

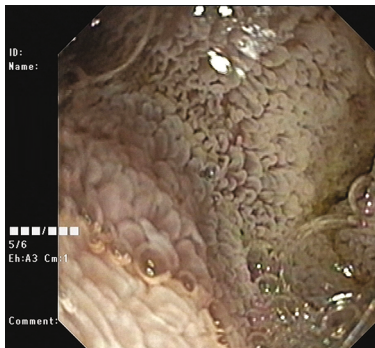
Indian Pediatrics Case Reports

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Academics



Social Pediatrics



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A Low BirthWeight Baby with Sepsis: The Role of Primary Health Centers (PHCs) in Managing Sick Newborns

India has a neonatal mortality rate (NNMR) of 20.3/1000 live births, contributing to over one-fifth of all neonatal deaths in the world.^[1] The three major causes of death are due to intrapartum-related events, preterm birth complications, and sepsis. Most intrapartum-related deaths occur during the 1st week, while those due to preterm birth complications and sepsis can occur anytime during the neonatal period. Moreover, over three-fourths of all the deaths occur during the 1st week, while the remaining are observed between the 2nd and 4th weeks.^[2]

For large parts of rural India, the primary health centers (PHCs) are the most accessible health facilities for the community, in comparison to the more distantly located sub-district and district hospitals (DHs). There is a network of over 30,000 PHCs spread across the country, yet they play a very minor role in newborn care and reducing neonatal mortality: less than 20% of deliveries take place at PHCs;^[3] one-third of the PHCs do not conduct deliveries at all; and those that do, face challenges related to the availability of trained doctors and nurses, and lack of requisite equipment and supplies.^[4]

PHC Nithauwa is a remote PHC that Basic Health Care services have been running for the last 7 years, in partnership with the state government of Rajasthan. It is located in Dungarpur, one of the poorest performing districts in terms of indices related to health and nutrition. Over 85% of the population, the PHC serves are tribal, who have a high burden of malnutrition and illnesses, irrespective of age or gender. The PHC is located 45 km from the nearest sub-DH that has a functional Sick Newborn Care Unit (SNCU) manned by a pair of pediatricians. The nearest Level-3 newborn care unit or neonatal intensive care unit (NICU) is in the city of Udaipur, about 120 km away.

In this article, we share the case study of a small (low birth weight) sick newborn who was delivered at the sub-DH and managed at the PHC. The readers, most of whom are practitioners or residents working in urban areas with easy access to basic services and health facilities, may wonder why we are reporting such an ordinary clinical case. The purpose of this report is to highlight the inequity in the availability of newborn care in remote and rural areas and to discuss the challenges of managing small sick newborns in such settings. We also wish to bring urgent attention to strengthen PHCs in the provision of newborn care. The attention, thus far, has been on setting up and managing SNCUs at DHs.

CASE STUDY

Baby of Deepa (name changed), a 29-day-old girl was brought to the PHC in April this year, with a history of fever for 10 days, followed by decreased feeding and lethargy for

3 days. There was no history of fever, loose stools, vomiting, respiratory distress, decreased urine frequency, inconsolable cry, or seizures. She was born to a primipara mother by a full-term vaginal delivery at the sub-DH. Being low in birth weight (2000 g), she was admitted to the SNCU for a week and discharged on the 8th day of life-on exclusive breastfeeding, and with a good cry and active movements. As per the local custom, the mother–baby dyad came to her parent’s home, about 8 km from the PHC (during pregnancy, the mother had lived with her in-laws, her husband being away in Kuwait where he worked as a manual laborer). Thus, information regarding the pair was not available to the concerned accredited social health activist (ASHA), auxiliary nurse midwife (ANM), or PHC team. The mother and baby, therefore, did not receive the benefits of the usual home visits made by the health team. Over the next few days, the mother (and other family members) felt that there was inadequate breast milk production, and hence the baby started being fed undiluted cow’s milk by “*katori and spoon*.” When the baby fell sick, she was taken to an unregistered local practitioner for treatment. Since the father was away, and there were no other available male members, the women folk found it difficult to bring the baby to the PHC. During this period, she received traditional medicines and syrups, of which no records were available. It was only after a week, when the baby did not show any improvement, that they decided to bring her to us. There was no history suggestive of COVID in any family member, though none of them were vaccinated.

At presentation, she appeared lethargic with a feeble cry and poor activity. The temperature was 99°F, pulse rate – 124/min, respiratory rate – 56/min (without retractions), and oxygen saturation of 97% on room air. Her weight was 1.8 kg (small for gestation age; <-3 Z-score). Since she appeared sick, we did not record her length and head circumference. She looked pale. Salient systemic findings were bilateral crepitations, normal heart sounds and no murmur on chest auscultation, and the absence of hepatosplenomegaly. The blood glucose level was 88 mg/dl. On putting the baby at the mother’s breast, it was observed that she had a weak suck. The breast appeared normal on examination. As we talked to the mother, trying to allay her anxiety, we learned that she had limited knowledge about how to care for her baby, including proper positioning during breastfeeding, the hazards of top feeds, and the danger signs that indicated ill-health.

We kept a presumptive diagnosis of newborn sepsis or possible serious bacterial infection (PSBI). According to the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) protocol, we administered the first dose of an intramuscular antibiotic (250-mg ceftriaxone), and kept the

baby under observation in the PHC, along with the mother. Within a few hours, the SpO₂ fell to 86% and the baby went into cardiorespiratory arrest. The baby was immediately resuscitated by intermittent positive pressure ventilation with a self-inflating bag and mask and oxygen. Within a few minutes, the baby started breathing spontaneously, and her SpO₂ improved to 96%.

It was decided to refer the mother and baby to the NICU in Udaipur, by ambulance equipped with single nursing staff, oxygen, and maintenance IV fluids to prevent hypoglycemia during the transit (that would take around 2½ hours). However, the physician and nursing staff (otherwise skilled in the healthcare of young infants) were unable to secure an IV line. We thus administered 10% dextrose (10 ml) through a nasogastric tube. During the journey, the baby continued to receive oxygen and her temperature was maintained by maintaining skin-to-skin contact with the mother, under the supervision of the accompanying health personnel.

Our staff member also helped the mother negotiate the formalities of the baby's admission to the tertiary hospital at Udaipur. After being provided with supportive care and treatment with parenteral antibiotics, the baby was discharged after a week with a diagnosis of neonatal septicemia and pneumonia. The family was advised to continue antibiotics at the nearest facility. The family brought the baby back to us at the PHC and we continued giving her supervised oral antibiotics for the next 5 days. In continuation with the lacunae that we had noted during her earlier brief stay with us, the mother and family members were counseled on Kangaroo mother care (KMC), the importance and benefits of exclusive breastfeeding, and how to recognize danger signs. The mother was reassured that her breast milk was sufficient, the proper position for breastfeeding was demonstrated, and she was given moral support until she became totally confident in feeding her baby. She was also counseled to have a nutritious diet including milk and milk products, pulses, vegetables and fruits, and plenty of water. The ANM and ASHA were notified and they started making regular home visits on alternate days for 1 week, and then fortnightly. By 2 months of age, the baby was thriving [Figure 1]. Her weight had increased to 2.35 kg on exclusive breastfeeds, and the family was satisfied.

DISCUSSION

The neonatal period is the most vulnerable period in the entire life and carries the highest risk of death. In India, while neonatal mortality has progressively declined *per se*, there are significant variations across the country. For example, the district NNMR ranges from 5.8 to 46.2, with rural areas showing much higher rates in comparison to the urban.^[5] There are even intradistrict variations, with remoter and inaccessible areas (like the one where this PHC operates), having poorer figures due to a higher and more difficult burden. Apart from the aforementioned health-care system-related issues, another major challenge is the delay in seeking health care. Verbal



Figure 1: Mother and baby at a follow-up visit

autopsies of the reasons attributing to neonatal deaths in rural India have shown that a significant proportion of mortalities occur at home or en route to the hospital. Distances, lack of transport, limited financial means and the absence of the father on account of migration make it difficult for families to seek timely care for their small and sick newborns.

The value of good quality and continued care closer home by a PHC, as reported in this case study is evident; we were able to provide in-house care (including resuscitation), facilitate timely referral by arranging transport with the necessary equipment and accompanying staff, and continued to give home-based health care and support, following discharge.

How can the PHCs play a larger role in managing small and sick newborns, especially in remote, rural areas? First, it is critical that PHC staff have the necessary skills and resources to identify signs of sickness (PSBI), initiate treatment, and stabilize babies. While facility-based IMNCI (F-IMNCI) provides the necessary guidelines for such care, it has been restricted to the staff of community health centers (CHCs) and first referral units (FRUs). Even for them, training has been single-time, follow-up has been limited, and no evaluation has been conducted after training. Training and supporting the PHC staff in the care of sick newborns, has received limited priority thus far. The existing guidelines may require adaptation for a PHC setting where a pediatrician and/or skilled newborn nurse are unavailable. (like giving fluids by a nasogastric tube when IV access is not obtained, as in this case).

A few highlights of PHC Nithauwa are worth mentioning here: our staff has received training in, and is competent in managing PSBI, and providing family counseling on KMC; we have assured availability of essential drugs including oxygen; and there is a pediatrician who is regularly available for teleconsultation (which makes the PHC team more confident in managing sick babies).

Second, we need to improve the two-way communication system between the SNCU/NICU/PHC team (doctors and nurses) and the community health team (ASHAs and ANMs)

to ensure continuity in care. In this case, the lack of information about the mother–baby being discharged from the facility where the baby was born and our community health team was most unfortunate. Timely and appropriate communication might have prevented the mother from ceasing to exclusively breastfeed, adopting poor feeding practices, and the consequent neonatal sepsis. The advantages can be seen in the second instance, when on discharge from the city NICU, proactive connect of the PHC team with the family ensured that they returned to the PHC and that care was continued at home, including KMC.

Third, there is a need for PHC teams to understand and respond to the local context and social determinants of health that prevail in the community they serve. In this case, PHC team was aware that distances, absence of fathers, and limited financial resources make it difficult for families to accept referrals. When they needed to make a referral for the baby, the team therefore acted with empathy, counselled effectively and ensured necessary transport arrangements.

Another question emerges: can the PHCs gear up for the challenge of extending quality newborn care to sick newborns? This case report demonstrates both the possibilities and the challenges that need to be faced for such an extended role. Several advances in recent years have made the possibility stronger. Newer protocols for the management of PSBI with simplified regimens and less need for injectable antibiotics; the integration of KMC in the care of small newborns; improved availability of doctors, nurses and more recently, the community health officers at health and wellness centers; all these together can help PHCs embrace the care of sick and small newborns with evidence-based medicine, competence, and confidence. Pediatricians will need to assume a significant role in helping such a transformation by training PHC teams, offering teleconsultation services and evaluating primary newborn care.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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