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Original Research Article

Clinical profile of admitted sick neonates at special newborn care units in Odisha, India

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ABSTRACT

Background: The facility-based newborn care (FBNC) program is a strategic program that improves newborn health status in India. We described the morbidity and mortality portfolios of SNCU graduates.
Methods: Using data from the SNCU online database(https://sncuindiaonline.org), we carried out a cross-sectional descriptive study of newborns received care at SNCUs of 10 aspirational districts (District-Hospitals) in Odisha for four calendar years, 2020–2023. We profiled the admissions by age, gender, weight, maturity, place of delivery and morbidity and described critical outcomes like mortality, referral and discharge.
Results: A total of 69847 newborns were admitted. Males were predominant (40530,58%). Outborn were more than Inborn (35422,51%). Preterm was 48.5% (n=33886). 31632 (45%) were in LBWs (1500-2499 gm). HIE/Birth Asphyxia (n=19814, 28%) was the major morbidity of the SNCU graduates. The median average duration of stay was four days (0-98 days). Out of all admitted, 77% (n=53612) got discharged, 11% were referred, 9% died and 3% were Left Against Medical Advice. The top cause of mortality was Birth Asphyxia (n=2711, 42%).
Conclusions: Asphyxia prevention and management requires immediate attention and can be achieved through community-based interventions to raise the awareness level of the intended beneficiaries and better capacity building of health workers.

Keywords: SNCU, Birth asphyxia, Morbidity, Mortality

INTRODUCTION

Neonatal mortality accounts for over two-thirds of baby fatalities and half of deaths among children under five in India.[1] The facility-based Newborn Care program is one of the key initiatives launched by the Government of India under the National Rural Health Mission and RMNCH+A strategic program to improve newborn health status in India. Under the program, efforts are being made to provide different levels of newborn care at health facilities.

Over the past ten years, neonatal care provided in facilities has grown significantly in India. More than 700 Special Care Newborn Units (SNCU) have been operational nationwide since its inception in 2003.[2] Odisha is a leading State in Infant Mortality Rate in India. As per SRS 2022, the IMR of Odisha is 36, compared to 28 in India. The Government of Odisha has implemented a number of interventions that have been shown to increase newborn survival, such as comprehensive antenatal care, skilled attendance at birth, resuscitation at birth and essential newborn care for tiny and ill newborns, which includes

provision of critical care at health facilities through Special Newborn Care Units (SNCUs) and Newborn Stabilisation Units (NBSUs), Home Based New Born Care(HBNC) and Integrated Management of Neonatal and Childhood Illnesses (IMNCI).

The SNCU is a neonatal unit near the labor room, which provides all specialized care, except assisted ventilation and major surgery, for sick newborns. Any facility with more than 3,000 deliveries per year should have an SNCU, which includes most district hospitals and some sub-district hospitals.[3] A web-based data management and tracking system known as "SNCU online" was built at each SNCU in 2011 by the government of India with UNICEF's assistance. It is currently being maintained across all SNCUs in India and Odisha. The admission and treatment of numerous infants generate significant data, such as demographic information, anthropometric and vital statistics, admission criteria, treatment profiles, result status, bed occupancy, etc. The information is regularly entered into the SNCU online program with the goal of enhancing the standard of treatment in SNCUs. Based on the annual delivery load, the State has constructed 44 Special Newborn Care Units

(SNCU) to treat critically ill infants at various medical college hospitals, district hospitals and sub-divisional hospitals. The objectives of our study were to describe the clinical profiles, i.e., morbidity and mortality profiles of admitted neonates, at 10 District Hospitals in Odisha, 2020-2023.

METHODS

By using secondary data from the SNCU online database (https://sncuindiaonline.org), we carried out a cross-sectional descriptive study of all newborns who received care at Special New Born Care Units (SNCUs) of the District Hospitals of 10 aspirational districts in Odisha for four calendar years 2020–2023. The UNICEF has developed a portal for the Health Department to record real-time data on admission, discharge and follow-up. We downloaded the data from the SNCU Online Portal in MS Excel; the desired variables were extracted and analyzed in MS Excel 2021.

The variables extracted were month-wise admission patterns, age, gender, place of delivery, mode of transport to the facility, type of admission, maturity, birth weight, the indication of admission, duration of stay, final diagnosis, outcome category, cause of referral and cause of death.

The secondary data was collected on the SNCU babies of the ten aspirational districts of Odisha (i.e., Balangir, Dhenkanal, Gajapati, Kalahandi, Kandhamal, Koraput, Malkangiri, Nabarangpur, Nuapada, Rayagada,). Necessary permission for the study and ethical clearance was obtained from the Dept. of Health and Family Welfare Govt. of Odisha.

We profiled the admissions by Age, Gender, Weight and Maturity of babies, the reason for admission, final diagnosis, etc. and described the critical outcomes like mortality, referral and discharge. Data Analysis was done in Epi-Info 7.2.5.0 softtware

Inclusion criteria

All newborns admitted in the 10 SNCUs from January 2020 to December 2022 are included in the Study.

Exclusion criteria

All newborns admitted in the 10 SNCUs from January 2020 to December 2022 are included in the Study, so there is no exclusion.

RESULTS

Table 1 shows that out of 69847 neonatal admissions, 34425 neonates (49%) were from the same facility (Inborns) and 35412 (51%) admitted neonates were from the other facility (Outborns). SNCU Balangir (17%), Kalahandi (14%) and Rayagada (13%) were the major contributors to neonatal admissions. As shown in table 2, during 2020–2023, 69847 newborns were admitted to the 10 SNCUs.

Of all newborns in the age group, 33815 (48%) belong to 1 to 3 years. In the gender category, 29317 (58%) were female. There are 34425 (49%) admissions to the inborn unit and 35422 (51%) admissions to the outborn unit. There were 33886 (48.5%) preterm births (<37 weeks). 31632 neonates (45%) were Low Birth Weight Babies (1500-2499 gm).

The reason for admission of the Neonates at the SNCUs, 2020-2023: Hypoxic Ischaemic Encephalopathy / Birth asphyxia constituted the majority of the neonates' final diagnoses (19814 neonates, 28%). Neonatal Jaundice requiring phototherapy (14396, 21%) and sepsis/Pneumonia/Meningitis (8472, 12%) were the primary reasons for hospitalization at the SNCUs.

Birth Asphyxia of the admitted neonates (Inborn vs Out Born) 2020-2023: The majority of the admissions at the SNCUs were Hypoxic Ischaemic Encephalopathy / Birth asphyxia (19814, 28%). Of that, 11312 (57%) neonates were Inborn and 8502 (43%) were outborn.

Duration of stay of admitted Neonates,2020-2023: The median average duration for newborns hospitalized in the SNCUs is four days, ranging from 0 to 98 days.

The outcome of the admitted Neonates, 2020-2023: Out of the 69847 neonates admitted, 53612 (or 77% of the total) were well enough to be discharged, 7424 (or 11% of the total) were sent to higher-level hospitals for better care, 6495 (or 9% of the total) were pronounced dead and 2316

(or 3% of the total) were left against medical advice (LAMA).

The reasons for the mortality of admitted neonates, 2020-2023: A total of 6495 (9%) died of the 69847 neonates admitted. The top five causes of death for the admitted infants were HIE/Birth Asphyxia (2711, 42%), Neonatal sepsis/pneumonia/meningitis (1449, 22%) and Prematurity (1334, 21%).

Age at death, 2020-2023, 4513 (69%) neonates died at the age of 1-6 days. 1072(17%) neonates died at<1 day age and 910 neonates (14%) died at more than seven days.

Table 1: SNCU-wise neonatal admissions (n=69847), 2020-2023.

SNCU Name	Total neonate admissions	Same facility (in born)	Other facility (out born)	No of beds
SNCU DHH Balangir	11823	5934 (50%)	5889 (50%)	24
SNCU DHH Dhenkanal	5402	2740 (51%)	2662 (49%)	12
SNCU DHH Gajapati	4407	2609 (59%)	1798 (41%)	24
SNCU DHH Kalahandi	9501	5181 (55%)	4320 (45%)	24
SNCU DHH Kandhamal	5948	3237 (54%)	2711 (46%)	12
SNCU SLNMCH Koraput	9144	4444 (49%)	4700 (51%)	12
SNCU DHH Malkangiri	5215	2163 (41%)	3052 (59%)	24
SNCU DHH Nabarangpur	6034	2882 (48%)	3152 (52%)	12
SNCU DHH Nuapada	4878	2019 (41%)	2859 (59%)	24
SNCU DHH Rayagada	7495	3216 (43%)	4279 (57%)	24
Total	69847	34425 (49%)	35422 (51%)	192

Table 2: Profile of admitted neonates (n=69847), 2020-2023.

Characteristics	Number (N)	Proportion (%)
Age group		
<1 day	4829	7
1 to 3 days	33815	48
4 to 7 days	21963	32
>7 days	9240	13
Gender		
Male	40530	58
Female	29317	42
Delivery location		
In Born	34425	49
Out Born	35422	51
Gestation		
Full-term (>37 weeks)	35961	51.5
Pre-term (<37 weeks)	33886	48.5
Birth weight		
Extremely low birth weight (<1000 gm)	1424	2
Very low birth weight (1000-1499 gm)	7202	10.3
Low birth weight (1500-2499)	31632	45.3
Normal weight babies	29589	42.4
Morbidity profile		
Hie/birth asphyxia	19814	28
Neonatal jaundice requiring phototherapy	14396	21
Sepsis/pneumonia/meningitis	8472	12
Others	21463	31
Respiratory disease syndrome of newborns	1995	3
Congenital malformation	1547	2
Meconium aspiration syndrome	1329	2
Hypothermia	536	1
Hypoglycaemia	295	0

Continued.

Characteristics	Number (N)	Proportion (%)
Final outcome		
Discharge	53612	77
Referral	7424	11
Left against medical advice	2316	3
Died	6495	9
Mortality profile (n=6495)		
HIE/ moderate-severe birth asphyxia	2711	42
Sepsis/ pneumonia/ meningitis	1449	22
Prematurity	1334	21
Respiratory distress syndrome	516	8
Others	485	7
Age at death profile (n=6495)		
<1 day	1072	17
1-6 days	4513	69
≥7 days	910	14

DISCUSSION

During the study period (from January 2020 to December 2023), 69847 neonates were admitted to the SNCU. 34425 (49%) were inborn, i.e., born at the same facility, whereas 35422 (51%) were outborn, i.e., born at other health facilities or homes. The study shows that inborn and outborn admissions are the same, around (50%). The results are not similar to the study of Randad et al, (inborn 76.46% and outborn 23.54%), Sridhar et al, (inborn 71.71% and outborn 28.29%) and Kumar et al, (inborn 60.80% and outborn 39.20%) where inborn admissions were more than outborn's.[4-6] This proves that early referral of neonates from primary-level facilities to SNCU is good.

Males get more attention on the part of caregivers and are brought to the hospital to seek health services. This was also evident in our study, as around 58% of the study cohort were male. Several studies undertaken in various parts of India have demonstrated a male majority among admitted neonates, as has the current study. Male predominance may be related to male gender vulnerability. Still, it is also owing to social and cultural settings in India, where family members give male youngsters more attention and are preferentially brought to health facilities.

The reason for admission of newborn asphyxia was 28%. Anupama et al, study in Silchar, Assam revealed 11.65%, while Rahman K et al, investigation in Tezpur, Assam revealed 28.7%.[7,8] Inborn newborns had a greater prevalence of birth asphyxia compared to outborn babies (57% vs. 43%). It could be brought on by insufficient prenatal and intra-natal care, ineffective neonatal resuscitation, delayed referrals of high-risk mothers and restricted access to medical services.

In the present study, 77% of neonates admitted to SNCU were discharged after successful management and comparable results were recorded by Sinha et al, (84.30%), Ravikumar et al (83.39%) and Saharia et al, (85.39%) in their study.[9-11] The mortality rate in this study was 9%, less than that of Ravikumar et al (10.4%), Saharia et al (13.00%), Verma et al, (11.00%) and Shah et al, found a greater mortality rate (16.00%).[10-12,14] In Gujarat, Randad et al, (1.55%) and Sinha et al (0.9%) found a lower mortality risk among hospitalized neonates in Bihar and Mumbai.[4,9] Apart from the clinical status of newborns, recovery and mortality are affected by the availability of qualified health personnel, specialized equipment and medicines, as well as prompt admission and intervention.

These issues must be studied and considered while designing and implementing SNCU services. Adikane et al, (65.89%) and Harsh Shah et al, (67.00%) observed a lower discharge rate than the present study.[13,14] 566 (11%) newborns were referred to a higher center for additional specialist surgical and/or critical care since these facilities were inaccessible at SNCU. Left against medical advice (LAMA) cases were 3%. In their studies, Sinha et al (9.5%) and Shah et al (10.00%) Baruah and Panyang (6.58%), Sharma and Gaur (7.89%), discovered high rates of newborns left against the medical recommendation.[9,14-16]

LBW (birth weight<2500 g) and preterm (gestational age<37 weeks) harm neonatal survival and well-being. Among all hospitalized babies, 59% were LBW, which was close to the findings of Kumar et al, (61.52%), Verma et al, (61.6%), Shah et al, (63.00%) and Baruah and Panyang (66.10%) found that almost 60% of SNCU neonates were LBW.[6,12,14,15]

Such a high proportion of LBW neonates is concerning, implying an urgent need to increase community-level intervention to modify linked social, maternal (particularly related to maternal nutrition) and biological factors to minimize LBW prevalence. Simultaneously, Randad et al, observed a considerably lower proportion of LBWs in Mumbai (39.18%) and Sinha et al, in Bihar (27.6%).[4,9]

48% of admitted newborns were preterm, similar to Shah et al, (48.00%), Verma et al, (37.00%) and Kumar et al, (30.06%).[6,14]

The study was retrospective and the quantity and depth of information in the entered data determined the results. There might be a lack of accuracy due to incomplete data and mistakes in the documentation.

CONCLUSION

The most frequent reason for SNCU admission was perinatal asphyxia (19814, 28%), which was followed by neonatal jaundice requiring phototherapy (14396, 21%) and sepsis/pneumonia/meningitis (8472, 12%). Additionally, the most frequent cause of death and referral was birth asphyxia. Asphyxia prevention and management require immediate attention, which can be achieved through community-based interventions to raise the awareness level of the intended beneficiaries and better capacity building of health workers. This is the first research to gauge the standard of care provided by district hospitals with SNCUs in Odisha State's aspirational districts. Strategies for preventing low birth weight are required. Data to be timely analysed to identify key gap areas for improvement and disseminate down the line for better effective and productive outcomes.

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REFERENCES

1. Saini N, Chhabra S, Chhabra S, Garg L, Garg N. Pattern of neonatal morbidity and mortality: a prospective study in a district hospital in Urban India. J Clin Neonatol. 2016;5(3):183-8.
2. Delhi N. Ministry of Health and family welfare. Government of India. 2001:7-30.
3. Thukral A, Gupta V, Chawla D, Kumar P, Deorari AK. Multimodal Training Tool for Premature Care. 2011.
4. Randad K, Choudhary D, Garg A, Jethaliya R. Pattern of neonatal morbidity and mortality: A retrospective study in a special newborn care unit, Mumbai. Indian J Child Health. 2020;7:299-303.
5. Sridhar PV, Thammanna PS, Sandeep M. Morbidity pattern and hospital outcome of neonates admitted in a tertiary care teaching hospital, Mandya. Int J Sci Stud. 2015;3:126–9.
6. Kumar S, Ahmed M, Anand S. Morbidity and mortality patterns of neonates admitted to neonatal intensive care unit in tertiary care hospital, Bhopal. Pediatr Rev. 2016;3:776-8.
7. Anupama D, Bidyut BN, Anjana TN. Morbidity and mortality profile of newborns admitted to the neonatal intensive care unit of a tertiary care teaching hospital of Assam. J Med Sci Clin Res. 2020;8:697-702.
8. Rahman K, Begum R. Morbidity and mortality profile of neonates admitted in a special care newborn unit of a tertiary care teaching hospital of Assam, India. Indian J of Obgyn. 2020;7(1):82-7.
9. Sinha RS, Cynthia DS, Kumar PV, Armstrong LJ, Bose A, George K. Admissions to a sick new born care unit in a secondary care hospital: Profile and outcomes. Indian J Public Health. 2019;63:128-32.
10. Ravikumar SA, Elangovan H, Elayaraja K, Sunderavel AK. Morbidity and mortality profile of neonates in a tertiary care centre in Tamil Nadu: A study from South India. Int J Contemp Pediatr. 2018;5:377-82.
11. Saharia NP, Deka A, Vivekananda MS. Mortality and morbidity pattern of neonatal ICU of Gauhati Medical College and hospital. IOSR. 2016;15:73-5.
12. Verma J, Anand S, Kapoor N, Gedam S, Patel U. Neonatal outcome in new borns admitted in NICU of tertiary care hospital in central India: A 5 year study. Int J Contemp Pediatr. 2018;5:1364-7.
13. Adikane H, Surwase K, Pawar V, Chaudhari K. A prospective observational study of morbidity and mortality profile of neonates admitted in neonatal intensive care unit of secondary care centre in central Maharashtra, India. Int J Contemp Pediatr. 2018;5:1403-8.
14. Shah HD, Shah B, Dave PV, Katariya JB, Vats KP. A step toward healthy newborn: An assessment of 2 years' admission pattern and treatment outcomes of neonates admitted in special newborn care units of Gujarat. Indian J Community Med. 2018;43:14-8.
15. Baruah MN, Panyang PP. Morbidity and mortality profile of newborns admitted to the special care newborn unit (SCNU) of a teaching hospital of upper Assam, India-a three-year study. JMSCR. 2016;4:11689-95.
16. Sharma AK, Gaur A. Profile of neonatal mortality in special newborn care unit of tertiary care hospital. Int J Contemp Pediatr. 2019;6:2319-25.

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