

## Assessment of Newborn Care Corner in Public Health Facilities of Ludhiana, India

In this cross-sectional study of 15 public health facilities in Ludhiana, India, we evaluated 22 delivery points for equipment and trained health personal available at Newborn Care Corner (NBCC) for neonatal resuscitation. NBCCs were established at all the delivery points except one, with radiant warmers in place including non-functional warmers at four (18%) delivery points. Self-inflating resuscitation bag was available at 20 delivery points but shoulder roll and masks of both sizes were available at only 4 (18%) and 5 (27%) delivery points, respectively. Only 4 (27%) facilities had round-the-clock availability of a nurse or midwife trained in neonatal resuscitation, whereas none of the facility had round the clock availability of medical officer trained in neonatal resuscitation.

**Keywords:** *Healthcare evaluation, Neonatal mortality rate, Neonatal resuscitation.*

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Neonatal resuscitation is an important intervention to reduce neonatal mortality [1,2]. It is vital that health systems are equipped with necessary supplies, and the staff members are competent enough to provide evidence-based resuscitation [3]. Indian Academy of Pediatrics (IAP) in collaboration with National Rural Health Mission (NRHM) of Government of India developed Basic Newborn Care and Resuscitation Program (BNCRP) of Navjaat Shishu Suraksha Karyakram (NSSK) adopted from Neonatal Resuscitation Program (NRP) guidelines for grassroot workers as well as pediatricians [4]. The objective of present study was to find out the availability of requisite equipment at Newborn Care Corner (NBCC) as well as health personal trained in NSSK, in public health facilities of Ludhiana district, Punjab, India.

The study was conducted in the month of July and August 2015. Fifteen out of the total 30 public health facilities of Ludhiana District, were selected as guided by the delivery load in each of the four categories *viz.*, District Hospital (one out of one), Sub-divisional hospitals (two out of four), Community Health Centers (four out of nine) and Primary Health Centers (eight out of sixteen). The ethical approval was obtained from the Institutional Ethics Committee (IEC) of Dayanand Medical College and Hospital, Ludhiana; permission from NRHM, Punjab was also obtained.

The findings of requisite equipment available for neonatal resuscitation are summarized in **Table I**. All the health facilities had medical officer, staff nurse or auxiliary nurse midwife (ANM) to conduct the delivery and provide newborn care. NSSK trained staff nurse/ANM were available round the clock at only four (2 SDH, 1 CHC, 1 PHC) out of 15 public health facilities. None of these facilities had round the clock availability of NSSK-trained medical officer. Out of the total ANM's/staff nurses and medical officers available at the time of delivery, 57% and 28% were trained in NSSK, respectively.

Of the 22 delivery points studied at 15 public health facilities, NBCC were established at all delivery points except one, with radiant warmers in place. Radiant warmers at four of these facilities were not in functioning state. Self-inflating resuscitation bag was available at 20 delivery points with mask available at 18 of these delivery points. Masks of both sizes were available at only four (18%) delivery points.

For neonatal resuscitation, the most important step is positive pressure ventilation with bag and mask [5]. A similar study from 13 CHCs from Bharatpur District of

**TABLE I** OVERALL STATUS OF FACILITY-BASED NEWBORN CARE CORNER IN LUDHIANA

<i>Equipment</i>	<i>No (%)</i>
<b>Heating Source</b>	
Availability of warmers	21 (95)
Non-functional warmers	4 (18)
<b>Availability of Resuscitation apparatus</b>	
resuscitation bag	20 (91)
Mask size 0	9 (41)
Mask size 1	13 (59)
Mask size 0 & 1	4 (18)
Availability of two clean dry sheets	16 (73)
Availability of suction/mucus extractor	21 (95)
Availability of shoulder roll	5 (23)
Availability of Oxygen/filled cylinders	17 (77)
Availability of baby weighing scale	21 (95)
<b>Availability of stethoscope</b>	
Pediatric	0
Adult	18 (82)
Availability of clock with seconds hand	17 (77)
Availability of sterile gloves	21 (95)

Rajasthan [6] reported deficiencies in the presence of equipment related to essential newborn care services. Only 3 out of 13 (23.1%) had radiant warmers, 4 out of 13 (30.8%) had resuscitators, and 9 out of 13 (69.2%) had suction pumps available in the facilities. None of the included CHCs in this assessment had fully-equipped newborn care corner [6]. In another facility-based survey in rural area of Lucknow District, Uttar Pradesh in 9 community health and 9 primary health centers, availability of essential newborn care equipment and trained personnel was grossly inadequate in almost all the PHCs [7].

This study revealed that, despite availability of NBCCs, these were not fully equipped. This calls for a change of mindset and provision of adequate sensitization of care providers using the NBCCs. Availability and functionality of necessary equipment and NSSK-trained staff to use the equipment will be important to realize the potential gains that can be achieved through provision of neonatal resuscitation – an important intervention for reducing neonatal mortality.

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#### REFERENCES

1. Navjaat Shishu Suraksha Karyakram: Basic newborn Care and Resuscitation Program Facilitator's Guide. Ministry of Health and Family Welfare, Government of India. Facilitator's guide. Available from <http://nihfw.org/pdf/NCHRC-Publications/NavjaatShishuFacGui.pdf>. Accessed January 16, 2015.
2. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de Bernis L. Lancet Neonatal Survival Steering Team. Evidence-based, cost-effective interventions: how many newborn babies can we save? *Lancet*. 2005;365:977-88.
3. Malhotra S, Zodpey SP, Vidyasagar AL, Sharma K, Raj SS, Neogi SB, *et al*. Assessment of essential newborn care services in secondary-level facilities from two districts of India. *J Health Popul Nutr*. 2014;32:130-41.
4. Maternal and Newborn Health ToolKit. New Delhi: Maternal Health Division, Ministry of Health and Family Welfare, Government of India; 2013. p.34-5.
5. Enweronu-Laryea C, Dickson KE, Moxon SG, Simen-Kapen A, Nyange C, Niermeyer S, *et al*. Basic newborn care and neonatal resuscitation: a multi-country analysis of health system bottlenecks and potential solutions. *BMC Pregnancy Child Birth*. 2015;15:1-20.
6. Sodani PR, Sharma K. Assessing Indian public health standards for community health centers: a case study with special reference to essential newborn care services. *Indian J Public Health*. 2011;55:260-6.
7. Sahu KK, Idris MZ, Agarwal M, Singh SK, Shankar P, Dixit RK. Assessment of essential newborn care services for low birth weight babies in rural Lucknow, India. *Int J Biomed Res*. 2013;4:623-7.

## Respiratory Morbidity Following Pediatric Orthotopic Liver Transplantation

We evaluated the pulmonary complications following orthotopic liver transplantation in 45 children (age <18 y). 22 patients (49%) developed respiratory complications. Pediatric end-stage liver disease (PELD) score >25 and positive fluid balance were independent risk factors. Patients with respiratory complication had significantly higher mortality and intensive care unit stay.

**Keywords:** ARDS, Complications, Pneumonia.

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**O** rthotopic liver transplantation (OLT) is the treatment of choice for children with end stage liver disease. Despite advances in intensive care and surgical techniques, respiratory

complications are frequently associated with pediatric OLT [1,2]. We retrospectively analyzed medical records of children (age <18 y) who underwent OLT during 2009-14 in a tertiary-care referral hospital in Bangalore, India.

Respiratory complications were assessed from clinical and radiological features. Pediatric end-stage liver disease (PELD) score was calculated using online calculators. Fluid balance was calculated as percentage of body weight using formulae: (total fluid in [L] – total fluid out [L] / (admission weight [kg]) × 100%. Patients were dichotomized as those with pulmonary complications and those without. Chi-square test was used to evaluate categorical data and Mann-Whitney U test for continuous data. Statistical significance was defined as  $P < 0.05$ . Univariate analysis was performed and variables with  $P < 0.05$  were entered into a multivariate logistic regression analysis to determine independent predictors. Odds ratio