

NEONATAL MORBIDITY AND MORTALITY PATTERNS OF BABIES ADMITTED IN SNCU @ ACSR GOVERNMENT MEDICAL COLLEGE, NELLORE, ANDHRA PRADESH

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ABSTRACT

BACKGROUND

According to the National Family Health Survey-3 (NFHS-3) report, the current neonatal mortality rate (NMR) in India of 39 per 1,000 live births, accounts for nearly 77% of all the infant deaths (57/1000) and nearly half of the under-five child deaths (74/1000). One of the millennium development goals (MDG-4) was to reduce child mortality (30/1000 live births) by up to two-thirds. In Telangana and Andhra Pradesh, roughly 25 and 29 infants die for every 1,000 live births. The State target is to bring down NMR rate to less than 10 by 2030. This target can be achieved by setting up Special Newborn Care Units (SNCUs) in every district for better outcome of babies and reduce the mortality rate.

The aim of the study is to assess the demographic profile and morbidity/mortality pattern of neonates admitted to SNCU and study the difference between Inborn and outborn infants.

MATERIALS AND METHODS

Study design- It was a descriptive, retrospective study observed during Jan. 2016 to Dec. 2016 (1 year).

1061 neonates were admitted during the study period. All data were collected from recorded case sheets as inborn or outborn admission, sex, gestational age, weight for gestation, referral centre, age at presentation, indications for admission, duration of hospitalisation, complications encountered, procedures done during hospitalisation and outcome.

RESULTS

Of 1016 admitted babies, Males were 577 (56.79%) and females were 439 (43.20%). Inborn babies were 594 (58.47%) and outborn were 422 (41.53%). Most of the babies admitted in SNCU were preterm 658 (64.82%) of which more babies were inborn than outborn (381 vs. 277). As per birth weight, most of the admitted babies were between 1500-2500 g of which inborn were 44.16% and outborn were 45.02%. The chief morbidity for admission was RDS 313 (30.80%) followed by birth asphyxia 229 (22.53%), Neonatal jaundice 148 (14.56%) and Sepsis 132 (12.99%). The mortality rate in our study was 12.35%. The major causes of mortality are prematurity related RDS 36 (28%) followed by Birth asphyxia 33 (26.4%), sepsis 23 (19.2%) and MAS 22 (17.6%). Deaths due to RDS were more in Inborn 24 (38.70%) than Outborn 12 (19.04%), but deaths due to Birth asphyxia (31.7% vs. 20.96%), MAS (22.22% vs. 12.90%) were more in outborn than inborn babies. Deaths due to sepsis 23 (19.2%), CHD 4 (3.2%) and congenital malformations 5 (4%) were almost similar in both the groups.

CONCLUSION

According to our study, low birth weight and prematurity are the common causes for admission in the NICU. Respiratory distress syndrome, birth asphyxia, neonatal jaundice and meconium-aspiration syndrome are some important and leading causes of morbidity in newborn babies. Commonest causes for mortality were prematurity, respiratory distress syndrome, birth asphyxia and sepsis.

KEYWORDS

Morbidity, Mortality, Neonate, Inborn, Outborn.

HOW TO CITE THIS ARTICLE: Babu MC, Prakash PS, Prasanna CL. Neonatal morbidity and mortality patterns of babies admitted in SNCU @ ACSR Government Medical College, Nellore, Andhra Pradesh. J. Evolution Med. Dent. Sci. 2018;7(02):203-206, DOI: 10.14260/jemds/2018/45

BACKGROUND

According to the National Family Health Survey-3 (NFHS-3) report, the current neonatal mortality rate (NMR) in India of 39 per 1,000 live births, accounts for nearly 77% of all the infant deaths (57/1000) and nearly half of the under-five child deaths (74/1000).

*Financial or Other Competing Interest: None.
Submission 23-11-2017, Peer Review 16-12-2017,
Acceptance 23-12-2017, Published 08-01-2018.*

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DOI: 10.14260/jemds/2018/45



One of the millennium development goals (MDG-4) was to reduce child mortality 30/1000 live births by up to two-thirds.¹ In most developing countries, a higher proportion of neonatal deaths are observed. The rate of the neonatal mortality varies widely among the different states of India, ranging from 11 per 1000 live births in Kerala to 48 per 1000 live births in Uttar Pradesh.¹

In Telangana and Andhra Pradesh, roughly 25 and 29 infants die for every 1,000 live births respectively. The two Telugu-speaking States have the highest Neonatal Mortality Rate (NMR) in South India. In Kerala, the NMR is below 10; in Tamil Nadu, it's between 10 and 15; and in Karnataka the number of deaths is 15 to 20 infants for 1,000 live births.^{2,3}

The state target is to bring down NMR rate to less than 10 by 2030. This target is going to be achieved by setting up three Special Newborn Care Units (SNCUs) in each district

and the State is the first in South India to implement an online monitoring system for all SNCUs. This has resulted in showing improvement on the NMR front as against during undivided Andhra Pradesh.⁴

MATERIALS AND METHODS

This study is a retrospective, descriptive study of medical records carried out in the neonatal intensive care unit (SNCU) of the Department of Paediatrics, ACSR, GMC, Nellore for one year Jan. 2016 to Dec. 2016.

Inclusion Criteria

All neonates <28 days admitted to SNCU during the study period were included in the study.

Exclusion Criteria

Babies >28 days of life, babies brought dead to SNCU and Orphan babies admitted for observational care.

After obtaining permission of head of the institute, data of all the admitted babies were recorded by analysing all the case sheets from the records section. Data was collected as inborn or outborn, admission, sex, gestational age, weight for gestation, referral centre, age at presentation, indications for admission, duration of hospitalisation, complications encountered, procedures done during hospitalisation and outcome.

Primary disease was considered as final diagnosis even if the baby developed complications of primary disease or having more than one disease.

WHO definitions were used for Term, Preterm, Low Birth Weight (LBW), Very Low Birth Weight (VLBW), Extreme Low Birth Weight (ELBW) and congenital malformation. Meconium aspiration syndrome was neonates diagnosed on basis of history, clinical and radiological findings. Birth Asphyxia was diagnosed APGAR <7 @ 5 min. Neonatal jaundice was diagnosed after assessment of serum bilirubin and in pathological zone as per AAP charts. Sepsis was diagnosed by clinical and appropriate lab screening tests.

RESULTS

During the study period, 1016 neonates were admitted in SNCU.

Baseline characteristics of neonates:

Of 1016 admitted babies, Males were 577 (56.79%) and females were 439 (43.20%). Inborn babies were 594 (58.47%) and outborn were 422 (41.53%).

Age and Gestation of the Neonates

Most of the babies admitted in SNCU were preterm 658 (64.82%) of which more babies are inborn than outborn (381 vs. 277). As per birth weight >2500 g, 1500-2499, and less than 1500, most of the admitted babies were between 1500-2500 g i.e. 455 of which inborns were 44.16% and outborns were 45.02%. In category of <1500 g, outborns were more than inborn babies i.e. 157 (37.20%) vs. 103 (17.34%).

Admission	Number	Percentage
Inborn	594	58.47%
Outborn	422	41.53%
Total	1016	100%

Tables 1. Mode of Admission

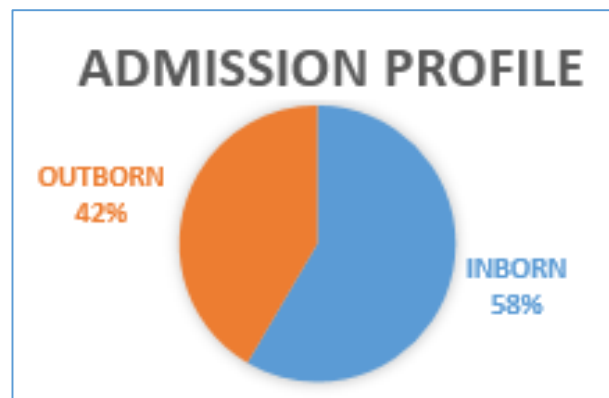


Figure 1

Gender	Inborn	Outborn	Total
Males	577	56.79%	
Females	439	43.20%	
Total	1016	100%	
Distribution of as per birth weight			
>2500	226 (38.04%)	75 (17.77%)	301 (29.62%)
1500-2499	265 (44.16%)	190 (45.02%)	45 (44.78%)
<1500	103 (17.34%)	157 (37.20%)	260 (25.6%)
Gestation age at the time of delivery			
Term	213 (31.85%)	145 (34%)	358 (35.27%)
Preterm	381 (64.14%)	277 (63.09%)	658 (64.82%)

Table 2.

Morbidity Profile of Admitted Neonates

The chief morbidity for admission was RDS 313 (30.80%) followed by birth asphyxia 229 (22.53%), Neonatal jaundice 148 (14.56%) and then sepsis 132 (12.99%). A lesser percentage of babies were having MAS 73 (7.18%), Hypoglycaemia 32 (3.14%), Congenital anomalies 28 (2.75%), seizures 23 (2.26%), surgical causes 18 (1.7%) and then CHD 14 (1.37%).

Respiratory distress syndrome was the major morbidity found in both inborn and outborn babies i.e. 206 (34.68%) vs. 107 (25.35%) and the incidence was more in inborn. Birth Asphyxia and sepsis were more in outborn babies than inborn babies (27.96 vs. 22.53 and 16.93% vs. 10.63%), Neonatal jaundice was slightly more in inborn than outborn [96 (16.16%) vs. 52 (12.32%)]. Rest of the morbidities, hypoglycaemia (2.60% vs. 3.4%), seizures (2.02% vs. 2.60%), CHD (1.01% vs. 1.8%) and surgical (1.34% vs. 2.3%) causes were similar in both inborn and outborn babies.

Morbidity	Inborn	Outborn	Total
RDS	206 (34.68%)	107 (25.35%)	313 (30.80%)
MAS	49 (8.24%)	24 (5.68%)	73 (7.18%)
HIE	111 (18.68%)	118 (27.96%)	229 (22.53%)
Sepsis	63 (10.63%)	69 (16.39%)	132 (12.99%)
Jaundice	96 (16.16%)	52 (12.32%)	148 (14.56%)
Seizures	12 (2.02%)	11 (2.60%)	23 (2.26%)
Congenital malformations	10 (1.68%)	18 (4.2%)	28 (2.75%)
Congenital Heart Disease	6 (1.01%)	8 (1.8%)	14 (1.37%)
Hypoglycaemia	21 (3.53%)	11 (2.60%)	32 (3.14%)
Surgical	8 (1.34%)	10 (2.3%)	18 (1.7%)

Table 3. Morbidity Profile of Neonates

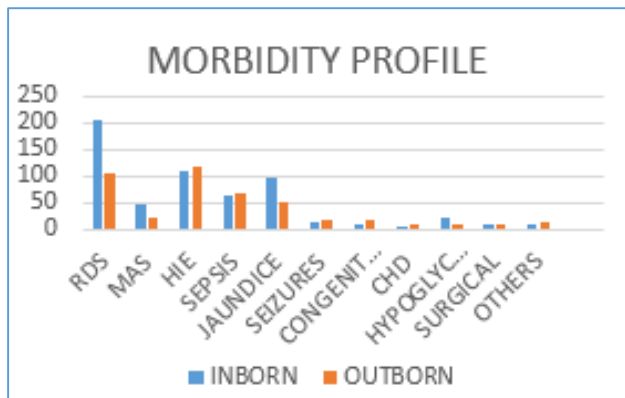


Figure 2

Mortality Profile of Admitted Neonates

Out of 1016 babies admitted in SNCU, 636 (62.59%) were discharged, 45 (4.4%) were referred to higher centre for advanced medical care, 210 (20.66%) left against medical advice.

The total neonatal mortality rate is 12.3% (125). The mortality rate was higher in outborn (14.92% vs. 10.43%). As per birth weight, the mortality was higher in 1500-2500 g weight at 44 (35.25%) and more in outborn at 27 (42.85%) cases compared to inborn 17 (27.41%). The major causes of mortality are RDS 36 (28%) followed by birth asphyxia 33 (26.4%), sepsis 23 (19.2%) and MAS 22 (17.6%). Deaths due to RDS was more in Inborn 24 (38.70%) than Outborn 12 (19.04%). But deaths due to Birth asphyxia (31.7% vs. 20.9%), MAS (22.22% vs. 12.90) were more in outborn than inborn babies. Deaths due to sepsis 23 (19.2%), CHD 4 (3.2%) and congenital malformations 5 (4%) were almost similar in both the groups.

	Inborn	Outborn	Total
Discharge	395 (66.49%)	241 (57.00%)	636 (62.59%)
Referral	25 (14.20%)	20 (4.73%)	44 (4.4%)
LAMA	112 (18.85%)	98 (23.22%)	210 (20.66%)
Death	62 (10.43%)	63 (14.92%)	125 (12.30%)
TOTAL	594	422	1016

Table 4. Outcomes

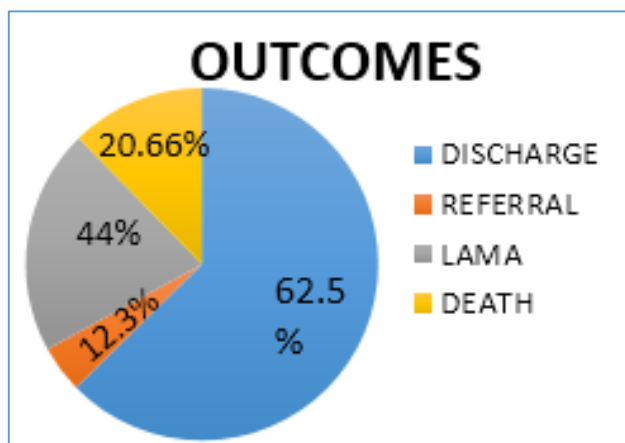


Figure 3

Morbidity	Inborn	Outborn	TOTAL
RDS	24 (38.70%)	12 (19.04%)	36 (28.00%)
Mas	8 (12.90%)	14 (22.22%)	22 (17.60%)
HIE	13 (20.96%)	20 (31.70%)	33 (26.4%)
Sepsis	11 (17.74%)	13 (20.63%)	24 (19.4%)
Congenital malformations	3 (4.8%)	2 (3.17%)	5 (4%)
Congenital heart disease	2 (3.22%)	2 (3.17%)	4 (3.2%)
Others	1 (1.6%)	0	1 (0.8%)
Total	62	63	125

Table 5. Causes of Neonatal Deaths

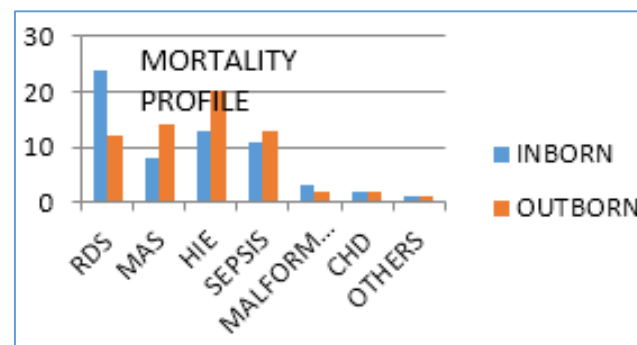


Figure 4

DISCUSSION

The pattern of babies admitted in SNCU (male/female and Preterm/term) is in concordance with National Neonatal Perinatal Database (NNPD) and other studies of rural India.⁴ The study shows a high male to female ratio and more preterm than term babies. Similar findings were reported from study conducted by Veena Prasad and Nutan Singh in Uttarakhand.⁵

In our study, preterm babies 64.82% and LBW babies 70.06% are important contributors of SNCU admission. Similar findings were noted in other studies where the incidence of low birth weight ranges from 41.2% to 53%.¹³ Our study results on low birth rate and premature admission is consistent with the results of study conducted by Garg P et al in New Delhi.⁶

The chief morbidity for admission was RDS 313 (30.80%) followed by birth asphyxia 229(22.53%), Neonatal jaundice 148 (14.56%) and then sepsis 132 (12.99%). The findings are similar to NNPD RDS (28.4%), but HIE is more than NNPD (8.3%). Hyperbilirubinaemia in our studies is less compared to NNPD 14.56% vs. 27.9%. A study conducted by Gauchan E in Nepal highlighted that jaundice, sepsis and perinatal asphyxia as being the commonest indication for admission in the neonatal intensive care unit.⁷

These results were similar to NNPD data where prematurity related condition was 26.5%, sepsis was 36%, but perinatal hypoxia was less (10%). Our study is similar to studies done in Nepal,¹³ Pakistan¹⁸ and South Africa.¹⁹⁻¹⁰ The rate of mortality was lower than the rates reported in the study conducted by Veena Prasad et al⁴ in Uttarakhand.

CONCLUSION

According to our study, low birth weight and prematurity are the common causes for admission in the NICU. Respiratory distress syndrome, birth asphyxia, neonatal jaundice and meconium aspiration syndrome are some important and leading causes of morbidity in newborn babies. Commonest causes for mortality were prematurity, respiratory distress syndrome, birth asphyxia and sepsis. Most of the morbidities and subsequently the mortalities can be prevented by improving and effective implementation of important preventive services like maternal care and IMNCI, timely interventions and timely referral to tertiary care centres for delivery of high risk pregnancies and care of neonates in high risk situation. Need of the hour is to make people aware of the existing SNCU neonatal facilities with modern gadgets and equipment. The SNCUs should be strengthened with more CPAPs and availability of surfactants to prevent prematurity related RDS deaths.

Limitations of Study

- i. This is a hospital-based study and does not represent community data.
- ii. We were unable to diagnose inborn errors of metabolism due to lack of diagnostic facilities.

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