A Kangaroo Mother Care research study: a work in progress

Kangaroo Mother Care is a method of preterm infant care which involves skin-to-skin contact between caregiver and infant. The programme emerged out of necessity in Bogota, Colombia to compensate for a lack of medical equipment, but is progressively becoming routine practice in London hospitals to foster the development of the mother-infant and father-infant relationship. A Bliss-funded research project is being carried out to analyse the psychological effects that this method of care has on both the parents and their preterm infants.

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Key points

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The Kangaroo Mother Care Research Study aims to establish the long-term effects KMC has on:

- The interaction and bonding between the infant and the parents.
- The psychological well-being of the parents.
- The infant's cognitive, motor and behavioural development.

Newborn care has greatly benefited from major technical advances in the last four decades, showing substantial improvements in the mortality and morbidity of the high-risk neonate[1]. In addition, there has been a heightened awareness of the psychological and emotional burden encountered by the parents of the premature neonate. From birth, primary care for the infant is transferred from the mother to the professional caregivers of the neonatal unit. Moreover, for the infant, the neonatal unit can often be an environment of both sensory overload and deprivation, where the infant receives at times too much or too little stimulation. Such experiences may have a negative impact on mother-infant interaction and bonding[2-4], on the infant's development, and on the psychological well-being of parents and infant[5].

Kangaroo Mother Care (KMC) is a type of care for preterm infants and their parents that provides early skin-to-skin contact between the baby and the parents. This method enables parents to provide primary care and comfort to their child during their time in hospital[6]. Much of the research that has been carried out on KMC since it was initiated has focused on physiological effects, while the psychological effects of KMC remain understudied. The KMC Research Project in the North Central London Perinatal Network, funded by Bliss principal investigator Professor Maria A. Tallandini, aims to fill this gap by investigating some of the psychological effects of KMC, specifically in an English context.

Kangaroo Mother Care

KMC is defined as a practice in which the premature infant is placed in an upright position against the parent's chest[7], such that there is skin-to-skin contact between the parent and infant. The infant is naked, except for a nappy, socks, and a cap. Since this method relies on such a particular physical arrangement between the mother and infant, it can be initiated only when both are physiologically stable (**FIGURE 1**).

FIGURE 1 Kangaroo care in practice.

History

Dr Edgar Rey originally started KMC in 1978 in Bogota, Columbia as an alternative to traditional incubator care for low birthweight infants, because of the overcrowding and scarcity of resources in his country's hospitals[8,9].

It has since been demonstrated that,

from a physiological point of view, the KMC procedure does not increase the risk of mortality for premature infants[10-13]. On the contrary, it provides a physical environment that is as safe for the infant as the incubator[8].

Literature review

Previous research has demonstrated that the physiological development of infants who receive KMC is advanced compared to that of infants receiving the traditional method of care. Infants who have received KMC are found to:

- spend more time in quiet sleep[14]
- have a lower and more stable heart rate[14]
- suffer less from apnoea and bradycardia[15]
- be better able to maintain body temperature and oxygen saturation[15-19]
- experience an analgesic effect during painful medical procedures[20]
- have faster growth rates and are discharged from hospital earlier[21].

The literature has also shown that the impact of KMC is not limited to the hospitalisation period. In fact, following discharge from hospital, KMC has a positive impact on breastfeeding[12, 22-28], crying[29], the sleep-wake cycle and arousal[29], and on the infant's overall development during the first two years of life.

Other studies have demonstrated the impact of KMC on both the mother-infant relationship and on the mother's psychological well-being. Mothers who practise KMC reported more positive feelings towards their infant[30], perceiving their infant to be less abnormal[31]. The mothers exhibit less maternal stress[32], fewer symptoms of depression[31], have a better sense of their parenting role[32], and feel more confident and competent in meeting their baby's needs[33,34]. Moreover, KMC infants are more alert and responsive[31,32,34], and the parents have a more cohesive family style[35]. In contrast, two studies conducted in the UK found neither beneficial nor adverse effects of skin-to-skin contact after preterm birth on maternal psychological well-being[29,35] and infant development. However, in these studies, KMC was recommended for only 30 minutes a day. This is only half of the standard 60 minutes a day, which seems to be the minimum time period for obtaining beneficial results[29,30].

The study

KMC is rapidly spreading as an intervention practice in the UK. Whereas KMC in the developing world is often used as a solution to a shortage of equipment, it is adopted in the developed world primarily as a means to promote psychological well-being. The present study of KMC practice in the UK commenced in June 2006. The study is a multi-site project being carried out at The Elizabeth Garrett Anderson, Barnet, Whittington, and Royal Free Hospitals, which are part of the North Central London Perinatal Network.

FIGURE 2 A mother uses a mirror to check her baby in the KMC position.

The aims of the research project are to establish the effects of KMC during the first year of the infant's life. The areas considered are:

- the interaction between the infant and the parents
- the psychological well-being of the parents
- the parents' relationship
- the infant's cognitive, motor, and behavioural development.

The study will involve in total 100 preterm infants and their parents, half of them receiving KMC and the other half receiving traditional care. Infants are eligible to be recruited for the study if they weigh less than 2000g at birth and their gestational age is less than 37 weeks. Moreover, for skin-to-skin contact to be possible, they need to be physiologically stable. Infants with major congenital malformations and parents with a psychopathological history are excluded. The control variables considered are: type of delivery, CRIB II, sex, parity (singleton versus twins), maternal and paternal age, education, ethnicity, occupation, and number of children.

In order to implement KMC intervention in the neonatal units, appropriate guidelines for the medical staff were developed, following the WHO guidelines. An information sheet on KMC was also created for the parents. The implementation of KMC is supported by a KMC-trained nurse who provides teaching seminars and one-to-one sessions with parents and nurses. The decision about suitability for KMC is made by the medical team. KMC is initiated with infants from 32 weeks on average (ranging from 28-36 gestational weeks). Parents are provided with a binder to secure the baby on the chest, a mirror to observe the neonate in the KMC position, and a diary to register the KMC sessions. They provide KMC seated comfortably in a chair beside the infant's incubator.

The research intervention recommendation was to apply KMC for at least 60 minutes per day for 14 consecutive days. Participation is voluntary and parents may withdraw from the study at any time (**FIGURE 2**).

In order to assess the psychological, relational, and behavioural impact of KMC, data on the relevant psychological variables are collected by means of standardised self-report questionnaires, video recordings of parent-infant interaction, and the Bayley's developmental assessment in the first year of the infant's life at home and in follow-up clinics. In particular, the psychological well-being of the parents is assessed by their degree of anxiety, parental stress and presence of symptoms of depression. The parents-infant relationship is assessed by evaluating their bonding towards the infant and their perception of their own infant in comparison to an average infant. The parents-infant interaction is evaluated by observing the dyads during feeding time and play sessions. The parental couple relationship is assessed by measuring their marital satisfaction, parenting alliance and their perception of social support received. Finally the infant's cognitive, motor, and behavioural development is assessed by the use of a standardised developmental scale.

Data is collected at various stages of the infant's life: upon entrance into the study, at discharge from hospital, as well as at 3 months, 6 months, 9 months, and one year

corrected gestational age.

The 6 months' participants follow-up, which has been funded by the grant from Bliss, is scheduled to end in February 2009. Further data collection up to the one year follow-up is planned, but this is subject to finding financial support for the research.

Conclusion

This study will provide psychological and behavioural data on the long-term effects of KMC that have not yet been systematically investigated.

More broadly, this research analyses an intervention practice aimed at helping preterm babies and their parents. The practice involves active parent participation from the earliest stage of infant life, when the absence of contact has heretofore been considered unavoidable. As one mother participating in our research states:

> "KMC is the part of my baby's healing process that only we can do for her. It's a crucial bonding experience and it reassures us that she's our baby – not the hospital's. It also is a time that we allow ourselves to think to the future and bringing her home, which is a massively reassuring sentiment, during this difficult time of our lives as a family."

Useful resources for KMC

- Kangaroo Care Studies at University College London – Prof Maria A. Tallandini, Dr Angela Huertas-Ceballos, Lucia Genesoni, Robyn LeighCurran, Laura Gottardis: www.kangaroocare.ucl.ac.uk
- Kangaroo Studies at University of Trieste, Italy – Prof Maria A. Tallandini: www.psico.univ.trieste.it/labs/tallandini/kangaroo.html
- International Network for Kangaroo Mother Care (INK) – Dr Charpack: kangaroo.javeriana.edu.co
- KMC's promotion, from Mowbray Maternity Hospital, Cape Town, S Africa – Dr Bergman: www.kangaroomothercare.com
- Kangaroo Care Studies at Bolton School of Nursing, Cleveland USA – Dr Ludington: fpb.case.edu/KangarooCare/index.shtm
- Kangaroo Mother Care Initiative, India www.kmcindia.org/healthcare/index.html
- Bliss, the special care baby charity, www.bliss.org.uk

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