the KMC sessions. This is relevant for sick newborns, particularly those requiring oxygen supports. Earlier studies also report decrease in apnea and improvement in oxygen saturation in mechanically ventilated babies able to tolerate transfer and position changes [15, 16].

A meta-analysis of 23 studies of 190 term and 326 preterm infants (gestational age 26 to 36 weeks) concluded that there was no change in heart rate, and a statistically but not clinically significant decrease in oxygen saturation during periods of skin-to-skin contact [17]. Prematurity did not affect the stability of these parameters. Our study found a statistically similar significant rise in heart rate, and a definite improvement in oxygen saturation. These improvements are unlikely to have been due to chance alone since similar improvements were noted on all 7 days.

The reasons behind the beneficial effects of KMC are yet to be fully explored. During KMC, the infant experiences maternal heart sounds, rhythmic maternal breathing, warmth and prone positioning, all of which offer gentle stimulation across auditory, tactile, vestibular, and thermal sensory systems, which may in sum total have a tranquilizing effect on the baby, allowing physiological parameters to stabilize [18].

CONCLUSION:

KMC reduces bradycardia, apnea and oxygen desaturation events in preterm infants, providing physiological stability and possible benefits for neurodevelopmental outcomes [19]. KMC has many benefits that include stabilisation of cardio-respiratory system, thermoregulation and a higher incidence of exclusive breastfeeding. Care of LBW babies represents a major challenge for the health and social systems globally. There is considerable evidence from randomized control trials on the beneficial effects of Kangaroo Mother Care (KMC) from developing as well as from developed countries. Despite many advantages of KMC; it is still not widely practiced method of care of LBW neonates in India[20].

Volume : 4 | Issue : 12 | December 2015 • ISSN No 2277 - 8179

REFERENCE

[1] J. Standley, "Kangaroo mother care implementation guide. Washington (District of Columbia): Maternal and Child Health Integrated Program," 2011, http://www.mchip.net/sites/default/ files/MCHIP%20KMC%20Guide.pdf. | [2] M. S. Kramer, "Intrauterine growth and gestational duration determinants," Pediatrics, vol. 80, no. 4, pp. 502–511, 1987. | [3] S. Petrou, "The economic consequences of preterm birth during the first 10 years of life," BJOG: An International Journal of Obstetrics and Gynaecology, vol. 112, no. 1, pp. 10–15, 2005. | [4] J. N. I. Dieter and E. K. Emory, "Supplemental stimulation of premature infants: a treatment model," Journal of Pediatric Psychology, vol. 22, pp. 281–295, 1997. | [5] R. Feldman and A. I. Eidelman, "Intervention programs for premature infants: how and do they affect development?" Clinics in Perinatology, vol. 25, no. 3, pp. 613–626, 1998. | [6] A. Conde-Agudelo, J. M. Beliz´an, and J. L. Diaz-Rossello, "Kangaroo mother care to reduce morbidity and mortality in low birthweight infants (Review)," The Cochrane Library, vol. 3, 2011. | [7] E. Rey and H. Martinez, Manejo Racional del Nino Prematuro, Universidad Nacional, Cursod eMedicina Fetal, Bogota, Colombia, 1983. | [8] G. C. Anderson, "Current knowledge about skin-to-skin (kangaroo) care for preterm infants," Journal of Perinatology, vol. 11, no. 3, pp. 216–226, 1991 | [9]. Ludington-Hoe SM, Hadeed AJ, Anderson GC. Physiological response to skin to skin contact in hospitalized premature infants. J Perinatol.1991; 11: 19-24 | [10]Thukral A, Chawla D, Agarwal R, Deorari AK, Paul VK. Kangaroo mother care - an alternative to conventional care. Indian J Pediatr 2008;75:497-503. | [11].Hendricks-Muñoz KD, Li Y, Kim YS, Prendergast CC, Mayers R, Louie M. Maternal and neonatal nurse perceived value of kangaroo mother care and maternal care partnership in the neonatal intensive care unit. Am J Perinatol 2013;30:875-80. | [12].Pallás-Alonso CR, Losacco V, Maraschini A, Greisen G, Pierrat V, Warren I, et al.; European Science Foundation Network. Parental involvement and kangaroo care in European neonatal intensive care units: A policy survey in eight countries. Pediatr Crit Care Med 2012;13:568-77. | [13.]Ludington-Hoe SM. Evidence-based review of physiologic effects of kangaroo care. Curr Womens Health Rev 2011;7:243-53. | [14].Ludington-Hoe SM, Anderson GC, Simpson S, Hollingsead A, Argote LA, Rey H. Birth related fatigue in 34-36-week preterm neonates: Rapid recovery with very early kangaroo (skin-to-skin) care. J Obstet Gynecol Neonatal Nurs 1999;28:94-102. | [15].Cleary GM, Spinner SS, Gibson E, Greenspan JS. Skin-to-skin parental contact with fragile preterm infants. J Am Osteopath Assoc 1997;97:457-460. Back to cited text no. 16. | [16].Hunt F. The importance of kangaroo care on infant oxygen saturation levels and bonding. J Neonatal Nurs 2008;14:47-51 | [17].Mori R, Khanna R, Pledge D, Nakayama T. Meta-analysis of physiological effects of skin-to-skin contact for newborns and mothers. Pediatr Int 2010;52:161-70 | [18].Jefferies AL; Canadian Paediatric Society, Fetus and Newborn Committee. Kangaroo care for the preterm infant and family. Paediatr Child Health 2012;17:141-6 | [19]. Pillekamp F, Hermann C, Keller T, von Gontard A ,Kribs A, Roth B. Factors influencing apnea and bradycardia of prematurity - implications for neurodevelopment.Neonatology 2007;91 (3):155-61 | [20]. Meherban Singh. Temperature regulation, In care of newborn. Ed Meherban Singh. 5th Edition, New Delhi: Sagar Publications. 2000; 190-7. |