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Experiences in Kangaroo Mother Care in Five Latin American Countries

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LETTER OF INTRODUCTION

It is my pleasure to present the following synthesis of Kangaroo Mother Care (KMC) programs implemented in Nicaragua, Guatemala, El Salvador, Honduras, and Ecuador, supported by the USAID Health Care Improvement Project (HCI). This report describes the experience of each of these countries in the development and implementation of a Kangaroo Mother Care program. The report also includes observations, lessons learned, and areas for further research. This effort by HCI began in January 2010 at the request of the United States Agency for International Development (USAID). USAID invited HCI to support the introduction and expansion of Kangaroo Care programs in the five countries, working first with a large teaching hospital in each country and later expanding the effort to other hospitals. It is HCI's pleasure to support the Ministries of Health and hospital implementation teams throughout this process. HCI provides technical assistance to these partners to support the implementation and scale-up of KMC programs through all phases.

The KMC method reduces hypothermia and infections in premature and low birth weight newborns, and promotes weight gain through breastfeeding. The method offers a low-cost, low-technology alternative and is highly effective compared with conventional care for these newborns. KMC is beneficial for the whole family unit, as it helps form an emotional bond between parents and baby. It is also beneficial for hospitals: a KMC program is less costly than maintaining incubators, lowers the probability of readmission, and reduces the average duration of stay in the hospital.

Kangaroo Mother Care is an important strategy to address prematurity and low birth weight, and supports better health outcomes for newborns. HCI works with medical staff, hospitals, and the Ministries of Health to reduce neonatal mortality through quality improvement activities for essential newborn care. HCI employs a variety quality improvement approaches that respond to distinct needs of countries and programs. HCI also supports the expansion of the Helping Babies Breathe curriculum to prevent neonatal asphyxia in these countries. Together, these activities reduce neonatal mortality and morbidity.

HCI thanks the Ministries of Health in the five countries, the Kangaroo Foundation of Bogotá, Colombia, the hospital implementation teams, the staff and management of each participating hospital, and the HCI teams in each country. Their hard work and dedication has led to the success of the Kangaroo programs in these countries, and will lead to important reductions in neonatal mortality.

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Abbreviations

CHS	Center for Human Services
DGECA	Directorate for the Extension of Quality Care (Nicaragua)
HBC	Bertha Calderón Hospital
HCI	USAID Health Care Improvement Project
INSS	National Society Security Institute, Ecuador
KMC	Kangaroo Mother Care
MINSA	Ministry of Health, Nicaragua
MINSAL	Ministry of Health, El Salvador
MSP	Ministry of Public Health, Ecuador
MSPAS	Ministry of Public Health and Social Support, Guatemala
PAHO	Pan American Health Organization
SSH	Secretariat of Health, Honduras
URC	University Research Co., LLC
USAID	United States Agency for International Development

NICARAGUA

Initial engagement with MINSA and plan for the introduction of KMC

HCI Nicaragua first engaged with the Directorate for the Extension of Quality Care (DGECA) of the Ministry of Health (MINSA) in March 2010. Initially, Kangaroo Mother Care (KMC) was promoted as a way to reduce neonatal mortality among premature and low birth weight babies, a significant public health problem in the country. To gain support for the idea, HCI shared scientific articles and information from the Kangaroo Care Foundation in Bogotá.

Hospital and staff selection

MINSA selected Hospital Bertha Calderon (HBC), a large national maternity hospital in Managua, to pilot the program; the hospital has the highest rate of prematurity in the country as it receives referrals from across Nicaragua. A team from the hospital was formed to attend training at the Kangaroo Foundation in Bogotá and lead implementation of the program at the hospital. The team included Dr. Nieves Sanchez, chief neonatologist, Concepción Vindell, the head neonatology nurse, and Brígida del Carmen Alvarado, a staff psychologist. Dr. Ivonne Gomez of HCI Nicaragua provided technical support.

Training in Bogotá

The HBC team, accompanied by HCI, attended a two week clinical training at the Kangaroo Foundation in Bogotá, Colombia in April 2010. The training focused on clinical aspects of KMC, including KMC in the ambulatory phase, and included site visits to local Kangaroo programs. It also included an orientation to the financial and administrative management of KMC programs to ensure sustainability and cost-effectiveness, as well as the role of social workers in a KMC program. The training was very interactive and practical, which promoted learning, but the training did not include content on implementation of a program. The training included one week on program implementation and management.

Preparing a program area at the hospital

HBC was fortunate to have a dedicated physical space at the outset of the program. The team procured comfortable chairs for parents, an electronic balance, supplies for patient registration, and Kangaroo belts, lycra belts that help hold the baby upright against the mother or father's chest, among others.

Preparing and training hospital staff

After training in Colombia, the HBC implementation team engaged in several tasks to promote the new KMC program. First, the team advocated for the method among staff and hospital management during meetings. There was much resistance to the new program, and this important step helped staff understand the goals and importance of KMC. The implementation team, with support from HCI staff, provided formal clinical training for other HBC staff on the KMC method. The nurse was responsible for training other nursing staff, while the doctor trained neonatologists and other doctors. Approximately 20 participants attended six group training sessions, each for four hours. Finally, the team developed and realized the implementation plan, provided support to all staff throughout the implementation, and began data collection.

When the program began, all medical staff from the Department of Neonatology were involved in providing care. Doctors identify candidate patients for participation in the KMC program, while nurses provide education to parents beginning the program. Each day, the doctor and nurse provide care from 7 am to 3 pm. After these hours, the doctor and nurse on call support the program, highlighting the importance of training all staff in KMC.

The HBC implementation team originally faced resistance from other staff. Some staff members worried that not bathing the newborn promoted poor hygiene, maintaining the baby in the Kangaroo position was dangerous, and that family members would not remain in the dedicated KMC

program room. The implementation team responded to these concerns with scientific evidence showing the advantages and benefits of the KMC method, and results of its impact on mortality and morbidity for premature newborns. Over time, through training and by seeing the results of the program, staff attitudes changed and today all Neonatology staff fully support the program. The implementation team has continued training and advocacy efforts for staff and MINSA to promote the KMC program and its advances.

Development of clinical guidelines and tools for providers
The HBC implementation team developed the following tools for staff:

- Manual for Premature Newborns (clinical management protocols for providers)
- Informed consent
- Clinical intake forms
- Manual for Kangaroo Parents (education materials for families participating in the KMC program)

Technical criteria for admitting patients to KMC and discharging
To enter the program, a newborn must be younger than 37 weeks, weigh less than 2000 grams, and be in clinically stable condition and breathing without a ventilator. The family must be dedicated to the program and motivated to participate. The mother or family member providing support may not have any skin conditions that might affect the baby. For discharge, patients must weigh at least 1600 grams, be clinically stable, and meet other social and psychological criteria as determined at the baby's discharge evaluation.

Parent and family education
Each family signs an informed consent prior to beginning the program. Parents and families participating in the KMC program are trained in the method at intake by a program nurse. There are also daily educational chats ("charlas") in the program, which cover topics related to newborn feeding and care. The staff psychologist meets with families once a week.

The hospital designed entry identification cards for parents participating in the program so that they could quickly access to the Neonatology Unit at the hospital.

Monitoring and evaluating the KMC intervention
HBC uses the following indicators for the KMC program:

- % of newborns entering the program
- Average number of days in the program
- Average daily weight gain
- % compliance with care protocols

Intake and discharge dates, weight gain, and compliance with care protocols are recorded daily in individual patient charts on a sheet designed for the KMC program. At discharge, nurses and doctors enter these data into a master database for analysis.

KMC in the ambulatory phase
HBC recently began support for KMC in the ambulatory phase. HBC staff make referrals and coordinate with local health units, who provide follow up for newborns from outside Managua. Newborns from Managua return to the hospital and are seen by a Neonatology staff member for follow up care after graduation from the program.

Results of applying KMC
Through the end of October 2011, 302 newborns participated in the KMC program at Hospital Bertha Calderon since it began in September 2010. Over the course of the past year, the average hospital stay for babies participating in the KMC program has been reduced by 50% from 45-60 days

before the program to 17-30 days after program implementation. In FY11, 77% of premature babies at HBC participated in the KMC program. 95% of KMC babies are breastfed exclusively.

The preliminary results of a cost-effectiveness analysis of Kangaroo Care at HBC over a six month period shows that the KMC program saved money and improved the health of newborns.

Scale up to other hospitals

MINSA has designated the Amistad Japón Nicaragua Hospital in Granada as the next hospital in Nicaragua to implement a KMC program. The implementation team from HBC will train providers at this hospital in the KMC method. The program should open within a few months. In the coming year, HCI and MINSA will work to promote the KMC method nationally, and are in the process of writing official MINSA norms and protocols for use across the country.

GUATEMALA

Initial engagement with MINSA and plan for the introduction of KMC

HCI approached the Vice Ministry of Hospitals within the Ministry of Health (MSP) to gain support for the design and implementation of a Kangaroo Mother Care program in Quetzaltenango. The MSP was already familiar with Kangaroo Mother Care (KMC) as several independent programs had already been implemented in three hospitals in Guatemala City, so it was not difficult to advocate for this approach to care for premature and low birth weight newborns. No KMC programs had been implemented in Quetzaltenango, Guatemala's second largest city.

Hospital and staff selection

The Western Regional Hospital in Quetzaltenango was chosen for implementation. This large teaching hospital receives patients from across the western region of Guatemala, and has a neonatal intensive care unit that provides care for a high number of low birth weight and premature newborns. The hospital had not had a KMC program previously. Within the hospital, a three person team was chosen to lead implementation: Dr. Roberto Godínez, a neonatologist; Lilian Miranda, neonatal nurse; and Silvia Ortiz, psychologist. Dr. Gustavo Batres, Hospital Modernization Coordinator of the Vice Ministry of Health, supported the team in program management and implementation activities.

Training in Bogotá

The team from Western Regional attended a two week clinical training at the Kangaroo Foundation in Colombia. Dr. Batres and Dr. Bernarda Méndez of HCI attended a one week training on KMC program management. The team completed several field visits to hospitals in the area with KMC programs, including one with a population of low socioeconomic status similar to the patient population served by the Western Regional Hospital. The visit to this hospital's program was especially valuable for the Western Regional Hospital team.

Preparing a program area at the hospital

The Western Regional Hospital arranged for two rooms with three beds each for the new KMC program. The team found it challenging to secure a designated program area at the hospital, but in addition to the two rooms, the program shares space with the Breastfeeding Clinic to provide ambulatory KMC care. The team was able to procure the necessary supplies for the program, including digital balances; medical equipment, including stethoscopes, thermometers and oximeters; office equipment and a computer; donut pillows to support breastfeeding; and medications. However, the team has had some challenges in procuring some medications due to stock outs at the network level.

Preparing and training hospital staff

After returning from Bogotá, the implementation team trained other Western Regional Hospital staff following guidelines established by the Kangaroo Foundation. Staff that rotate through the KMC program, including residents and students, have received training in the KMC method through two one hour orientation sessions. The implementation team also gave training talks to the Neonatology nursing staff. Staff at the hospital were supportive of the KMC method and program from its introduction.

The KMC program is staffed by the nurse, neonatologist, and psychologist, as well as a first year pediatrics resident. The nurse works with the program full time. Both nurses and doctors complete intake and provide follow up care for the program. However, the hospital has found that this is not sufficient: the neonatologist does not exclusively work with the KMC program, and residents rotate among all pediatrics services and are not yet skilled in neonatal care. The psychologist is also not exclusive to the KMC program; due to the high workload for the Psychology Department, she is not able to spend a significant amount of time with the program.

The program is supported by other specialists, including pediatric cardiology, pediatric neurology, physical therapy, orthopedics, nutrition, and lactation consultants.

Development of clinical guidelines and tools for providers
The hospital developed intake and discharge criteria for patients as described below. The team developed a follow up sheet with growth charts for each patient, as well as patient identification cards.

Technical criteria for admitting patients to KMC and discharging
To enter the program, newborns must be premature and/or low birth weight, more than 30 weeks, weigh at least 1350 grams, clinically stable, and not dependent on oxygen. Additionally, the baby must have already initiated breastfeeding and be non-anemic. Parents must be willing to comply with the requirements of the KMC program.

Patients are discharged when they weigh at least 1600 grams. Initially, the program discharged babies at 1400-1500 grams, but changed the criteria when some of these babies returned with respiratory infections. Recently, the program has begun to discharge some babies at 1500 grams as determined on an individual basis.

Parent and family education
Parents complete three to five days of training in the KMC method when their newborn enters into the program. The hospital found it was most effective to provide beds for families within the KMC program area as many of these families live very far from the hospital. Parents receive both group and individual education counseling. The education covers such topics as breastfeeding, newborn care and hygiene, and danger signs. Each family receives an information sheet developed by the hospital team.

Monitoring and evaluating the KMC intervention
The hospital team has not yet developed or begun collecting data on indicators because they have not been able to identify a secure area in the hospital to store a computer and database. However, the pediatric residents prepare a monthly statistical summary that captures intake and discharges, as well as length of stay. The program does plan to start collecting information on more indicators in the next months, including the database of indicators provided by the Kangaroo Foundation in Bogotá.

KMC in the ambulatory phase
The Western Regional Hospital began an ambulatory care program for KMC patients at the same time as the in-patient program. In ambulatory care, patients receive follow-up medical consults, growth and development monitoring, and immunizations. The program has not yet made links with outside facilities to provide this type of care outside the hospital, though these referrals will be made on an individual basis in the future.

Results of applying KMC
To date, 96 premature and low birth weight babies have participated in the intra-hospital and ambulatory KMC programs at the Western Regional Hospital, 31% of all premature babies at the hospital since the program's inception in July.

Scale up to other hospitals
While specific plans to expand KMC to other hospitals have not yet been developed, the Western Regional Hospital has been designated as a training center for other facilities. Many regional hospitals in Guatemala do employ the Kangaroo position and care for newborns even without a formal KMC program. HCI will continue to provide technical assistance to the Western Regional Hospital team to strengthen its KMC program and to develop training capacity, and plans to work with the MSP to institutionalize KMC.

EL SALVADOR

Initial engagement with MINSA and plan for the introduction of KMC

HCI first approached the Ministry of Health (MINSAL) in El Salvador in October 2010. A Kangaroo Mother Care (KMC) program had been implemented at two of the country's largest maternity hospitals in the 1990s after two doctors received training from the Kangaroo Foundation in Colombia, but without the necessary resources or support, the program failed. When HCI suggested the implementation of a strengthened KMC program, MINSAL reacted positively and supported the idea. From there, they worked together to outline a program and select a hospital and team to lead implementation. MINSAL's goal was to implement a KMC program at each of the three largest maternity hospitals in El Salvador, which have the highest number of premature births.

Hospital and staff selection

The National Maternity Hospital in San Salvador was selected to lead KMC implementation as it is the leading maternity hospital in the country and has the most births and premature newborns. It is a large teaching hospital and receives referrals from across the country. Within the hospital, an implementation team was designated to attend training in at the Kangaroo Foundation and build the KMC program in El Salvador. This team included Dr. Boris Alexander Carranza Robles, a neonatologist, Blanca Rosa Figueroa de Figueroa, a nurse, and Mirna Recinos de Rodriguez, a psychologist. Dr. Patricia de Quinteros of HCI and Dr. Judith Yanira Burgos of MINSAL also attended training at the Foundation to support program implementation and management.

Training in Bogotá

The team attended a two week clinical training in Bogotá in September 2010. This training included site visits to several Kangaroo programs, which the team felt strengthened their understanding of the KMC methodology and program management. Dr. Quinteros and Dr. Yanira Burgos attended a one week training at the Foundation that focused specifically on KMC program management.

Preparing a program area at the hospital

After training in Colombia, the National Maternity Hospital implementation team worked with general management of the hospital to select a room suitable for the KMC program. At the beginning of the implementation process, the team made a list of improvements and tasks that served as a guide throughout the program development phase. The physical space for the Kangaroo program is within the Neonatal Unit at the hospital.

To secure the necessary supplies, equipment, and medications, the team used HCI project funds to purchase items locally. These items included the Kangaroo Kit for families (lycra belt, shirt, cap, and socks), digital scales, stethoscopes, a computer, and exam table, among others.

Preparing and training hospital staff

After training in Colombia, the implementation team, including HCI and MINSAL, provided training to other hospital staff through several eight hour workshops. Nurses participated in three workshops, doctors in two workshops, and residents and other hospital staff in one workshop. While each workshop was tailored to the duties of its participants, the general content included advocacy of the KMC method, especially in the Salvadorean context; clinical orientation to the Kangaroo position, method, and protocols; psychosocial aspects of participation in the KMC program; demonstration of KMC techniques; and implementation of the program at the National Maternity Hospital. In the second phase of the program, the team will also provide training to medical students.

The KMC program is staffed for eight hours per day by the neonatologist and nurse trained in Bogotá. They are supported each day by an auxiliary nurse. When the program first began, it was only staffed for six hours per day, and the KMC staff still attended to other duties within the hospital. However, the team quickly realized that this was insufficient and was able to work with the

hospital management to expand coverage by two hours. The hospital management and the National Programs Director of MINSAL were willing to expand the coverage because the KMC program showed successful outcomes for premature and low birth weight newborns from its outset and was in high demand. Currently, there is no coverage during nights or weekends; the team hopes to expand coverage to these hours in the next phase of the program.

Each team member has a specific role within the program. The neonatologist provides intra-hospital and ambulatory check-ups for all patients, intake exams for new patients, and daily chart review for in-hospital patients. He also represents the KMC program to the hospital management and in hospital meetings, and writes monthly program reports. The nurses provide care, including hygiene, and support to all KMC patients, monitor weight, temperature and clinical status, and give educational chats to parents. At intake, the nurses orient newly admitted families to the KMC method. The psychologist provides group therapy sessions and education for families and conducts in-depth interviews with high-risk patients.

Development of clinical guidelines and tools for providers

The implementation team has developed several clinical tools for providers, which have also been shared with the two expansion programs at San Miguel and Santa Ana hospitals. These tools include a technical guide for providers, which details admission and discharge criteria and full care protocols for intra-hospital and ambulatory KMC programs. Additionally, the team developed several promotional materials for patients and families, such as an information brochure and a practical guide to KMC in El Salvador. The team created medical records for patients' files, which include a clinical evaluation record, clinical care record, and references for follow up. Indicators and registration information are collected and analyzed in a SPSS database that was created by the team. All parents participating in the KMC program sign an informed consent that was written by the implementation team.

Technical criteria for admitting patients to KMC and discharging

When the KMC program began at the National Maternity Hospital, premature and low birth weight babies were eligible to participate if they weighed at least 1300 grams, could breastfeed, and were clinically stable. Families must agree to the demands of the program, and have housing or lodging in the San Salvador area as the hospital is not yet able to provide lodging to participants. Since the program has begun, babies as small as 1100 grams have been admitted if they are clinically stable. Babies weighing between 1100 and 1300 grams are evaluated on a case by case basis.

To be discharged, an infant must weigh 1600 to 1800 grams, be able to breastfeed successfully, have adequate and sustained daily weight gain, and be clinically stable and healthy. Prior to discharge infants are given a sepsis test and urine culture, as well as an ophthalmology exam.

Parent and family education

Each family participating in the program receives training in the Kangaroo method and the KMC program on admission. A member of the KMC team conducts an interview with each family prior to intake to evaluate eligibility. As previously mentioned, each day the nurses give educational chats on newborn care and other issues relevant to Kangaroo care. The team plays several Kangaroo-care related videos that teach positioning and massage techniques. Educational brochures are also distributed to all participating families.

Monitoring and evaluating the KMC intervention

The National Maternity Hospital KMC team compiles indicators from patient files, including age, length of stay and weight gain. Additionally, the team collects information on feeding, ambulatory care, re-hospitalizations, average weight gain, average length of stay, and anthropometric measurements and gains. The team is still in the process of developing and collecting additional indicators. Indicators are compiled and analyzed by the KMC neonatologist on a monthly basis.

KMC in the ambulatory phase
Once a newborn is discharged from the intra-hospital KMC program, he or she participates in the ambulatory KMC program, in which he or she receives an exam every 48 hours until he or she has reached 40 weeks gestational age. At these appointments, the patient is examined and the program uses it as an opportunity to reinforce educational and care messages with parents and family members. It is also an opportunity to respond to any questions, difficulties or doubts from families.

When the newborn reaches 40 weeks, he or she is referred to a secondary hospital or primary health care center to receive follow up care for premature newborns. This program follows premature babies through three years of age, and will begin to follow children through age five.

Results of applying KMC
The National Maternity Hospital began to see patients in March 2011. As of September 2011, 127 patients have participated in the KMC program, with only ten patients abandoning the program. Before the program, the average daily weight gain was 25.8 grams/day; for KMC babies, the average daily weight gain is 41.9 grams/day. In the ambulatory phase, the average daily weight gain is as high as 75 grams/day. Since its inception, the program has seen a reduction of 110 liters of formula at the hospital due to increased breastfeeding among KMC patients.

Scale up to other hospitals
MINSAL, HCI, and the National Maternity Hospital implementation team have successfully begun to expand the KMC program to two regional maternity hospitals. Together, they have provided training to teams from the San Miguel and Santa Ana hospitals, which included site visits for the new teams at the National Maternity Hospital as well as workshops similar to those provided to other National Maternity Hospital staff. A challenge has been the procurement of the necessary supplies to begin the new programs, though the teams remain dedicated. San Miguel began to see patients in October 2011, and Santa Ana will begin to see patients in the coming months. MINSAL hopes to expand KMC programs to a fourth hospital in the future.

MINSAL is in the process of incorporating KMC into the "Guía de Seguimiento del Prematuro Menor de 2000 Gramas al Nacer," which is the official protocol for managing premature newborns.

HONDURAS

Initial engagement with MINSA and plan for the introduction of KMC

Kangaroo Mother Care (KMC) has been used in Honduras for over 20 years; PAHO sent two delegations to the Kangaroo Care Foundation in Bogotá for training in 1992 and 1993. A KMC program thrived for several years and was staffed by a pediatrician and two nurses. However, when these staff transferred to other duties, the program was eventually reduced to two small spaces at the hospital staffed by a nurse and auxiliary nurse. As a result, the program reduced its scope and suffered many problems. In March 2011, HCI approached the Chief of the Integrated Child Health Program of the Honduras Health Secretary (SESAL), Dr. Concepción Durón, to discuss implementation of a revived KMC program in Honduras.

Hospital and staff selection

SESAL and HCI visited the Neonatology Unit at the Escuela Hospital, the largest teaching hospital in Tegucigalpa, where the KMC program was implemented previously. During a meeting with the Chief of the Neonatology Service, Dr. Armando Flores, it was suggested that the existing program could be strengthened through technical support. Given the size of the project, Dr. Flores had doubts about its viability. The Chief of Pediatrics, Dr. Jorge Melendez, became involved, and it was decided that a group of providers from the hospital would attend a two week training at the Kangaroo Foundation in Bogotá. Staff who had not participated in the program previously were selected to participate, including a psychologist.

The Escuela Hospital was chosen because of its large size, central location in Tegucigalpa, availability of specialists, and the pre-existence of the KMC program at the hospital. The Neonatology and Pediatrics Chiefs from the hospital selected the staff to be trained in Colombia: Dr. Jorge Melendez, Chief of Pediatrics, was designated as the program manager; Dr. Alejandro Young, neonatologist, Yeimi Paguada, nurse, and Kenia Almendares, psychologist, also attended, along with Dr. Norma Aly of HCI Honduras.

Training in Bogotá

The two week training in Bogotá consisted of meetings at the Kangaroo Foundation and visits to Kangaroo programs at three local hospitals, where staff explained the range of services provided. Additionally, visits were made to the Neonatology Units in these hospitals to see the different types of care premature and low birth weight babies received. The Foundation provided technical support materials, such as the database they use for monitoring and evaluation. The team also received training in program management, which was attended by Dr. Aly.

Preparing a program area at the hospital

Following training in Colombia, the Escuela Hospital implementation team met to analyze the current program, its weaknesses, and follow up actions to develop an improved KMC program at the hospital with support from HCI. Since then, the team has met monthly to continue discussions around strengthening the program and to prepare the principal elements of the new program. Though there is a small existing program, the hospital plans to secure new equipment for the program, and has discussed the needed equipment with KMC programs in Nicaragua and El Salvador. The team is working with the Honduran Association of Pediatrics for additional support. There are plans to renovate a new space at the hospital to house the program; the new team will begin to see patients and implement a stronger KMC program when this space is ready in 2012.

Preparing and training hospital staff

Currently, the existing program is led by two nurses who did not participate in the training in Colombia as they are nearing retirement. Newborns with complications in the program are seen by a neonatologist. The implementation team that attended training in Colombia has oriented other pediatricians and doctors to the KMC method, and will provide more formal training for doctors and nurses in the coming months.

Monitoring and evaluating the KMC intervention

Escuela Hospital has not had an adequate information system in place, which will be necessary under the new program to ensure proper monitoring and evaluation of patients and the program. Currently, patient information is captured and recorded, including intake date, age, sex, birth weight, and observations, but external consults are not recorded. HCI is working with the Escuela Hospital staff to resolve this issue.

ECUADOR

Background

Since the mid 1980s, several KMC programs were developed in Ecuador due to its proximity with Bogotá and the Kangaroo Foundation, though none of these attempts were successful. However, the principles of Kangaroo Care are still present in many NICUs in main hospitals, though with different approaches and forms of implementation. The formal implementation of KMC in Ecuador, with technical assistance provided by HCI, will be influenced and helped by these previous experiences.

Current situation

Currently, the province of Cotopaxi is re-implementing the Kangaroo method with a new, strengthened KMC program. As there is a high prevalence of low birth weight and late neonatal mortality in Cotopaxi compared to other provinces in Ecuador, KMC is an important approach to respond to these issues. There are specific needs for better registration, parental education and training, and follow-up for newborns during their stay in the hospital and after discharge.

Many of the high-risk infants who are treated are discharged for care at home with parents who have been trained on the KMC methodology, but there is little follow-up in the ambulatory period. The outcome is unknown in most cases and some of these patients may be cases of late neonatal mortality.

Perspectives

The main purpose of the KMC effort in Cotopaxi is to develop a strengthened, organized program with protocols and systematic registration in the network of province hospitals, spreading progressively to district hospitals and then community health networks. Eventually, a stronger reference program will develop. In early 2012, three health professionals from the two main MOH and Social Security (INSS) hospitals in Cotopaxi will attend training at the Kangaroo Foundation in Bogotá in order to share the benefits of training and improve KMC delivery in the two health systems.

Even though KMC does not lend itself easily to management at the community level, access at this ambulatory stage of KMC in Cotopaxi could contribute to important results considering the interaction between local health teams and traditional birth attendants in the community known as micro-networks, which have shown positive gains by achieving great coverage of maternal and neonatal care.

OBSERVATIONS AND LESSONS LEARNED TO DATE

Motivation to develop a Kangaroo Mother Care program

The implementation of a KMC program will lead to expected reductions in hospital stay, less use of expensive resources such as incubators, formulas, and medications, and decreased mortality and morbidity among premature and low birth weight newborns. Simultaneously, KMC programs promote mother-child attachment, an emotional bond among the whole family unit, and improved breastfeeding. Parents and family gain trust in the management of at-risk newborns, and are often able to leave the hospital earlier and with greater knowledge of and confidence in care protocols for their baby.

Factors for success

- Involvement of staff and health and hospital authorities
- Assurance that the mother, father and family members are capable of appropriate management of the newborn using KMC protocols, and that they accept the baby in his or her condition
- Availability of areas for the mother to stay with the baby, and the participation of the father or another family member to support the provision of Kangaroo care
- Availability of ambulatory care and follow-up for KMC babies
- A multi-disciplinary team to support KMC, including nurses, neonatologists and pediatricians, social workers and psychologists
- Willingness of the health authorities, hospital, and staff

Areas requiring further evidence

Admission criteria: What are the admission criteria for entry to a KMC program?

1. Mother, father and/or other family members capable of managing the baby
2. Weight
3. Corrected gestational age
4. Free of illness
5. Free of pathology
6. Adequate environment

Entering KMC at a weight less than 1400 grams could put a baby at risk because of the baby's limited capacity for caloric production and limited energy reserves that make him or her more susceptible to fatigue after suction, which could cause him or her to sleep without achieving sufficient feeding. This can lead to a negative energy balance and limited weight gain. Can a hospital KMC program support newborns weighing less than 1400 grams? For these cases, should there be complementary or total feeding with nasogastric tubes?

Babies less than 35 weeks of corrected gestational age (34 weeks and 6 days) have not yet fully developed a sucking reflex; clinical management of these babies may require a feeding tube. Gestational age as the main admission criteria has gained momentum. Can the admission criteria by gestational age be independent of weight criteria? Or is weight of even greater importance?

Oxygen needs and the presence or absence of infection, thermoregulation, hypotension, or hypoglycemia are among the most important admission criteria for a KMC program. These pathologies require specialized care. Is it necessary to establish specific management criteria for babies with higher-risk pathologies, and can they participate in KMC?

How are mothers, fathers, and family members trained and evaluated on the delivery of KMC?

Activities of the hospital staff: Is there time dedicated to training mothers, fathers, and family members in the KMC technique and methodology? How is their understanding verified? Are psychology, nursing, medical, and social work staff involved? Are sufficient resources available, such as blankets and lycra belts? Is informed consent obtained from families prior to program admission?

Physical area

The physical area must be suitable for the risks and stress that develop in the hospital and during ambulatory care. It is important that the KMC program area is temperature controlled, has available resources for mothers and families, such as food and appropriate furniture, with monitoring and access to specialized care for babies. What should the minimum conditions and inputs be for a KMC program space?

Discharge criteria for KMC

What program criteria are recommended for discharge? Although internationally accepted standards have not been established, it is universally important to determine whether the newborn has passed his or her period of greatest risk, and consideration must also be given to weight and gestational age.

The minimum discharge weight for KMC programs in many countries is 2000 grams, though some recommend that an ideal discharge weight is 2500 grams. Often, babies in Kangaroo Care that weigh more than 2000 grams experience discomfort due to the heat and limitation of their movements. Is the criteria of the newborn's discomfort in the Kangaroo position sufficient for discharge from a KMC program? Is 2000 grams a reliable minimum threshold for the baby's energy independence?

40 weeks corrected gestational age is the upper limit on the KMC recommendation for participation in the method, which is often met before the weight criteria. Should this discharge criteria be emphasized?

Care in the ambulatory phase:

The baby can be discharged from the hospital to continue KMC in the home when he or she meets the following requirements:

- Weight: Does the baby weigh at least the recommended standard of 1800 to 2.000 grams? Is there consensus about the weight at which the baby is risk-free – 1600 grams?
- Daily weight gain: The baby must attain sufficient weight gain prior to discharge. Has the baby gained at least 15 g/day for at least three days? Has the baby gained 20 to 30 g/day for at least three days?
- Feeding: Is the baby sucking efficiently?
- Support for mothers, fathers and family members: The family should be seen by a psychologist, nursing, medical, and social work staff during evaluation for discharge. Are the parents and family able to give proper care to the baby according to KMC guidelines? Is there adequate attachment between mother and baby?
- The home environment: Is there an adequate physical area in the home? Is there sufficient emotional and psychosocial support?

Indicators for intra-hospital monitoring

Intra-hospital monitoring criteria:

- Daily weight gain: Is there daily monitoring of weight gain?
- Feeding: Has the family received breastfeeding counseling? Does the baby receive alternative feeding? Were fortifiers or nutritional supplements offered as an alternative to breastfeeding?

- Care provided by the mother, father and other family members: Is there monitoring of the care provided by the parents or family?

Results of KMC implementation:

- Hospital stay: KMC decreases risks for preterm and low birth weight babies as compared to conventional care method and lowers occupancy in nursery beds, allowing for greater availability of intensive care for higher-risk infants requiring specialized care.
- Days of hospital stay: What is the average length of stay for intra-hospital KMC? What is the average length of stay for newborns not participating in KMC?
- Reduced mortality and morbidity: A positive effect of a KMC program is that it allows for skilled medical staff to spend more time providing care for critical care cases. What are mortality and morbidity rates with KMC? What were mortality and morbidity rates before a KMC program?
- Improved mother-child attachment: There are many psycho-social benefits of KMC as compared to conventional care for premature and low-birth weight babies. Are there signs of increased interest in health and a higher quality of life for infants and families that have participated in KMC? How do participants compare to non-participants?
- Economic benefits: How have the costs and expenses varied with and without KMC?

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