Helping babies breathe in Sudan

A hospital-to-hospital partnership between Cork and Sudan aims to reduce neonatal deaths in Sudan by focusing on training village midwives in neonatal resuscitation techniques

AS THE deadline for the United Nations Millennium Development Goals passed in 2015, sub-Saharan Africa continues to have the highest rate of child mortality and did not reach its predefined targets by 2015.[1] In addition, this region has the highest rate of neonatal death and shows some of the least progress in this area. An increasing proportion of child deaths occur in the neonatal period, which is becoming a significant global health problem.

While the neonatal mortality rate in Sudan has declined from 38 per 1,000 live births in 1990 to 31 per 1,000 live births in 2011, the absolute number of neonatal deaths has actually risen from 32,000 to 35,000 in the same period, according to a UN report.[3] Almost one in four of these (23%) can be attributed to complications arising from birth asphyxia, where the newborn infant fails to initiate or maintain regular breathing at birth. Interventions to address this could help reduce the significant loss of life at this early age.

A systematic review indicates that few babies need advanced resuscitation and simple low-cost interventions, such as training healthcare workers in neonatal resuscitation techniques, could reduce the neonatal mortality rate by up to 43%.[4]

There are almost 16,000 village midwives in rural Sudan serving a population of over 35 million people. Many of the midwives are lone practitioners in villages with limited community resources for home delivery. Education of midwives in Sudan can be challenging due to variations in training at the district midwifery schools, diploma schools and university nurse midwifery programmes. As almost 80% of births in Sudan occur outside medical facilities, usually in the home in isolated rural villages, a well-trained village midwife who attends most deliveries is key to reducing neonatal death. While they have strong maternity skills, village midwives are not routinely trained in resuscitation and yet about 10% of babies require some resuscitation at birth. To address this, a unique hospital-to-hospital partnership has successfully changed its focus from the hospital to the community by implementing a sustainable national newborn resuscitation training programme called Helping Babies Breathe (HBB), directed specifically at village midwives in Sudan.

In 2002 an international partnership was established between Cork University Maternity Hospital and Omdurman Maternity Hospital in Sudan. Its primary objective was to develop educational and research programmes to improve mother and child care, and create a robust bilateral international healthcare partnership model.[5] Implementation of the HBB programme was a recent initiative by this partnership to address neonatal mortality in Sudan.

Helping babies breathe programme

HBB is an evidence-based educational programme developed by the American Academy of Pediatrics (AAP). It is designed specifically to train village midwives and other healthcare workers who lack neonatal resuscitation skills, as the majority of babies in low resource settings are born in the community. It is a 'train the trainer' programme that incorporates a number of key life-saving skills, such as rapid assessment at birth, stimulation to breathe and assisted ventilation with a bag and mask, which are delivered within the first 'golden minute' after birth. Use of simple measures such as drying the baby, keeping them warm, clearing the airway and providing stimulation to breathe is effective in resuscitating the majority of newborns. Therefore, HBB focuses on simple, low-cost

interventions that village midwives can easily learn and put into practice to reduce neonatal mortality.

This HBB project was supported by grants from Irish Aid and the Irish Government's Programme for Overseas Development as well as from the Ministries of Health in Sudan. It received the approval of all relevant national governmental and professional bodies before being rolled out. It was undertaken in partnership with the Sudanese State and Federal Ministries of Health, the National Training Authority, the Continuous Professional Development Directorate and the Sudanese Paediatric and Neonatal Associations. This helped ensure HBB was aligned with strategic national goals for maternal/newborn services and through local ownership the programme could be tailored to the Sudanese context.[6]

An initial HBB 'train the trainer' course was run in both English and Arabic in Khartoum in January 2013. Sudan was the first country to have the HBB programme rolled out in Arabic. All HBB materials were translated into Arabic by the Sudanese partners, with permission from the AAP and funded through Irish Aid. A sample of 30 paediatricians, 12 senior midwives and 42 health visitors were recruited from the major maternity hospitals in Khartoum and each of the regional health centres across the 17 states in Sudan. These individuals were selected due to their extensive experience in labour and delivery, fluent English and Arabic, and senior roles within their respective communities of practice.

The HBB master and facilitator trainer courses were held over four days and delivered to 42 senior paediatricians and midwives, and 42 health visitors respectively. They were run by an international HBB team from Ireland, the US and Sudan with the aim of training enough regional trainers, who in turn could train others within their healthcare facility or local community.

HBB self-evaluation and assessment was administered after the training course. An MCQ with an 80% pass mark and post-training assessment of bag and mask skills, as well as two objective structured clinical examinations, were given. A training evaluation questionnaire was also distributed to all participants.

Results

The results of the English-based MCQ assessment showed an overall mean score of 98%; ranging from 71-100%, with two scores below 80%. Results of the Arabic MCQ showed an overall average of 89%; ranging from 71-100%, with eight scores below 80%. This demonstrates participants gained key knowledge in relation to neonatal care and evidenced-based resuscitation practices. All candidates successfully passed the OSCE of bag-mask ventilation skills. Participant observation showed mastery of ventilation skills and the integration of these skills into case management scenarios in a simulated classroom setting. Participants reported a high satisfaction with the HBB programme, including the attainment of key neonatal resuscitation skills.

Extension of the HBB programme

On successful completion of the course, each participant was given a HBB training kit comprising a pictorial resuscitation algorithm chart, a learner workbook with guidelines on neonatal resuscitation, a bidirectional flipchart with training instructions, a neonatal simulation mannequin and equipment, including a reusable bag-mask ventilator, and a bulb suctioning device. This will enable the HBB 'train the trainer' programme to be implemented across rural Sudan. Since January 2013, we have provided over 1,000 bag and masks and 100 sets of training equipment to CPD centres for distribution. This has resulted in more than 1,200 village midwives being trained via the HBB registered provider course.

National implementation is being driven by local healthcare workers, regional HBB facilitators, national HBB master trainers and regional Ministry of Health staff. Several train-the-trainer courses have now taken place ensuring HBB facilitators have been trained across the 17 states. Trainers are now responsible for delivering the standardised educational programme in their localities with support from the master trainers and the central State Ministry of Health. This approach will continue until the target figure of 16,000 trained village midwives is reached. The rate limiting step is the cost of the equipment (bulb suction and bag-mask device) given to each midwife, which currently costs around €25 per set.

The HBB programme has also been incorporated into the midwifery training schools curriculum by the National Academy of Health Sciences. This will ensure the sustainability of neonatal resuscitation techniques in midwifery education so that every graduating village and hospital midwife in Sudan will have the key life-saving skills necessary to support newborns.

The HBB initiative has shown how a collaborative partnership based on collective action and local ownership can bring real improvements in health services delivery for newborn care. Important lessons have also been learned that are guiding the future direction of the partnership. There are a number of limiting factors that could prevent the HBB programme and neonatal resuscitation from becoming embedded in routine clinical practice in Sudan:

- Sudan's large land mass and often inhospitable terrain make the accessibility of any national training challenging
- The financial cost of purchasing additional essential training equipment, eg. neonatal mannequins, bulb suction and bag
- The sustainability of the programme will require regular upskilling of village midwives at provincial community centres
- A recent systematic review concluded that training in basic newborn care in the immediate neonatal period is a necessary adjunct to structured newborn resuscitation training courses to reduce early neonatal mortality in developing countries.[7] Therefore, village midwives also need to be trained in new programmes such as the AAP's Essential Care for Every Baby, in addition to HBB, if significant improvements in neonatal mortality are to be achieved.

The priority in the medium term will be to provide resuscitation equipment for the remaining village midwives. A long-term exit strategy needs to include a means of either local production or more competitive pricing on the resuscitation equipment.

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