The Challenge of Improving Neonatal Mortality in India: Key to Global Achievement of MDG 4

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In Millennium Development Goal four (MDG4), national leaders committed to reduce 1990 levels of child mortality in their countries by two-thirds by 2015. Between 1990 and 2009, child mortality has reduced globally from 89 to 60 per 1000 live births [1]; however, this trajectory is not sufficient to achieve MDG4. India has the highest number of births in the world and also accounts for over 20% of all child deaths. Achieving MDG4 globally depends on the progress and success in India, more than in any other single nation [2].

Much progress has been achieved in India, with child mortality having reduced by more than one third since 1990, to 66 deaths per 1000 live births in 2009 [1]. However, despite this impressive improvement, India is unlikely to achieve MDG4 due to persisting high rates of neonatal mortality. Two-thirds of infant deaths occur in the neonatal period, and more than one-third of these in the first seven days of life. Of all babies born annually with low birth weight, 42% (8.3 million) are born in India; increased vulnerability to sepsis and poor infant feeding practises, mean these newborns are about 20 times more likely to die in infancy [2]. Furthermore, most babies are born outside of a health facility, with only 53% having a skilled attendant present at delivery, so in many cases these babies first contact with health facilities is when they are sick [1]. Tackling this disproportionate rate of neonatal mortality is essential for India to achieve MDG4.

Integrated Management of Childhood Illness (IMCI) was developed by WHO/UNICEF in the mid-1990s, as an integrated approach to increasing coverage of evidence-based interventions in children aged < 5 years, and is widely implemented in over 100 countries globally. However, generic IMCI guidelines initially excluded interventions for neonates in the first seven days of life because there was insufficient evidence available about clinical predictors of severe illness in this age group [3].

The Integrated Management of Neonatal and Childhood Illness (IMNCI) is an important innovation in India. This evidence-based adaptation of IMCI responds to the particular challenges in India, and, in particular, aims to reduce neonatal mortality. The IMNCI guidelines in India include the first seven days of life with the aim of bringing essential newborn care to the doorstep of households. Frontline health workers are trained to routinely visit new mothers at home, assist with breastfeeding and recognise signs of severe illness in newborns. IMNCI also increases the emphasis on the neonatal period during training [4], and is now being implemented in almost 300 districts in India [5].

In this edition of Indian Pediatrics, Kaur *et al*. [6] present an evaluation of the signs used in the IMNCI algorithm to identify severe illness in young infants, especially in infants aged 0-7 days. The algorithm primarily aims to correctly identify young infants requiring referral to a higher level of care. If the algorithm is not sufficiently sensitive, infants may die at home, having been sent away from the health facility. However, if the algorithm is not specific, there will be too many referrals, placing a heavy burden on families and the health system, and

exposing infants to iatrogenic illness. The investigators showed that, although infants aged 0-7 days presented with conditions such as birth asphyxia and meconium aspiration, which are different from those found in older infants, the such infants were classified them as having possible serious bacterial , and the algorithm correctly identified them as requiring urgent referral. Although this is reported as a diagnostic mismatch, appropriate referral rather than diagnostic accuracy is the aim of the algorithm. Few infants in this age group were referred unnecessarily, and when this did occur, it was mainly due to procedural differences between the referral hospital and IMNCI guidelines in applying the weight cut off for admission.

As much as these results are very encouraging, more work is needed. The study was conducted at a paediatric referral centre, so that enrolled infants had already been identified as sick and in need of care by the parents. The prevalence of severe illness is likely to be high in this setting, and IMNCI assessments were undertaken by paediatric staff. More research is required to validate the effectiveness of the algorithm in the community and primary care setting, where it is intended to be used, and in particular to evaluate its performance as a screening tool to identify sick young infants during the routine newborn visits recommended by IMNCI. Further research is also required to determine the impact of IMNCI implementation on neonatal mortality.

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