

Improving the survival, growth and development of low birth weight newborns through better nutrition: the Neonatal Nutrition Network project

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Background

Most neonatal deaths occur in sub-Saharan Africa and South Asia, particularly in low birth weight (LBW) infants (<2500g) Immature gut structure and function in preterm infants compromises nutrition, facilitates sepsis through bacterial translocation and risks necrotizing enterocolitis (NEC). Abnormal microbial colonization of the gut occurs during prolonged neonatal unit admission including with anti-microbial resistant bacteria.

Improved gut health and early nutrition would likely prevent sepsis and improve brain and other organ development. Novel nutritional interventions such as pre/probiotics, buccal colostrum and lactoferrin may improve gut function thereby improving nutrition and longer-term outcomes.

Neonatal Nutrition Network members



Ibadan workshop participants Photo: A Akindolire

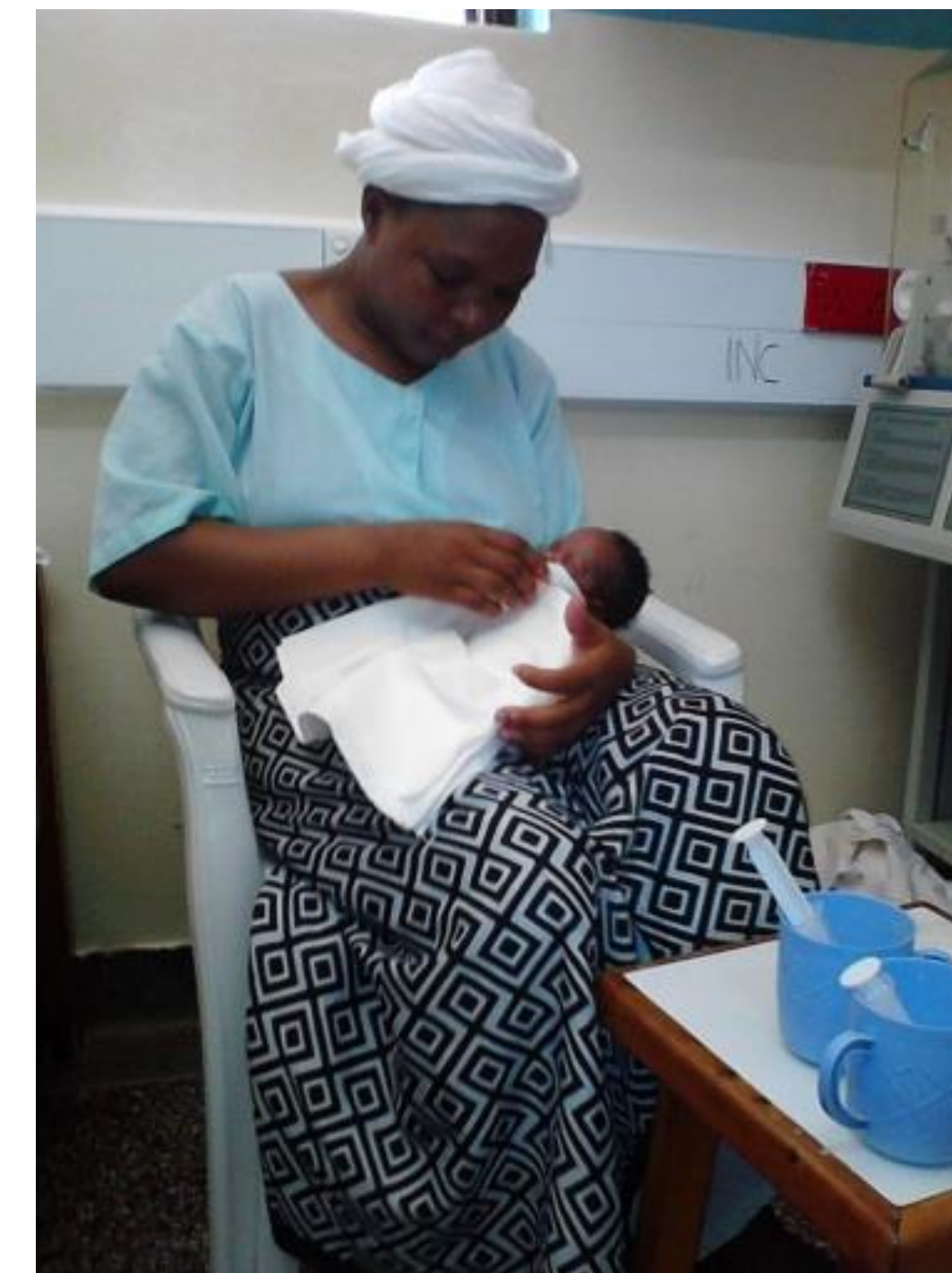
The project started in March 2018 with Medical Research Council (UK) funding for 12 months. The network currently consists of the neonatal units of 2 hospitals in Kenya: Kilifi County Hospital and Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu; and 5 in Nigeria: Lagos University teaching Hospital; Massey St. Children's Hospital, Lagos; Maitama District Hospital, Abuja; Ahmadu Bello University Hospital, Zaria; University College Hospital, Ibadan, with coordination from researchers at Liverpool School of Tropical Medicine (LSTM). A joint meeting of network members with the Nigerian Society of Neonatal Medicine was held in Ibadan in March 2018 with visiting researchers from LSTM. Another network workshop is planned for June 2018 at Kisumu.

Activities

- Neonatal unit feeding survey** We will document current feeding practices in neonatal units throughout Kenya and Nigeria through dissemination of a survey to paediatricians through their respective professional associations.
- Development of clinical case definitions and a shared database.** The network members will develop standard case definitions for common neonatal morbidities, including neonatal sepsis, respiratory distress, asphyxia and abdominal problems such as necrotizing enterocolitis. We will develop a common database to be tested across the neonatal network units, share anonymized clinical data and identify priorities for research. The dataset will collect information about maternal and early life variables as a basis for the assessment of long-term growth, respiratory and neurodevelopmental outcomes.
- Identification of core outcome sets for research.** These will be chosen via discussions with health staff and families.
- Pilot new sample collection techniques.** We will pilot test volumetric absorptive microsampling technology combined with QPlex Array for measuring inflammatory markers and micronutrients in small blood samples.
- Comparison of maternal microbiome (from HVS) and neonatal faecal microbiome** using high resolution melt based qPCR to describe acquisition of anti-microbial resistance genes in faecal flora.



Preterm baby at Kilifi County Hospital Photo: M. Boga



Mother feeding one of triplets Photo: M. Boga

Outcomes

Platform for follow up of long term effects of early nutrition of low birth weight babies

There are few good studies which demonstrate the effect of early feeding practices in low birth weight newborns on longer-term outcomes in LMIC settings particularly in relation to developmental outcomes. The network will form a basis for the follow-up of low birthweight infant cohorts to evaluate long-term effects of early nutrition and modulation of the developing gut microbiome.



Triples at 8 months Photo: M Boga

Capacity building for neonatal research.

We will engage other neonatal units in Kenya and Nigeria and develop processes that can be rolled-out to expand the network as a resource for multicentre clinical trials.

Systematic Review on feeding practices for low birth weight infants in low and middle income countries to inform future research

Evidence for feeding regimens that most effectively establish oral feeds has come from research mostly conducted in high income countries. Dr. Abimbola Akindolire, Ibadan, Nigeria, will lead a systematic review with support from the co-investigators to evaluate the strength of current evidence and identify evidence gaps that could be addressed through future research by the network.

