

## Original Research Article

# Morbidity profile and outcome of neonates admitted in a secondary level SNCU in district Udhampur in Jammu and Kashmir

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## ABSTRACT

**Background:** Infant mortality is an important indicator of healthcare system of the country and neonatal mortality contributes a major proportion to infant mortality. So this study was undertaken to study the demographic and morbidity profile and outcome of neonatal care in our area.

**Methods:** This study, a retrospective observational study was conducted in district hospital Udhampur which caters to a population of around 5.5 lakh. Case records of all SNCU (special newborn care unit) admissions between January 2018 to December 2018 were analysed in a pre-designed proforma which included identity, clinical and demographical variables, admitting complaints, diagnosis, treatment, hospital stay and outcome.

**Results:** Of the total 364 neonates with an average birth weight of 2.67 kgs, 70.60% were of weight over 2.5 kg. The most common diagnosis included sepsis (27.74%), neonatal hyperbilirubinemia (13.18%) and RDS (respiratory distress syndrome) (10.43%). Discharge rate was 60.71% with mortality of 3.26% and referral rate of 31.31%.

**Conclusions:** Sepsis and RDS as the most common cause of morbidity in our setup indicate that improvement in community as well as hospital hygiene along with improved antenatal care and maternal health needs to be stressed upon to prevent them.

**Keywords:** Infant, Neonate, Sepsis, SNCU

## INTRODUCTION

The current neonatal, infant and under five mortality rates in our country are 22, 28 and 34 per 1000 live births and have improved considerably over last few years.<sup>1</sup>

Neonatal mortality is one of the main contributors to infant mortality and under five mortality in India as well as other countries. Facility based newborn care (FBNC) programme is one of the key initiatives launched by the government of India under the national rural health

mission and RMNCH and a strategic programme to improve the status of newborn health in the country. Under the programme, efforts are being made to provide different level of newborn care at the health facilities. While newborn care corners (NBCCs) have been established at all delivery points to provide essential newborn care, newborn stabilization units (NBSUs) have been established at all community health centres/first referral units for management of selected newborn conditions and to stabilize serious and sick newborns before referral to higher centres.

SNCUs have been established at district hospitals and subdistrict hospitals with annual delivery load of more than 3000 to provide care for sick newborns, that is, all type of neonatal care except assisted ventilation and major surgeries. It is a separate unit in close proximity to the labour room and managed by adequately trained doctors, staff nurses and support staff to provide 24×7 services.<sup>2</sup>

With the single digit target of infant mortality rate in 2030, tremendous growth of neonatal intensive care is required, involving setting up of new NICU's and strengthening of already existing SNCUs.<sup>3</sup> The priority of healthcare officials is to direct the resources for improving SNCUs to bring down neonatal mortality.

The neonatal mortality profile has gone a paradigm shift over the past decades. The primary cause of neonatal mortality is now prematurity and associated complications unlike birth asphyxia and neonatal sepsis which constituted the major chunk of neonatal mortality decades ago.<sup>4</sup> With the proliferation of secondary and tertiary neonatal care in tier 1 cities, there has been dramatic improvement in survival of LBW (low birth weight) and VLBW (very low birth weight) babies in these cities. However with scarcity of pediatricians, trained doctors, nurses at SNCU level, system needs to be strengthened in tier 2 and 3 cities and districts to improve survival of such babies in small cities.

There are very few studies describing the morbidity and mortality profile of SNCUs of smaller cities in northern India. This study was undertaken to determine the demographic profile, presentation and outcome of neonates admitted in one such SNCU in north India in order to guide us to improve and strengthen the existing SNCUs.

## METHODS

The retrospective observational study was done in SNCU of district hospital Udhampur. District hospital Udhampur is a 200 bedded hospital located in district Udhampur of union territory of Jammu and Kashmir. The hospital has an SNCU catering to a population of around 5.5 lakh with in house delivery rate of around 3500 per year. Being the only neonatal care centre in the district, this SNCU caters to all strata of society. The SNCU is being looked after by pediatricians posted in the district hospital. It is equipped with radiant warmers, phototherapy, centralized oxygen and KMC support with biochemical and pathology laboratory support, X-ray and ultrasound facility.

This study was conducted by analysing case records of all SNCU admissions for a period of one year (January 2018 to December 2018) in a pre-designed proforma which

included identity, clinical and demographical variables, admitting complaints, diagnosis, treatment, hospital stay and outcome. Admission criteria in SNCU included babies born to gestation less than 34 weeks, birth weight less than 1.5 kg (regardless of gestation), evidence of birth asphyxia which included Apgar score less than 6 at 1 minute or prolonged resuscitation requiring bag and mask ventilation or intubation, persisting respiratory distress, shock or CRT more than 2 seconds, central cyanosis, persistent vomiting, feeding problems, neonatal apnea or cyanotic spells, letharginess, seizures, jaundice requiring intervention or any surgical condition requiring intervention or any other neonate who is felt to be at risk by the duty staff. All neonates who were perceived to be unmanageable by the consulting pediatrician were referred to higher centre for further management. Necessary ethical permission was taken from the institute.

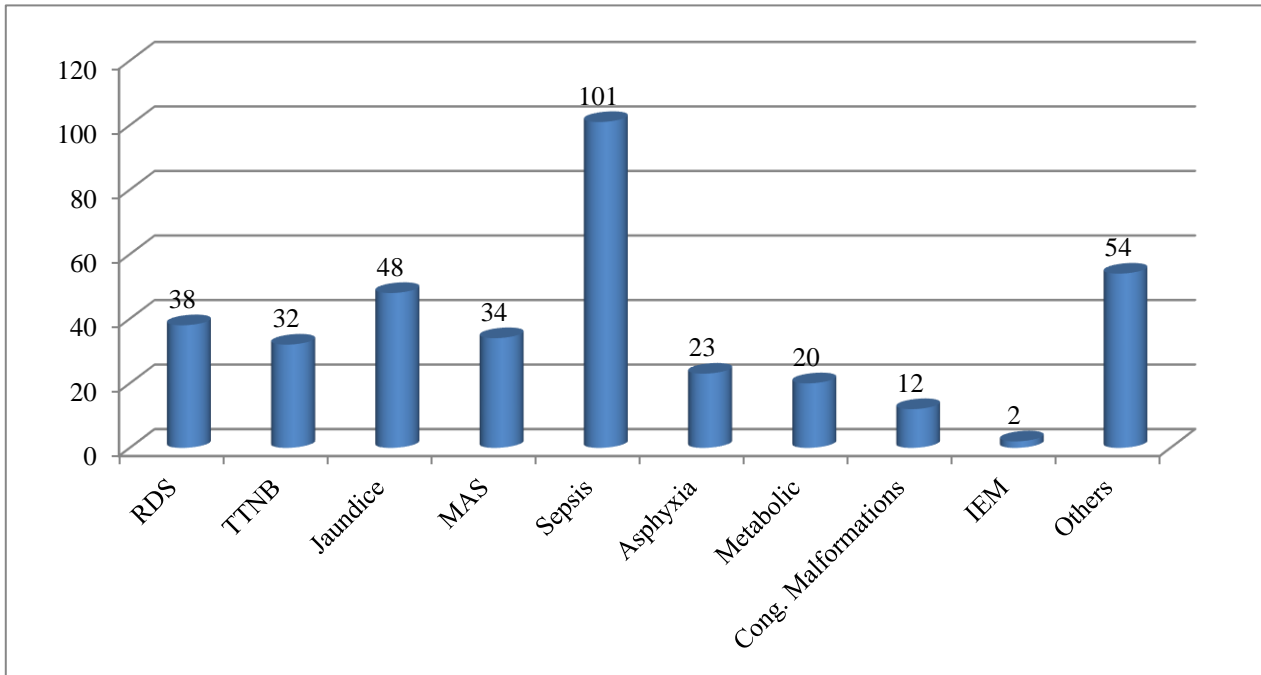
The data collected was compiled and entered in MS excel and analysed using appropriate statistical tools in software SPSS-18. Continuous variables were expressed as (mean±standard deviation) whereas categorical variables were expressed as frequency (in percentage).

## RESULTS

A total of 364 neonates were admitted during the study period with average duration of stay of 2.83±1.78 days for non-referred patients. 251/364 (68.95%) were inborn whereas 113/364 (31.04%) were outborn. Male to female ratio was 220:144. Most of the admissions 206/364 (56.59%) occurred in first day of life, 113/364 (31.04%) occurred within day 1-7 of birth, whereas 45/364 (12.36%) admissions occurred after first week of birth. Mean age at admission was 2.86±5.27 days. Average weight of babies admitted in SNCU was 2.67±0.67 kg of which 107/364 (29.39%) were LBW babies. Of these LBW babies 88/364 (24.17%) were of weight between 1.5<2.5 kg and 13/364 (3.57%) were of weight between 1 <1.5 kg and 6/356 (1.64%) were of weight less than 1 kg (Table 1).

Out of 354 infants 38 (10.43%) were RDS (respiratory distress syndrome), 32 (8.79%) were TTNB (transient tachypnea of newborn), 48 (13.18%) were neonatal hyperbilirubinemia requiring phototherapy, 34 (9.34%) were MAS (meconium aspiration syndrome), 23 (6.31%) were birth asphyxia, 2 (0.54%) were suspected inborn of metabolism, 20 (5.49%) were of metabolic disorders including hypoglycemia and hypocalcemia, 12 (3.29%) were of congenital malformations while the maximum contribution 101 (27.74%) was of sepsis (Figure 1).

Discharge rate of SNCU was 60.71% (221/364) with referral rate of 31.04% (113/364). Mortality rate was 3.26% (12/364) whereas patients who went LAMA were 4.94% (18/364) (Table 2).



**Figure 1: Morbidity profile of admitted neonates.**

**Table 1: Demographic profile of admitted neonates.**

Variables	Value	Percentage
<b>Admission</b>		
Inborn	251	68.95
Outborn	113	31.04
<b>Gender</b>		
Male	220	60.43
Female	144	39.56
<b>Age at admission (in days)</b>		
≤1	206	56.59
1-7	113	31.04
>7	45	12.36
<b>Weight (in kgs)</b>		
<1	6	1.64
1-1.5	13	3.57
1.5-2.5	88	24.16
≥2.5	257	70.60

**Table 2: Outcome of admitted neonates.**

Outcomes	Values	Percentage
<b>Discharged</b>	221	60.71
<b>Referred</b>	113	31.04
<b>LAMA</b>	18	4.94
<b>Expired</b>	12	3.26

**DISCUSSION**

The demographic distribution of neonates in this study is in concordance to other studies. Inborn to out born ratio was 68.95% versus 31.04%, which is similar to other

studies (69.2% versus 30.8%, 71.7% versus 28.3%, 75.6% versus 24.5%).<sup>5-7</sup> This probably reflects the ease of access to hospital for inborn babies. The study shows a higher male to female ratio (220:144) similar to previous studies.<sup>8,9</sup> This may be because of the community bias

towards the male child. Most of the admissions occurred on day 1 of life probably implicating the fact the perinatal and immediate postnatal complications are the major cause of admissions in SNCUs. Average weight of  $2.67 \pm 0.67$  kgs which is near to the national standards and reported in other studies.<sup>10</sup>

The predominant cause of admissions in our study were sepsis, jaundice, RDS and TTNB which is consistent with many other studies.<sup>6,10</sup> In national neonatal perinatal database, systemic infections (28.4%), hyperbilirubinemia (27.9%), seizures (11.7%), hypoglycemia (11.5%), hypoxic ischemic encephalopathy (8.3%), anemia (8.9%) and hypocalcemia (8.6%) were common morbidities observed.<sup>11</sup> Studies from Africa show more admissions due to sepsis, jaundice and tetanus.<sup>12-14</sup> In the developed countries, the scenario is different with extreme prematurity, asphyxia and congenital anomalies being the chief causes as seen in a study in Canada by Simpson et al.<sup>15</sup>

Our SNCU has a discharge rate of 60.71% whereas discharge rate of 60-80% has been reported in various other studies.<sup>16</sup> Referral rate of 31.04% and mortality rate of 3.26% represents low mortality and high referral rate. Referral rates from SNCU's have varied across the country with various studies reporting referral rates from 4.58% to 22.8%.<sup>17,18</sup> Mortality rates in other SNCU's have been 5.53%-12%.<sup>5,19</sup> Low mortality and high referral rate probably reflects the ease with which patients could be transported to a tertiary care centre which is within a drive of 70 mins from our place.

### Limitations

Being a retrospective study, this study was subjected to lack of accuracy related to documentary errors. The actual rate of neonatal deaths may be higher than those reported in the study due to high referral rate. Collaboration with referral centre needed to be done to determine the actual mortality rate.

### CONCLUSION

As compared to western world where prematurity and congenital anomalies predominate, presence of sepsis as prominent cause of admissions still make us ponder that we are still far behind and need to improve a lot as a community as far as hygienic measures are concerned. All aseptic precautions need to be strengthened in hospitals well as community in order to prevent such cases. Improved antenatal care and maternal health needs to be stressed upon to decrease preterm deliveries in order to prevent RDS. Data from this study will act as a baseline for comparisons in future. With high referral rate, SNCU needs to be equipped with qualified paediatricians, trained medical officers and nurses to deal with sick babies in order to avoid unnecessary referrals. Respiratory support of babies in SNCU's need to be

improved so that more of RDS cases can be managed at SNCU level avoiding undue referrals and mortality.

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