

Pattern of Admission and Outcome of Neonates in a NICU of Tribal Region Bastar, India

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ABSTRACT

Objective: To know the pattern of admission and outcome of neonates in NICU.

Material & Methods: The study is a retrospective review of cases managed in the neonatal unit of the Late BRKM Govt. Medical College cum Maharani Hospital Jagdalpur, Chhattisgarh, India. Data extracted included: The age of neonate on admission, sex, weight on admission or at birth, inside and outside delivered babies, final diagnosis, and outcomes and cause of death.

Results: During the period of study, a total of 1502 neonates were admitted in the NICU. Of the 1502, 67.77% were inborn and 32.24% were outside delivered babies. The weight wise distribution of all the admissions were ELBW 3.4%, VLBW 18.06%, LBW 42.74% and remaining babies had normal birth weight. Half of the babies admitted in our NICU were preterm (51.99%), followed by hypoxic ischemic encephalopathy 23.30%, neonatal septicemia 12.98%, neonatal jaundice 6.12%. Out of 1502 admitted neonates in the NICU, 55.59% babies were discharged successfully, 15.54% were given discharged on request and 21.50% died. In our study commonest associated cause of neonatal mortality was prematurity 54.98%, while other causes of death were HIE 32.19%, neonatal sepsis 9.90%. The mortality percent in outside delivered babies was just double 32.8% then inside delivered babies 16.1%.

Conclusion: In our study, prematurity, HIE and sepsis are the common causes for admission and mortality in newborn babies of our NICU. Most of the morbidities and subsequent mortalities can be prevented by improving the basic nursing care and effective implementation of preventive services like maternal care, IMNCI, timely interventions and timely referral to tertiary care centers.

Key Words: NICU, Prematurity, LBW, Neonatal admission, Neonatal death.

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INTRODUCTION

Newborn infants are unique in their physiology and health problems that they experience. Neonatal period is characterized by transition to extra uterine life and rapid growth and development. Newborn health is the key to child health and survival. About 0.76 million neonates die every year in India, the highest for any country in the world. The neonatal mortality rate (NMR) of the country did decline from 52 per 1000 live births in 1990 to 29 per 1000 live births in 2012 (SRS 2012) but the rate of decline has been slow, and lags behind that of infant and under-five child mortality rates. The slower decline has led to increasing contribution of neonatal mortality to infant mortality. With the current infant and under-five child mortality rates of 42 and 52 per 1000 live births respectively (SRS 2012), about 70% of infant deaths and more than half of under-five child deaths occur in the neonatal period, the first 4 weeks of life. The three major causes

of neonatal deaths are preterm birth complications, infections, and intrapartum related complications; together, they contribute to nearly 90% of total neonatal deaths. While almost all of intrapartum-related deaths and majority of prematurity-related deaths occur in the first week of life, more than half of infection related deaths occur after the first week of life. This has implications for the home/community-based postnatal care of neonates¹.

MATERIALS AND METHODS

The study was a review of cases managed in the neonatal unit of the Late BRKM Govt. Medical College cum Maharani Hospital Jagdalpur, Chhattisgarh, India. Babies admitted in our unit are from within the hospital and also receives referral from various govt. and private hospitals of entire Bastar division and some

areas of Orissa state. Facilities available in our NICU include 20 radiant warmers, 8 Phototherapy units, 4 syringe pumps and 3 multipara monitors. In the postnatal ward, babies who were ill but do not require intensive or special care are admitted with their mothers and managed there only.

It was a retrospective descriptive study of records of neonates admitted into the neonatal unit between 1 August 2014 and 30 July 2015 over a period of one year. Data on all neonates admitted into the neonatal unit were collected from the admission, discharge, and death registers. Data extracted included: The age of neonate on admission, sex, weight on admission or at birth, inside and outside delivered babies, main final diagnosis, and outcomes (discharge, death or left against medical advice) and cause of death. Approval for the study was obtained from the hospital and ethical committee.

Table 1: Sex wise distribution of admission

Sex	Admission	Percentage
Male	787	52.39
Female	715	47.71
Total	1502	

Table 2: Admission ratio of Inside and outside delivered babies

	Admission	Percentage
Inside delivered	1018	67.77%
Outside delivered	484	32.24%

Table 3: Weight wise distribution of admission

Weight category	Admission (1502)	Percentage
ELBW	52	3.4%
VLBW	271	18.04%
LBW	642	42.74%
>2.5 kg	537	35.75%

Table 4: Term wise distribution of admission

	Admission (1502)	Percentage
Preterm	781	51.99%
Fullterm	721	48.09%

Table 5: Cause wise admission in NICU

Cause	Admission	Percentage
Preterm	781	51.99%
HIE	350	23.30%
Neonatal sepsis	195	12.98%
Neonatal jaundice	92	6.125%
Neonatal seizure	45	2.99%
MAS	20	1.34%
Other (CHD, Cong. Malformation, aspiration)	19	1.26%

Table 6: Various outcomes of NICU

Outcome	Admission (1502)	Percent
Discharge	835	55.59%
DOR	233	15.54%
Death	323	21.50%
LAMA	68	4.52%
Abscond	30	1.99%
Refer	13	0.86%

Table 7: Weight wise distribution of admission and death

	Admission	Death	Percentage
ELBW	52	34	65.38%
VLBW	271	103	38.00%
LBW	642	112	17.44%
>2.5 kg	537	74	13.78%
	1502	323	

Table 8: Distribution of cause of death

	Death	Percentage
Preterm	176	54.48%
HIE	104	32.19%
Neonatal sepsis	32	9.90%
Congenital anomalies	5	1.54%
MAS+ HIE	3	0.92%
Neonatal jaundice	2	0.61%
Other	1	0.31%

Table 9: Death ratio among the inside and outside delivered babies

	Death (323)	Percentage
Inside delivered	164	54.12%
Outside delivered	159	52.47%

Table 10: Percentage of death in inside and outside delivered babies

	Admission	Death	Percent
Inside delivered	1018	164	16.1%
Outside delivered	484	159	32.8%

RESULTS

During the period of study, there were a total of 1502 neonates admitted to the NICU. Among them 52.3% were male and 47.7% female. Of the 1502, 67.7% were inborn and 32.3% were outside delivered babies. the weight wise distribution of all the admissions were ELBW 3.4% (n=52), VLBW 18.06% (n=271), LBW 42.74%(n=642)and remaining babies had normal birth weight. Half of the babies admitted in our NICU were preterm (51.99%), followed by hypoxic ischemic encephalopathy 23.30%, neonatal septicemia 12.98%, neonatal jaundice 6.12 %, neonatal seizure

2.99%, MAS 1.34% and others(CHD ,congenital anomalies & aspiration) 1.26%. Antibiotics and oxygen were the common interventions used for the management, while anticonvulsive therapy was required in 210 patients; phototherapy was used only for 92 babies. Most of the time multiple therapies were used to manage life threatening and morbid conditions.

Of the 1502 neonates admitted in our NICU 55.59% babies were discharged successfully, 15.54% were discharged on request and 323(21.50%) were died. When we see the weight wise correlation of admission and death it was 65.38% in ELBW, 38% in VLBW, 17.44% in LBW and 13.78% in normal weight babies. In our study commonest associated cause of neonatal mortality was prematurity 54.98%, while other causes of death were HIE 32.19%, neonatal sepsis 9.90%,congenital anomalies 1.54%, MAS + HIE 0.92% neonatal jaundice 0.61% and others are responsible for 0.31% of neonatal deaths. The mortality percent in outside delivered babies was just double 32.8% then inborn delivered babies 16.1%.

DISCUSSION

Our study shows that total 1502 newborn babies were admitted in Maharani Hospital Jagdalpur from 1st of August 2014 to 30th July 2015 over a period of one year. Among them 52.3% male and 47.7% were female with a male to female ratio of 1.1:1. The male predominance in this study is consistent with other studies². This indicates that male neonates are more vulnerable during the neonatal period, a finding in agreement with the well described biological survival of girls in the neonatal period. In our study 67% were inborn and rest 32% were outborn babies, who were referred from different private hospitals in the city and Peripheral government hospitals of Bastar, Bijapur, Sukma and Kondagoan districts. Similar findings are reported from study conducted by Patil Ravindra B, K. Raghavendraswamy³.

Percentage of ELBW was 3.4%, VLBW 18.06%, LBW 42.74% and remaining babies had normal birth weight. Findings are very similar from the study conducted by Veena Prasad and Nutan Singh⁴.

About half (51.9%) of the babies admitted in our hospital were preterm and it was the leading cause of admission in our NICU. This data is similar to only one study conducted by Ike Elizabeth U and Modupe O. Oyetunde⁵ at Ibadan Nigeria (54%) and rest of the studies the contribution of preterm admission is comparatively less like MS HOQUE, S ALAM (28%)⁶, Raghvendra Narayan (13%)², Veena Prasad and Nutan Singh⁴ (20%). The probable explanation for the high contribution of preterm admission is early marriage and poor nutritional status of the mother.

In our study birth asphyxia was the second most common cause of NICU admission accounting for 23.3%. This is similar to the study conducted by Bose O. Toma, Olukemi O(18%) et al⁷ and Ike Elizabeth U, Modupe O.Oyetunde⁵ (19%) and Shah GS, Yadav S et al⁹ (20.2%). There are some studies having high and some are low incidence of birth asphyxia when it compare with our observation. MS HOQUE, S ALAM et al⁶ (37.7%) and Jan AZ, Ahmad S, Zahid SB (9.1%).

In our study Neonatal sepsis contributes 12.9% of total admission. This is about the same experience in Uttarakhand⁴ where neonatal sepsis accounting for 10% of total admission. Neonatal jaundice was responsible for 6.12% of total admission while the reports of other studies are 36% in Peshawar Pakistan by Jan AZ, Ahmad

S⁸, 11% in Nigeria by Bose O. Toma, Olukemi O et al⁷. Contribution of admission by neonatal seizure and MAS is 2.99% and 1.34% respectively. Findings were similar with the study done at Sultan Pakistan¹⁰.

Of the 1502 neonates admitted in our NICU 55.59% babies were discharged successfully, 15.54% were discharged on request and 21.50% were died. Mortality rate is lower than the studies conducted at Pakistan¹¹ and Bangladesh⁶ but it is slightly higher when we compare the results of studies conducted in other parts of India^{3,4}. Weight wise correlation of admission and death it was 65.38% in ELBW, 38% in VLBW, 17.44% in LBW and 13.78% in normal weight babies, weight wise mortality is good in comparison to studies conducted in Bangladesh and some parts of India^{6,3,4}.

In our study commonest associated cause of neonatal mortality was prematurity 54.98%, while other causes of death were HIE 32.19%, neonatal sepsis 9.90%,congenital anomalies 1.54%, MAS + HIE 0.92% and neonatal jaundice was responsible for 0.61% of neonatal deaths. Prematurity was the leading cause of neonatal deaths in the study conducted in other developing countries including India^{2,3,4,7,10}. In our study HIE is accounting for 32.19% of neonatal death which is slightly higher than the studies conducted in Shivamogga, Karnatka (8.5%) and Haldwani Uttarkhand (13.8%), India^{3,4}.

The mortality percent in outside delivered babies is more than the inside delivered babies which is similar to the study conducted at Shivamogga, Karnataka, India³.

CONCLUSION

According to our study, prematurity, HIE and sepsis are the common causes for admission and mortality in newborn babies of our NICU. 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. We strongly recommend to increase in manpower to decrease in neonatal mortality rate by providing better nursing care in the tribal region like Bastar.

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ETHICAL CONSIDERATIONS

Approval was taken from Institutional Ethics Committee.

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