

Original Research Article

Admission Pattern of Newborns admitted in special newborn care unit: an observational from North West of India

Girish Kumar*, Abhilash Sood, Nivedita Sharma, Vandana Sharma, Amit Kumar

Dr. R. K. G. Medical College, Hamirpur Himachal Pradesh, India

Received: 25 August 2022

Revised: 15 September 2022

Accepted: 26 September 2022

*Correspondence:

Dr. Girish Kumar,

E-mail: drgirishsharma70@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Globally, neonatal deaths constitute 44% of all deaths in less than 5 years age group. The concept of SNCU is based on the learning from the "Purulia model". This research study was undertaken, to assess the profile of sick newborns admitted in the SNCU.

Methods The investigators analyzed this data and establish the morbidity profile of newborns admitted in SNCU Hamirpur in 2019.

Results: Total of 422 newborns were admitted 197 (46.7%) were females and 225 (53.3%) were males. Out of these 381 (90.3%) were inborn and 41(9.7%) were out born. In inborn 293 (76.9%) weighed more than 2.5 kg, 83 (21.8%) were low birth weight <2.5 kg to 1.5 kg and 2 (0.52%) were very low birth weight i.e < 1.5 kg to 1 kg and one newborn was extreme low birth weight i.e <1 kg. In the out born group, 23 (56.1%) weighed more than 2.5 kg and 13 (31.8%) were low birth weight <2.5 kg to 1.5 kg, 4 (9.8%) were very low birth weight < 1.5 kg to 1 kg. Jaundice was the most common neonatal condition 63%, infection 9.5%, respiratory diseases 9% and birth asphyxia 7.8%.

Conclusions: The most sensitive time for morbidity and mortality development is during the newborn period. The main reasons for SNCU hospitalisation include neonatal jaundice, preterm, low birth weight, perinatal asphyxia, and infection. Neonatal Jaundice continues to be the primary reason for both inborn and outborn newborns admission to SNCU, and inborn babies make up the majority of this group.

Keywords: SNCU, Morbidity profile, Hyperbilirubinemia, Inborn, Outborn

INTRODUCTION

The concept of special newborn care unit (SNCU) is based on the learning from the "Purulia Model" of the last decade when the first SNCU was developed.¹⁻³ Globally, neonatal deaths constitute 44% of all deaths in the less than 5 years age group.⁴ In India, neonatal mortality contributes to almost two-thirds of infant deaths and half of the under-five deaths.⁵ Current Neonatal Mortality Rate (NMR) in India and Himachal is 25/1000 live

births.⁶⁻⁷ In Hamirpur district Neonatal Mortality Rate (NMR) is 24.6.8

This SNCU was established during 2014-2015 in the Regional Hospital subsequently, it was upgraded to a teaching and training institute. Since then, it is providing modern scientific neonatal care to sick inborn and out-born newborns. This study was undertaken to assess the morbidity profile of sick newborns admitted to the SNCU.

METHODS

Study type, location and duration

Current study was a descriptive ecological study conducted at department of pediatrics at DRKGMC Hamirpur, Himachal Pradesh, India. Newborn admitted in the SNCU from January 2019 to December 2020.

Selection criteria

All the neonates were admitted in SNCU Hamirpur from January 2019 to December 2020. And babies more than 28 days of age were excluded from study. The sample size was 422.

Detailed procedure

Special newborn care unit (SNCU) run in the department of pediatrics at DRKGMC Hamirpur. Babies less than 28 days with neonatal conditions are admitted in SNCU for treatment and care. SNCU admits babies with neonatal conditions from labor room, operation theatres and the postnatal wards of the same institute as well as babies referred from other private and Government institute of the same and nearby four districts. Those requiring evaluation are investigated and started on the treatment as required. Data of the newborn admitted in the SNCU from January 2019 to December 2020 were retrieved from the indoor case files and those fulfilling the inclusion criteria were included in the study. These newborns were categorized as inborn if delivered in the teaching hospital and outborn if born outside. The data were recorded in the proforma.

Statistical analysis

Data was collected and entered in Microsoft excel work sheet, and was analysed in terms of percentage and numbers. Group analysis was also done wherever required.

RESULTS

A total of 422 newborns were admitted to the SNCU, 225 (53.3%) were males and 197 (46.7%) were females. Among these 381 (90.3%) were inborn and 41 (9.7%) were outborn babies. 316 (74.9%) weighed more than 2.5 kg, 96 (22.7%) were low birth weight (<2.5 kg to 1.5 kg), 6 (1.4%) were very low birth weight (<1.5 kg to 1 kg) and one newborn was extreme low birth weight i.e. <1 kg, two babies (0.7%) weighed more than 4 kg. 356 (84.4%) were full-term Gestation, 43 (10.2%) were late preterm with gestation of 34 weeks to 36 weeks, 16 (3.8%) were 32 weeks to 34 weeks, 3 (0.52%) were of 28 weeks to 32 weeks and 3 (0.7%) were less than 28 weeks gestation and 1 (0.2%) was post-term >42 weeks. Inborn and outborn details are depicted in the (Table 1) and morbidity profile details are depicted in (Table 2).

Table 1: Baseline parameters of newborns admitted in the SNCU.

| Parameters | Inborn | | Out born | | P value |
|--------------------------|--------|------|----------|------|---------|
| | N | % | N | % | |
| Total | 381 | 90.3 | 41 | 9.7 | |
| Sex | | | | | |
| FCH | 174 | 46.6 | 23 | 56.1 | - |
| MCH | 207 | 54.4 | 18 | 43.9 | |
| Birth weight (kg) | | | | | |
| >2.5 | 293 | 76.9 | 23 | 56.1 | - |
| <2.5-1.5 | 83 | 21.8 | 13 | 31.8 | |
| <1.5-1.0 | 2 | 0.52 | 4 | 9.8 | |
| <1 | 1 | 0.26 | 0 | 0 | |
| >4 | 2 | 0.52 | 1 | 2.4 | |
| Gestation (weeks) | | | | | |
| Term 37- 42 | 326 | 85.6 | 30 | 73.1 | 0.148 |
| Late preterm 34-36 | 37 | 9.7 | 6 | 14.6 | |
| 32 -34 | 12 | 3.1 | 4 | 9.8 | |
| 28-32 | 2 | 0.52 | 1 | 2.4 | |
| <28 | 3 | 0.79 | 0 | 0 | |
| >42 | 1 | 0.26 | 0 | 0 | |

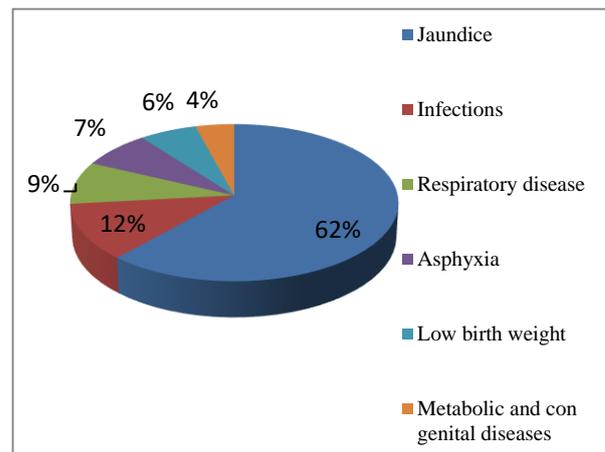


Figure 1: Morbidity profile of newborn admitted in SNCU.

DISCUSSION

One of the active strategies to lower infant mortality is the establishment of SNCUs and qualified staff. This study's objective was to determine the trends in newborn admissions and the variables that contributed to morbidity and mortality in these neonates. Our results revealed a little male preponderance, which is consistent with studies done by Shakya et al and Shreshtha et al.^{8,9} This could be as a result of male newborns' susceptibility and gender regional preference. Numerous studies from India discovered that 90% of newborn admissions to SNCU were inborn. Two of these studies were conducted by Orimadegun and Owa et al and revealed that the proportion of inborn SNCU admissions to outborn admissions ranged from 55.3% to 44.7%.^{10,11}

Table 2: Morbidity profiles of newborns admitted in the SNCU.

| Parameters | Inborn | | Out born | | Total | | P value |
|--|--------|------|----------|------|-------|-----|---------|
| | N | % | N | % | N | % | |
| Jaundice | 240 | 63 | 26 | 63.4 | 266 | 63 | 0.024 |
| Infections | 35 | 9.2 | 5 | 12. | 40 | 9.5 | |
| Respiratory disease | 38 | 9.9 | 0 | 0 | 38 | 9 | |
| Asphyxia | 30 | 7.9 | 3 | 7.3 | 33 | 7.8 | |
| Low birth weight | 22 | 5.8 | 5 | 12.1 | 27 | 6.4 | |
| Metabolic and congenital diseases | 16 | 4.2 | 2 | 4.9 | 18 | 4.3 | |
| Total | 381 | 90.3 | 41 | 9.7 | 422 | 100 | |

In this study, 90% of admissions were identified as inborn. We found that 24% of newborn in this study were born low birth weight, with outborn infants making up over 41% of instances and inborn infants making up 22%. This was disappointing when compared to the NHM's two-year progress report, which showed that low birth weight infants made up around 55% of all SNCU admissions. This might be a result of the general drop in low birth weight across the nation, which has been especially prominent in this area of India.¹²

The factors of the newborns admission were investigated in numerous studies from India and other countries. According to one study, respiratory distress (RDS) (21.9%) as the leading cause followed by sepsis (19%) and perinatal asphyxia (16.37%).¹³ Systemic infection (28.4%), hyperbilirubinemia (27.9%), seizures (11.7%), Hypoglycemia (11.5%), and hypoxic-ischemic encephalopathy (8.3%) were the main reasons for admission in NNPD. Neonatal jaundice, which accounted for (63%) of all SNCU admissions in our research, was followed by infections (9.5%) and respiratory distress (9%). Simiyu et al and Shakya et al both found high occurrences of neonatal jaundice at similar high rates of 35% and 21.97%.^{8,14} On the other hand, our rate of perinatal asphyxia 33 (7.8%) was much lower than others (10%-22%).^{15, 16}

Limitations

The main limitation of this study is that it is a hospital-based study, which means that its findings cannot be extrapolated to the full community.

CONCLUSION

The most sensitive time for morbidity and mortality development is during the newborn period. The main reasons for SNCU hospitalisation include neonatal jaundice, preterm, low birth weight, perinatal asphyxia, and infection. Neonatal Jaundice continues to be the primary reason for both inborn and outborn newborns admission to SNCU, and inborn babies make up the majority of this group.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Sen A, Mahalanabis D, Singh AK, Som TK, Bandyopadhyay S, Mehta P. District Level Sick Newborn Care Unit: a complementary approach to reduction of neonatal mortality. *J Neonatol.* 2004;18:48-55.
2. Sen A, Mahalanabis D, Singh AK, Som TK, Bandyopadhyay S. Development and effects of a neonatal care unit in rural India. *Lancet.* 2005;366:27-8.
3. Sen A, Mahalanabis D, Singh AK, Som TK, Bandyopadhyay S. Role of district level sick newborn care unit in reducing the neonatal mortality rate. *Perinatology.* 2005;7:220-2.
4. Levels and trends in child mortality-report 2013. Available at: <https://data.unicef.org/resources/levels-and-trends-in-child-mortality/>. Accessed on 20 November 2021.
5. Anuradha V, Kumaravel KS, Kumar P, Kumar S. Clinical profile of neonates admitted to a neonatal intensive care unit at a referral hospital in South India. *Int J Pediatr Res.* 2018;5:2-3.
6. 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
7. National family health survey. Available at: <https://ruralindiaonline.org/en/library/resource/national-family-health-survey-nfhs-4-2015-16-india/>. Accessed on 20 November 2021.
8. Shakya A, Shrestha D, Shakya H, Shah SC, Dhakal AK. Clinical profile and outcome of neonates admitted to the Neonatal Care Unit at a teaching hospital in Lalitpur, Nepal. *J Kathmandu Med College.* 2014;3(4):144-8.
9. Shrestha SP, Shah AK, Prajapati R, YR Sharma YR. Profile of neonatal admission at Chitwan medical college. *J Chitwan Med Coll.* 2013;3(6):13-6.
10. Orimadegun AE, Akinbami FO, Tongo OO, Okereke JO. Comparison of neonates born outside and inside hospitals in a children emergency unit, Southwest of Nigeria. *Pediatr Emerg Care.* 2008;24:354-8.

11. Owa JA, Osinaike AI. Neonatal morbidity and mortality in Nigeria. *Indian J Pediatr.* 1998;65:441-9.
12. Khan N, Mozumdar A, Kaur S. Determinants of low birth weight in India: An investigation from the National Family Health Survey. *Am J Hum Biol.* 2019;e23355.
13. Rakholia R, Rawat V, Bano M, Singh G. Neonatal morbidity and mortality of sick newborns admitted in a teaching hospital of Uttarakhand. *Chrismed J Health Res.* 2014;1:228-34.
14. Simiyu DE. Morbidity and mortality of neonates admitted in general paediatric wards at Kenyatta National Hospital. *East Afr Med J.* 2003;80(12):611-6.
15. Begum T, Islam MR. Clinical profile and outcome of 100 neonates in perspectives of neonatal care in a tertiary hospital. *J Shaheed Suhrawardy Med Coll.* 2012;2(1):2-3.
16. Omoigberale AI, Sadoh WE, Nwaneri DU. A 4 year review of neonatal outcome at the University of Benin Teaching Hospital, Benin City. *Niger J Clin Pract.* 2010;13(3):321-5.

Cite this article as: Kumar G, Sood A, Sharma N, Sharma V, Kumar A. Admission Pattern of Newborns admitted in special newborn care unit: an observational from North West of India. *Int J Res Med Sci* 2022;10:2474-7.