improvement in performance as a result of the subjects' knowledge of being observed. The significance of this effect is that the improvement due to this factor may not be sustained. Moreover, training the surgical team to rigorously incorporate checklists should be an ongoing venture, especially at training centres where new members are added periodically to the team.

On the basis of these results, the National Patient Safety Agency in the UK has issued a safety alert that requires all trusts in England and Wales to complete the WHO checklist for every surgical procedure and this is to be fully implemented by February 2010.[9] Incorporating a simple surgical checklist like the one introduced by the WHO[10] in operating rooms in India will certainly minimize preventable surgery-related complications and death.

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An integrated nutrition and health programme: The impact on neonatal mortality in rural northern India

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SUMMARY

The objective of this study was to assess the impact of the maternal and newborn health component of a community-based 'Integrated Nutrition and Health Programme' (INHP). This large, community-based programme was implemented by the Government of India with the help of an international non-governmental organization (NGO) and local NGOs in 8 states of India utilizing the existing infrastructure. In the programme, the services and health education were provided, after 6 days of training, by auxillary nurse midwives (ANMs), *anganwadi* workers and change agents (community volunteers to enhance the reach of the programme).

Although the programme was implemented in 8 states, the evaluation was done in 2 rural districts of Uttar Pradesh in this quasi-experimental study. Barabanki was selected as the intervention district and Unnao the comparison district. In both districts, the blocks were selected randomly and one sector, which had a population of 20 000–25 000, was selected from each block. In both districts, a baseline survey was done in 2003 and at the end of the project there was an end-line survey in 2006 regarding the mothers' knowledge, practices and neonatal mortality. Nearly 15 000 mothers who had given birth in the preceding 2 years were interviewed in both the baseline and end-line surveys. Data collection was done by trained personnel through an independent survey research agency which was supported by an independent quality assurance system. Population-level data of this health programme regarding various parameters such as the rate of actual exposure to the programme, rate of behavioural change in the mothers in the fields of antenatal, perinatal and neonatal care practices was collected, and their impact on neonatal mortality analysed.

In the intervention district, the frequency of home visits by community-based workers increased during both antenatal (from 16% to 56%) and postnatal (from 3% to 39%) periods. At the end-line survey, home visits were significantly higher in the intervention district as compared with the control district. The frequency of mothers getting any antenatal check-up, proportion of those receiving $\geq$2 tetanus immunizations, number of deliveries attended by skilled birth attendants, clean cord care, and newborn check-up improved significantly in the intervention district at the end-line survey compared with the baseline. Neonatal mortality rate, which was the primary outcome, did not change in either of the districts when only an antenatal visit was received. However, in neonates who received a postnatal home visit within 28 days of birth, there was a significant relative reduction of 34% in neonatal mortality compared with those who did not receive a postnatal home visit (35.7 *v*. 53.8 deaths per 1000 live births), after adjusting for sociodemographic variables. The largest reduction in neonatal mortality occurred in those who received the postnatal visit within the first 3 days after birth.

The authors concluded that because of limited programme coverage, an impact on neonatal mortality could not be demonstrated

at the population level. However, the impressive reduction in neonatal mortality in those who received postnatal visits shows a promising potential for the programme if coverage can be improved.

COMMENT

India contributes to 25% of the global neonatal deaths[1] and, for a developing country like ours, community and family-level interventions are crucial to reduce the burden of neonatal mortality. In settings where health systems are weak, early success in averting neonatal deaths is possible only through outreach, family–community care including health education to improve home-care practices and healthcare seeking, as was emphasized in the *Lancet* neonatal survival series.[2] This programme, which is a partnership between an international NGO and the Government of India, is a step towards strengthening the family–community level of care.

This study with a robust design and statistical methods tries to fill a gap in population-level data regarding the actual exposure of the families to large, community-based programmes and the behavioural change resulting from them. The uniqueness of this programme lies in the fact that it used the existing government infrastructure and personnel to deliver antenatal and postnatal services and change health-seeking behaviour. The programme used interventions already proven to reduce neonatal mortality in community-based efficacy trials. These trials were conducted in highly controlled programme areas and used specially designated personnel to deliver the services unlike the current programme which was set up in a 'real-life situation'.

Though some of the maternal behaviours improved in the intervention district, this did not translate into better neonatal survival. This was predominantly due to inadequate coverage by community-level workers. Only one-third of all mothers had at least 1 antenatal and postnatal visit at the end-line survey even in the intervention district and <25% of neonates received a home visit in the crucial initial 3 days after birth. Other trials such as the Gadchiroli field trial, which was conducted in a controlled environment with high coverage, could demonstrate a significant decrease in neonatal mortality even with home-based care.[3] Large scale programmes such as the Integrated Management of Childhood Illness (IMCI) have also shown varied effectiveness in different countries largely due to variations in implementation.[4] Another possible reason for the lack of reduction in neonatal mortality could be that postnatal interventions in this programme did not contain some of the cost-effective interventions of proven efficacy such as pneumonia case management. According to the *Lancet* neonatal survival series, the predicted reduction in neonatal mortality with this intervention is 27%.[2]

Some of the results of the study should be interpreted cautiously. A post hoc analysis of the pooled data of both intervention and comparison districts revealed that postnatal visit alone reduced the neonatal mortality with or without an antenatal visit and this benefit persisted after excluding deaths that occurred on the day of birth. As the comparison district was out of the INHP, the content of antenatal counselling and type of antenatal care might have been significantly inferior in this area and could have adversely affected the importance of the antenatal visits in the pooled data. As rural mothers who had given birth in the preceding 2 years were interviewed, the reliability of some items such as breastfeeding in the first hour, thermal care for first 6 hours and postnatal visit on the day of birth remains questionable due to recall bias, and pooling the data may increase this bias.

In conclusion, though community-based, cost-effective interventions to reduce neonatal mortality are known, this study highlights that implementation of such interventions on a large scale within the existing health systems is not easy. There is a need to conduct operational research on strategies for better coverage and implementation such as simple tools for administration, focused content, better supervision and training for field assessment skills.[5]

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Further progress in the treatment of multiple myeloma?

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