

## Review Article

# Kangaroo mother care review article

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### ABSTRACT

In spite of so many available health facilities, humans are unable to prevent preterm deliveries may be because of evolution process for increasing intelligence in Human species. Now a days most of the preterm babies are surviving due to antenatal steroid coverage, with advancement of health care facilities. As authors are unable to replace the nature and create in utero environment, Kangaroo mother care is a simple but most effective way of developmental supportive care. Here baby is exposed to some known and similar environment like in utero. Preterm survival without morbidity and com-promised quality is an important than survival alone. As preterm organs are still in a developing stage particularly central nervous system where organization, synapse formation still occurring hence enriched environment is necessary for optimal development. In kangaroo care baby usually meet enriched environment, here authors are giving a brief review of Kangaroo Care because of more evidence was there but still not practicing fully in many centers where needed particularly in developing countries. That's why authors are adding from their side.

**Keywords:** Developmental supportive care, Kangaroo mother care, Neonate, Preterm delivery

### INTRODUCTION

In India KMC was first introduced in 1994 at BJ Medical College Hospital, Ahmedabad. WHO formally endorsed KMC in 2003 and published KMC practice guidelines.

Kangaroo care is a natural form of human care. It was named for the similarity to how certain marsupials carry their young (compared to other animals' kangaroo invariably delivers premature baby that's why nature created a pouch to them). Kangaroo Mother Care (KMC) is a simple method of care for low birth weight babies. This includes early, prolonged and continuous skin-to-skin contact with the mother (or any caregiver) and exclusive, frequent breastfeeding (optimal feed-ing). KMC is one of the best types of development of supportive care as it satisfies all senses. The baby feels mother's warmth through skin-to-skin contact (touch), vestibular stimulation through the mother respirations, listens to mother's voice and heartbeat (hearing, known

sound in utero), sucks breast milk (taste), has eye contact with mother (vision, usually preterm are myop-ic, usually develops last) and smell- mother's odour (olfaction). Touch, balance, taste, smell, hear-ing, sight (by order of development) all senses are stimulated by KMC. As touch is the first sense to be developed so KMC is utmost important development supportive care at birth than others. In the microscopic roundworm *Caenorhabditis elegans* also physical interactions with other worms promote growth and increase adult responsiveness to mechanosensory stimuli. Authors observed inef-fable effects within hours of KMC like well ness of child and mother.

### REVIEW OF LITERATURE

Peter de Chateau in Sweden first described studies of "early contact". Kangaroo Mother Care (KMC) was first suggested in 1978 by Dr Edgar Rey in Bogotá Colombia as a crisis management, as high admission rate and less

infrastructure were available. Now WHO has suggested KMC as a standard of care in Developed countries also.<sup>1</sup> In the year 1998 Bogota declaration was :“KMC is basic right of the newborn ,it should be an integral part of the management of low birth weight and full term infants in all settings, at all levels of care and in all communities”. Kangaroo nutri-tion is an exclusive breastfeeding whenever possible. Kangaroo discharge is mother will have able to continue KMC practice at home. Kangaroo support is health care staff should provide support to mother to take care of her infant in the hospital and family should support to mother in practicing KMC at home. WHO has defined KMC as early, continuous and prolonged Skin-to-Skin Contact (SSC) between the mother and preterm babies; exclusive breastfeeding or breast milk feeding; early discharge after hospital-initiated KMC with continuation at home; adequate support with follow-up for mothers at home.<sup>2</sup>

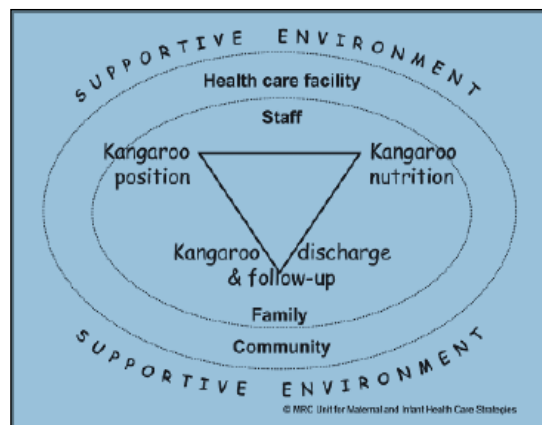
There was more evidence regarding the benefits of KMC for the baby, mother and society.

In 2010, a meta-analysis of 15 KMC studies showed a significant reduction in neonatal mortality (relative risk 0.49, 95% CI 0.29-0.82) and morbidity. Increased Weight gain (MD 4.1g/d 95% CI 2.3-5.9) Length (MD 0.21 cm/week 95% CI 0.03-0.38), Head circumference (MD 0.14 cm/week 95% CI 0.06-0.22) occur in KMC babies.<sup>3</sup> KMC babies will usually discharge early (27.2+/-7 days vs34.6+/-7days).<sup>3</sup> Neonatal mortality will decreased after KMC, (recent Cochrane review also showed reduction in mortality, RR 0.60;95% CI 0.39-0.92).<sup>4</sup> Less Stress noticed in KMC ba-bies confirmed by decreased levels of cortisol in saliva. Crying times are significantly less for pre-term infants during KMC than when in incubators.<sup>5</sup> Reduction of pain with KMC is definitively known from many randomized controlled or randomized cross-over trials. KMC minimized heel stick pain.<sup>6</sup> Higher Cholecystokinin levels observed in neonates who received KMC, stimulating the digestion of fat and protein.<sup>7</sup> Better organization of brain as synapses will continue form in preterm due to physiological enriched environment.<sup>8</sup> Decreased risk of developmental delay, better development in the first 24 months of life benefits till adolescence and beyond observed in babies who gone through KMC during infancy.<sup>9</sup> Better infant bonding noticed between mother and baby up to childhood.<sup>10</sup> In rats after tactile sensation about 30 minutes FGF-2 is produced in the skin, but can pass the blood-brain barrier, where it is hypothesized to stimulate synaptic changes.<sup>11</sup>

## DISCUSSION

As mentioned earlier there was lot of evidence about benefits of KMC but not practicing completely, Average duration of KMC varies from 3-5 hrs/day in previous Indian studies.<sup>12</sup> Discussed about how to increase the duration and authors experience in KMC purpose is spread. The components of KMC are skin-to-skin contact and exclusive breastfeeding (Figure 1). The pre-requisites

of KMC are support to the mother in hospital at home and post-discharge follow up. All hemodynamically stable LBW babies are eligible for KMC, it can be given in term babies also. Kangaroo Mother Care can be initiated in a baby who is otherwise stable but may still be on intravenous fluids, tube feeding and/or oxygen and even on CPAP/ventilator. Mother should have willingness; her general condition of health and nutrition should be good. Mother should maintain hygiene. Supportive family and community usually needed. Depending upon hemodynamic stability as early as possible authors can start. In stable babies’ authors can start immediately after birth. Babies with 1800 g or more weight babies usually stable at birth so authors can start immediately. Less than 1200 g babies usually take time to stabilize here authors can start intermittent KMC after stabilization. Between 1200-1800 gm babies depending on the baby condition usually it takes hours to days. When mother is not available, other family members such as father, grandmother or any other relative can provide KMC. (Any time, anyone, any place).



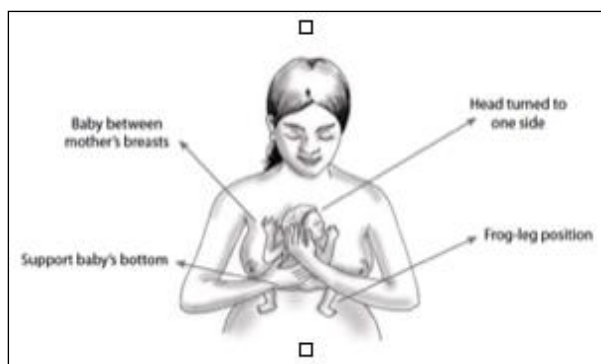
**Figure 1: Components of KMC.**

KMC can be provided using any front-open, light dress as per the local culture. KMC works well with blouse and sari, gown, front open kurta, shirt or shawl. Baby should be dressed up with cap, socks, nappy and front-open sleeveless shirt (depending upon environmental/ room temperature). If mother want to work, a suitable dress, support binder, carrying pouch (depending on the institution) that can retain the baby for extended period of time used usually. It can be adapted locally, or authors can made with simple cloths also. Better to avoid tightness over the baby abdomen (not to hinder the baby respirations), upper part of cloth should cover the ears to prevent the slipping of baby head.

Requirements for KMC implementation are Nurses, physicians and other skillful staff (Health professionals should be skilled for providing immediate emergency care, in case re-quired), educational material in the form of information sheets, posters and video films on KMC, furniture (optional) like Semi-reclining easy chairs, beds with adjustable back rest. Counselling to motivate the

mother, family and support group. Privacy is necessary (mother may demotivate due to lack of privacy). Room temperature of 25-28C, 50-60% relative humidity is generally needed for prolonged period of KMC, to decrease the mothers stress and to prevent the hyperthermia in babies.

Baby should be placed between the mother's breasts in an upright position, head should be turned to one side (to breath) and in a slightly extended position (sniffing position). This slightly extended head position keeps the airway open and allows eye to eye contact between the mother and her baby (initiate letdown reflex). Hips should be flexed and abducted in a "frog" like position; the arms should also be flexed. Baby's abdomen should be at the level of the mother's epigastrium (better to take care of diaper as it may hinder skin to skin contact) (Figure 2). Mother's breathing stimulates the baby thus reducing the occurrence of apnea. Support the baby's bottom with a sling/binder. Mother can sleep /work during KMC. KMC duration usually minimum one hour (frequent handling is more stressful to the baby), maximum 24 hrs per day. KMC duration usually increased by identifying the problems in policy, procedure, people and place and to be corrected by repeated PDSA cycles. Allowing family members including male members during night for do-ing KMC, making KMC policy as an integral part of treatment order, introducing the concept of weekly KMC champions, decreasing the anxiety of mothers by proper counselling, decreasing the duration of milk expression by increasing availability of breast pumps and space can increase the duration of KMC. Other simple measures such as positive reinforcement and felicitation have the potential to improve KMC duration.



**Figure 2: KMC Position.**

Ensure that baby's neck is not too flexed or too extended, breathing is normal, feet and hands are warm and pink during KMC. Dangers signs were difficulty in breathing ,chest in drawing, grunting, breathing very fast or very slowly, frequent and long spells of apnea, cold baby, difficulty in feeding, convulsions, diarrhoea and yellow skin. Reassurance on sneezes or has hiccups; passes soft stools after each feed; does not pass stools for 2-3 days. Intermittent KMC is Initiated during recovery with

ongoing medical treatment in level 3 and 2 and continuous KMC usually done Discontinuation usually done-until baby become uncomfortable (wriggling out, pulls limbs out, cries and fusses), generally up to 40 wks/2.5 kg. Any follow up usually depends upon the confidence, socioeconomic and education of parents/caregiver. First visit to be early. But generally Once or twice a week till 37-40 wks/ 2.5-3 kg. Thereafter, once in 2-4 wks till 3 months chronological age. Subsequently, every 1-2 months during first year. More frequent visits if baby is not grow-ing well (<15-20 gm/kg/day up to 40 weeks post-conceptual age and then <10 gm/kg/day). Record keeping is important. Authors observed many babies with feeding intolerance, oxygen retirement will normalized within hours and days.

Effective Thermal control will occur during KMC, the temperature of infant receiving KMC is slightly higher than infant in incubator, mother temperature will rise 2C to keep the baby warm. Increased Breastfeeding rates noticed in KMC neonates; many babies reach complete breast feeding at 35wks (as reflex can be accelerated). Less Morbidities such as apnea because baby persistently stimulated by mother respirations. Less infections, due to mother commensal colonization of baby and formation of antibodies by mother to the environmental bacteria and viruses. As humans are emotional, social animals' attachment is core thing for happy and healthy life. Gathwala and colleagues explored the total attachment score (24.46±1.64) in the KMC group was significantly higher than the control group (18.22±1.79, p<0.001).<sup>13</sup> Mothers practicing KMC feel more competent than others some people called as resilience effect.<sup>14</sup> Authors observed cheerful, smily mother faces after two to three days of KMC, derived greater pleasure from their babies. (some hypothesis need not be tested?). Cost effectiveness is the major advantage, needs no study. If father involved in KMC there is less chances of child abuse. Mother insular cortex release oxytocin during KMC causes involution of uterus, let down reflex is more activated during KMC. glucose stabilization and better digestion (due to cholecystokinin) observed in both mother and baby. Adequate milk usually occurs due to more prolactin release during KMC. In-cresed confidence in parents and deep satisfaction will occur after long duration of KMC. The effect of KMC immediately after birth before stabilization is unclear due to inconclusive evidence, define stability is needed through further studies or by consulting experts through a Delphi method. Kangaroo mother care transport is considered as a safe, effective and inexpensive method of transport. KMC is as good as transport incubator in transporting physiologically stable preterm neonates. Better action plan taken to advocate KMC to be practiced for all infants eligible for KMC at public health facilities.

**Recommendations**

Each health facility implementing KMC services should have a written policy and guidelines that are based on

national documents and adapted to its specific level of health care. Many studies need to be done in areas like: the effectiveness and safety of KMC before stabilization (i.e. without incubators and other expensive technologies); simpler and reliable methods for monitoring the well-being of KMC infants, especially breathing and feeding; KMC in LBW infants weighing less than 1000g, and in newborn infants who are critically ill; KMC in very special circumstances, e.g. in very cold climates or in refugee camps; cultural and managerial barriers that may hinder the implementation of KMC, KMC in difficult extubation babies and in ill term babies. A central and accessible database needed to analyze the data, simple measurement tools to measure and evaluate KMC needed. Researchers and program implementers can contribute to building a more solid evidence base for KMC.

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