50 Years of Neonatology in India: Progress and Future

SIDDARTH RAMJI, MANOJ MODI AND NEERAJ GUPTA

From Department of Neonatology, Maulana Azad Medical College, New Delhi 110 002, India.

Correspondence to: Dr Siddarth Ramji, Professor and Head, Division of Neonatology, Department of Pediatrics, Maulana Azad Medical College, New Delhi 110 002, India. siddarthramji@gmail.com

India has made impressive gains in its child survival indices during the past half a century with infant mortality rates declining from 159.3 in 1960 to 44 in 2011 and neonatal mortality rate declining from 47 (1990) to 32 (2010). Neonatal health is now an integral part of the country's flagship program – National Rural Health Mission. Facility based newborn care is not only available in large public and private sectors hospitals, but also in about 300 of India's district hospitals. Complementing these efforts is home based newborn care being delivered by community health volunteers. The last two decades has also witnessed an increase in newborn research and its incorporation into medical and paramedical education as a major course component. Neonatology now is an independent super-specialty in India. The National Neonatology Forum has had a major role in spearheading reforms in neonatal care in India.

Key words: *Community newborn care, Neonatal health, Neonatal mortality.*

India has made impressive gains in its child survival indices during the past half a century. Infant mortality rate has declined from 159.3 in 1960 to 44 in 2011 (average annualized decline of 2.2 points). Neonatal mortality rate in the last 20 years has declined from 47 (1990) to 32 (2010) (average annualized reduction of 0.8 points) contributing to almost half the rate of the reduction in infant mortality [1]. However, despite these reductions, there are large variations in neonatal survival between rural and urban India, across health facilities and across states in the country.

NATIONAL HEALTH POLICY AND NEONATAL HEALTH

Focus on child health prior to the eighties was mainly on infectious diseases, particularly the vaccine preventable diseases, diarrhea and malnutrition. It was the publication of the Report of the Task Force on Minimum Perinatal Care in 1982 by the Ministry of Health and Family Welfare [2] that catalyzed neonatal health onto the national agenda. A major concurrent milestone was the birth of the National Neonatology Forum (an academic body of health care providers committed to advancing neonatal health in the country) in 1980. The NNF has since then played a pivotal role in all major neonatal health care milestones in the country. It took a decade before the recommendations of the Task Force on Minimum Perinatal Care were translated into program mode with introduction of "Essential Newborn Care" under the Child Survival and Safe motherhood program (CSSM) in 1992. In 1997-98 CSSM got integrated into the country's Reproductive and Child health program. Since 2005 neonatal health at both community and institutional level, has become an integral part of India's National Rural Health Mission (NRHM).

FACILITY BASED CARE

Identified neonatal care facilities providing essentially primary and some secondary care began to dot the Indian skyline during the sixties. However neonatal intensive care in India began to make its appearance only in the eighties in a few select teaching institutions across the country when a select group of neonatologists decided to walk the "untrodden" path and import into the country the western mores of neonatal intensive care facilities. Even in the early nineties there was woefully small number of intensive care facilities [3]. However, during the last decade there has been a phenomenal growth of neonatal intensive care units in the country, especially in the corporatized health care sector and to a lesser extent in public sector health care facilities. Principal catalysts that have contributed to this growth have been availability of trained neonatologists (trained in India under its DM (Neonatology) doctoral program, and fellowship programs in India and abroad) and equipment for newborn care. The latter in particular was triggered by the publication on biomedical equipment (1991) and operationalization of facility based district newborn care under the CSSM program [4]. Accreditation norms initiated in 1991 set the tone for quality institutional care in India.

However, the transformation of the district newborn experiment in 30 districts under the CSSM program into district level special newborn care units took another decade. The feasibility of establishing and operating a special neonatal care unit at the district level was first demonstrated in the Purulia district of West Bengal in early part of this century [5]. This model was then adapted for scale up by the Ministry of Health, Government of India under the NRHM. The State Governments were assisted in the scale-up jointly by the NNF, UNICEF and in some states by the Norway India Partnership Initiative (NIPI). The operational guidelines provide details of designing the special care newborn units (SCNU) at district level, newborn stabilization units (NBSU) at first referral units and newborn care corners (NCC) at all active delivery points in a district. It also provides details of equipment and their procurement, manpower details, data collection and newborn care protocols [6,7]. Currently about 300 SCNUs are reported to be operational in the country [8]. The progress in making specialized newborn care units more accessible and affordable to the community at large has not been without its problems. The greatest challenges have been in recruiting and retaining trained medical and nursing manpower, equipment maintenance and mentoring these units.

The need for facility based newborn care has also increased since the introduction of "*Janani Suraksha Yojna*" (JSY), a cash transfer incentive scheme for promoting institutional deliveries in 2005 and the " *Janani Shishu Suraksha Karyakram*" (JSSK), a free and cashless maternity and newborn services in all government health care institutions in the country in 2011 under NRHM. The JSSK was approved with an outlay of Rs.1437 crores for 2011-12 and Rs.2103 crores during 2012-13 [9]. Transport and access to health facilities has been a major hurdle in newborn survival. The JSSK has attempted to plug this void by assuring free transport for sick newborns from home to health facility and back. Up to the first quarter of 2012, 10-30% of the target population has been able to avail of this benefit [9]. But these are early days of the program and it holds promise to improve access for mothers and newborns to health care facilities and also decrease out of pocket expenses for health care amongst the poorer sections of our community

COMMUNITY NEWBORN CARE

Despite the schemes outlined above, home deliveries still constitute 30-40% of all deliveries in the country. Even after institutional deliveries the mother-newborn diad is back home by 48 hrs and there is little follow-up thereafter. Thus, a large proportion of newborns in the country continue to be at risk of developing problems that may not be recognized or receiving appropriate treatment in time. There is thus a need for community based newborn care to complement efforts in developing newborn care facilities at institutions. It was the work in Gadhchiroli (in rural Maharashtra) in the nineties that paved the way for community newborn care by trained community health workers in the country [10]. This field experiment demonstrated that basic health workers could be trained in providing essential newborn care through regular home visits and that they also could be trained to treat neonatal infection with drugs, under supervision. The Indian Council of Medical Research initiated a large cluster randomized trial in 2005 to assess the feasibility of scaling up the Gadchiroli experiment [11]. A recent systematic review has supported the role of community health workers in reducing neonatal mortality in regions with high NMR [12]. At present delivery of Home Based Newborn Care (HBNC) by Accredited Social Health Activist (ASHA) has become an integral part of NRHM [13]. The SCNU and NBSU are being integrated to support HBNC. The linkages between the two have initiated the process of tracking newborns and their mothers during the first 4 weeks of life for survival.

NEONATAL RESEARCH

Status of research in neonatology has paralleled the evolution of neonatal care in the country. It has evolved from descriptive studies and retrospective analysis of past experience to epidemiological and experimental studies. In an evaluation by Narang, *et al*. [14] of four major indexed Indian journals from 1996-2001, it was observed that only 11.8% studies pertained to neonates, out of which a third were analytical studies and about 9% were experimental. The major areas of research still reflect the burden of neonatal disorders that are documented in the country – birth asphyxia, low birth weight, infections, jaundice, neonatal nutrition and long term outcomes. Most studies have been unicentric and small to medium in scale with little possibility of impacting policy or practice change. However, there have also been high quality researches that have had not only national, but global impact. One of the earliest publications that provided a reference for intrauterine growth and recognition of fetal growth retardation was by Ghosh, *et al*. in 1971 [15]. Since this seminal publication there have been a large collection of works on low birth weight and its many associations and outcomes. However, two outstanding cohort studies, one from Delhi [16] and the other from Pune [17] have provided valuable information on outcome of low birth weights not only into childhood but also adulthood. Another multicentric clinical trial that influenced global neonatal resuscitation guidelines on use of room air was published in 2003 [18]. However, in the past five years one has witnessed a

changing scenario with several high impact clinical trials having been published from the country [19-23]. Clearly neonatal research is coming of age in India.

EDUCATION AND TRAINING

NNF in 1981 published its recommendations on Education and Training in Neonatology. It laid standards for neonatal teaching and training for medical graduate and postgraduate students as also for nurses. The current curricula in neonatology have much to owe to this document. Neonatology today comprises a quarter of graduate medical training in pediatrics. Neonatal components of postgraduate program in pediatrics are well structured. From humble beginnings, the country now has at least 9 institutions that provide training in DM (Neonatology) and a similar number offer neonatal training under the aegis of the National Board of Examinations. Nursing curricula too have been duly modified to incorporate neonatal training in their courses.

Neonatal health in India is making rapid strides. However, the challenge of meeting the goals of MDG15 are still immense. If newborn health has to become universal and meaningful in India, it has to bring together not only clinicians and nurses, but social scientists, public health experts, economists, biomedical engineers, pharmaceutical industry and research scientists. The next 50 years has to be one of collaboration.

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