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## Clinical outcome of infants younger than two months in children ward of a tertiary care hospital, Nepal

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#### ABSTRACT

**Introductions:** Newborn and young infants are most vulnerable for preventable deaths, particularly in developing countries. This study was conducted to see the clinical profile and outcome of infants less than two months of age admitted in children ward of Patan Hospital.

**Methods:** This descriptive retrospective study was conducted at Patan Hospital, over 12 months from April 2014 to March 2015. Hospital records of all admitted infants aged less than two months were reviewed. The demographic characteristics, clinical profile and clinical outcome were descriptively analyzed.

**Results:** Out of 2062 admissions in children ward, 614 (29.8%) were infants aged less than two months, out of which 482 were neonates less than 28 days. Among these neonates, 114 were inborn. Out of 436 infections, blood culture was positive in 37 (8.9%). There were 4 (0.04%) deaths, 4 (0.04%) referral and 22 (0.25%) left against medical advice. Infection 436 (436) was the commonest cause of illness, of which neonatal sepsis was 163 (37.4%), pneumonia 130 (30%) staphylococcal skin infection 39 (8.7%) and UTI 34 (7.8%). There were 71 (11.6%) cases of neonatal hyperbilirubinemia. Blood culture was positive in 55 (9%) with CONS being the commonest organism isolated; 19 (51.3%).

**Conclusions:** Children ward contributes significantly to the care of sick infants less than two months of age, especially out born ones, requiring neonatal care facility in tertiary level hospital of Nepal. As most admissions are for infection, followed by hyperbilirubinemia, pediatrics wards need to be equipped and staffed accordingly to meet the need of sick young infants.

**Keywords:** children ward, clinical profile, neonatal sepsis

## INTRODUCTIONS

Young infancy, specially the neonatal period is the most vulnerable period of life when most of the preventable deaths occur, particularly in developing countries.<sup>1</sup> Nepal has been able to reduce under-five mortality but neonatal mortality rate remains 23 per 1000 live births.<sup>2</sup>

Although sick neonates require nursery or Neonatal Intensive Care Units (NICU), they are frequently managed in general wards in the resource limited settings. The pattern of diseases in young infants like neonates is a sensitive indicator of availability, utilization and effectiveness of mother and child health services in a community.<sup>3</sup>

There is a paucity of data regarding the spectrum of illness and the outcome of neonates managed in the wards, compared to neonatal care facilities in developing countries. This study was conducted to audit the clinical profile and outcome of infants less than two months of age admitted in the children ward of Patan Hospital in Nepal.

## METHODS

This cross-sectional study was conducted at Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Nepal. The study was conducted for 12 months from April 2014 to March 2015. The inpatient hospital records of infants less than two months of age admitted in the children ward were evaluated. The demographic characteristics, clinical profile, morbidity, and treatment outcome were descriptively analyzed.

## RESULTS

Out of 2,062 admissions in the children ward of Patan Hospital over a duration of one year, 614 (29.8%) were infants less than two months, out of which 482 were neonates less than 28 days. Among these neonates, 114 were inborn. Male to female ratio was 1.33:1 (n=351:263).

Out of 614 infants, 366 (59.6%) were from Lalitpur, 147 (23.9%) from Kathmandu, 24 (3.9%) from Bhatkpur and 77 (12.5%) from outside Kathmandu Valley. Age wise, 214 (34.8%) were within one week of life, 268 (43.6%) were between 8 and 28 days, and 132 (21.5%) were between 29 days up to 2 months. The mean duration of hospitalization was 7.9 days, with a range of 1 to 51 days.

There were 8,688 live births in Patan Hospital over a period of one year, of which 890 (10.2%) got admitted either in children ward (114 or 18.5%), nurseries (519 or 84.5%) or neonatal intensive care unit (NICU).

There were 114 (18.5%) inborn neonates admitted to children ward during the birth hospitalization. Out of the inborn neonates admitted in children ward, 32 (28%) were transferred from NICU while remaining 57 (50%) were transferred from nurseries, 25 (21.9%) were inborn who went home and were re-admitted.

All neonates admitted in NICU were inborn. In nursery, 519 (84.5%) were inborn.

Regarding the outcome, 4 infants less than 2 months of age expired in the children ward, 2 of them being early neonatal death up to 7 days of birth and 2 were post neonatal death i.e. after 7 days and up to 28 days.

Among 614 infants within 2 months of age admitted to children ward, 52 (8.5%) required NICU and paediatric ICU (PICU) care, and 42 (6.8%) babies required Nursery care at some point in hospital stay.

There were 4 babies referred to other centres and 22 left against medical advice. In the same period, there were 23 mortalities in nurseries and 31 mortalities in NICU. Similarly, 42 babies from nurseries and 3 babies from NICU were transferred to other centre.

There were 436 (71% of 614) infants admitted for infection. Among infection, neonatal sepsis were 163 (37.4%), pneumonia 130 (29.8%), meningitis 49 (11.2%), staphylococcal skin infection 38 (8.7%), urinary tract infection (UTI)

34 (7.8%), acute gastroenteritis 8 (1.8%), umbilical infection 4 (1%), cellulitis 3 (0.7%), breast abscess 3 (0.7), necrotizing fasciitis 2 (0.4%), acute suppurative otitis media (ASOM) 2 (0.4%) and other less common foci of infection.

Out of 436 infections, blood culture was positive in 8.98% (37 of 412 blood cultures). Coagulase negative staphylococcus (CONS) was isolated in 19 (51.3%), rest were Acinetobacter, Enterobacter and Staphylococcus aureus and Klebsiella. Three out of 9 repeat blood cultures yielded organisms. Urine culture was positive in 3 out of 23 specimens. Four out of 30 other cultures (CSF, swab) were positive.

Among 614 infants, 71 (11.6%) were admitted with hyperbilirubinemia for phototherapy, and 26 preterm/intrauterine growth retardation (IUGR) for supportive therapy. Others were 15 congenital anomalies, 8 seizure without identified cause, 7 respiratory distress syndrome (RDS), 5 birth asphyxia, 2 transient tachypnea of newborn (TTN), 1 meconium aspiration syndrome (MAS).

## DISCUSSIONS

Significant proportion (29.8%) of 614 infants less than 2 months of age admitted in children ward required special care, including NICU and nursery.

In the children ward most of the admitted infants were born outside Patan Hospital, only 114 were inborn neonates. However, there were no inborn neonates admitted directly to children ward and no out born neonates admitted in NICU (this is hospital policy not to contaminate NICU from community acquired infection), which reflects a strict admission policy of the hospital regarding the place of delivery of sick neonates.

This finding is in contrast with findings reported in a similar study<sup>4</sup> from a university hospital outside Kathmandu, with 10,000 deliveries a year and similar pediatric services. They report out of 3,088 neonatal admissions over two years period, nearly three-fourth (n = 2,258)

were admitted in general pediatric wards and 60% of 983 sick inborn neonates were admitted directly in pediatric wards suggesting overload in neonatal units to accommodate all sick inborn neonates.

In our study, the mortality of young infant below two months of age in the children ward was only 0.65%, as the sicker babies would get transferred to nursery or NICU. The mortality rates were 2.8% and 27.4% respectively in nursery and NICU. Two early neonatal deaths occurred in ward due to complications of extreme prematurity and of birth asphyxia, as they could not be transferred to NICU or other centre. The other 2 deaths in post-neonatal period were from severe sepsis. This finding was in contrast to BPKHS<sup>4</sup> where in-hospital neonatal mortality was 248 (8% of total 3088 neonatal admission), of which 169 occurred in the wards and rest in NICU or nursery.

The pattern of illness in infants admitted to children ward was different than in nurseries and NICU. Infection (71%, n=436) was predominant cause of illness in children ward. Among infection, neonatal sepsis, pneumonia, UTI, meningitis and Staphylococcal skin infection were five most common illnesses. In studies among neonates, sepsis accounted for 41% of morbidity in Pakistan and 21% in South Africa.<sup>5</sup> We had 11.5% (n=71) infants with neonatal hyperbilirubinemia admitted for phototherapy which is lower than reported from Pakistan (36%), India (54%) and Bangladesh (23%).<sup>5</sup>

The large burden of sepsis and high culture positivity for CONS (51.3%) in our findings warrants serious steps towards aseptic techniques and infection prevention in children ward.

This was a retrospective study based on hospital records of admitted infants. This may not include sick infants presenting to emergency department and not getting admitted due to non-availability of beds. A prospective study may provide complete picture of neonatal care including spectrum of illness, nature of intervention and outcome.

Considerations for ward setting, equipments, human resources and management protocol may help reduce morbidity and mortality of infants.

## CONCLUSIONS

Children ward contributes significantly to the care of sick infants less than two months of age, especially out-born who require neonatal facility. Infection was commonest cause of admitted infants, followed by need for phototherapy.

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