Disease Profile and Hospital Outcome of Newborn Admitted to Neonatal Intermediate Care Unit at Tertiary Care Center in Nepal

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ABSTRACT

Background

Neonatal mortality rate (NMR) is decreasing in Nepal but at a slower pace than infant and child mortality. In order to improve neonatal outcome, Care of sick children can be done better so as to aid in reducing neonatal mortality rate.

Objective

The objective was to identify pattern of diseases and outcome admitted to Neonatal Intermediate care Unit (NIMCU).

Method

A retrospective study was conducted at Neonatal Intermediate care Unit of Kanti Children's hospital from Bhadra 2071 to Shravan 2073 (August 2014 to July 2016).

Result

Total 1286 neonates were admitted in Neonatal Intermediate care Unit with the highest admission in the months of Bhadra (August-September) 12.52% and the lowest in Push (December-January) 4.82%. Among the admitted cases, 1,028 (80.0%) were full term while 256 (20.0%) were preterm. Among the total admission, 43.6% were less than 7 days old which is the most vulnerable period during the newborn phase. Admission due to neonatal sepsis was 892 (69.36%). Among them, 628 (70.40%) were late onset neonatal sepsis while 264 (29.60%) were early onset. Neonatal jaundice accounted for 12.36% (159) of the cases while Hypoxic Ischemic Encephalopathy accounted for 4.80% (62) of cases. Congenital Heart Disease were 53 (4.12%) and neonatal pustulosis were 27 (2.20%). Meningitis accounted for 45 (3.49%) of cases and UTI 29 (2.22). Death during treatment were 18 (1.39%). 7% of cases deteriorated and referred to NICU while, 3.2 % of cases were referred to other centers and 5.1% of cases were either discharged on request or left against medical advice.

Conclusion

Neonatal sepsis including both early and late onset, Congenital Heart disease, birth asphyxia and neonatal Jaundice accounted for majority of admission in NICU. Three of four these etiologies are preventable up to some extent.

KEY WORDS

Morbidity, mortality neonate, sepsis, outcome

INTRODUCTION

The neonatal period is a very vulnerable period of life due to many factors, which in most of the cases is preventable.[1,2] Sustainable Developmental goal (SDG) targeted to reduce neonatal mortality to at least as low as 12 per 1,000 live births by 2030.[3] But the neonatal mortality rate of our country is 23 per 1,000 live birth and the morbidity and mortality is mainly due to severe infection, hypothermia, Low birth weight and asphyxia in community.[4] The pattern of neonatal disease changes from time to time even at the same place.[5] Neonatal sepsis is the leading cause of hospital admission (34.5%) followed by prematurity (23.1%) and asphyxia (23.3%) in Nepal.[6] The neonatal disease pattern is a sensitive indicator of availability, utilization and effectiveness of mother and child health services in the community. It is helpful to generate data about patterns of diseases in neonates admitted in government hospital and outcome of their treatment. The data could help in shaping up policies with ultimate effect in achieving SDG by 2030.

METHODS

TThis was a retrospective study conducted at the 20 beded Neonatal Intermediate Care Unit (NIMCU), Kanti Children's Hospital, Nepal. Retrospective data from Bhadra 2071 to shravan 2073 (August 2014 to July 2016) were obtained from medical record section of hospital after Ethical clearance from the institutional ethical committee of the hospital. A total of 1286 out born neonates admitted in NIMCU during this period were included in the study. NIMCU has facilities of, central oxygen line, warmers, phototherapy, Bubble CPAP and multichannel patient monitor etc. Data on age at admission, gender, gestational age, birth weight, initial presenting symptoms at admission, final diagnosis and outcome in regards to whether the newborn was discharged after completion of treatment, discharged on request, left against medical advice, referred to intensive care unit or expired were collected. Diagnosis was mainly clinical with specific laboratory or radiological findings. Sepsis was diagnosed on clinical criteria used by WHO in Intergrated management of neonate and childhood illness (IMNCI) along with C-reactive protein (CRP), complete blood count (CBC), positive blood culture. Meningitis was diagnosed by cerebrospinal fluid (CSF) examination along with other clinical parameters used in sepsis. Congenital heart disease was confirmed by Echocardiography.

Neonatal sepsis was classified as suspected and culture proven sepsis on the basis of clinical profile, septic screen and blood culture.[7,8] Diagnosis of perinatal asphyxia was based on the criteria set by the National Neonatology Forum of India and World Health Organization.[9] APGAR score at one minute of 0 to 3 and 4 to 7 signifies severe and moderate birth asphyxia respectively. Hypoxic ischemic encephalopathy was classified on the basis of Sarnat and Sarnat staging.[10] Data was entered and analyzed using SPSS 20.0.

RESULTS

During the period of study, total of 1286 neonates were admitted in NIMCU. 861(67%) of the neonates were male and 423 (33%) were female. Male to female ratio was 2:1. Majority of the babies (n=1028; 80.0%) were full-term, 256 (20.0%) were preterm. Among the total admission, 1157 (90.0%) were from outside the valley and 561 (43.6%) were less than 7 days old which is the most vulnerable period during the newborn phase.

Table 1. Cause of admission in Neonatal Intermediate Care Unit

	Bhadra 2072 - Shravan 2073		Bhadra2071 - Shravan 2072	
	n	%	n	%
Early onset neonatal sepsis	106	16.51	158	24.53
Late onset neonatal sepsis	263	40.96	319	49.53
Neonatal jaundice	96	14.95	63	9.78
Hypoxic ischaemic Encephalopathy	29	4.5	33	5.12
Cong Heart Disease	28	4.36	16	2.48
Meconium aspiration syndrome	11	1.71	16	2.48
Neonatal Pustulosis	30	4.67	16	2.48
Necrotizing enterocolits	3	0.46	6	0.93
Others	76	11.83	17	2.63
Total	642		644	

The commonest diagnosis for admission was neonatal sepsis (n=846; 65.77%) followed by Neonatal Jaundice (n=159; 12.46%) and perinatal asphyxia (n=62; 4.82%) (Table 1). Among sepsis cases, Meningitis accounted for 45 (3.49%) and UTI 29(2.22%).

Among the total admission of 1286, the highest admission in Bhadra (August-September) (n=161;12.52%) and the lowest in Push (December-January) (n=62;4.82%). (Table 2)

Among the admitted cases, 1115 (86.70%) were improved and death during treatment were 18 (1.39%). Likewise 89 (6.92%) of cases deteriorated and referred to NICU with in hospital or NICU of other hospital while, 64(4.97%) of cases were either discharged on request or left against medical advice. (Table 3)

Table 2. Month wise admission Pattern in Neonatal Intermediate Care Unit

Year	Bhadra	Ashwin	Kartik	Mangsir	Poush	Magh	Falgun	Chaitra	Baisakh	Jestha	Ashad	Shrawan	Total
2071/2072	77	73	50	47	34	39	45	48	41	54	64	72	644
2072/2073	84	65	76	37	28	23	37	54	49	64	62	63	642
Total	161	138	126	84	62	62	82	102	90	118	126	135	1286

Table 3. Outcome of the neonate admitted in NIMCU

Outcome /Time	Bhadra 2071-Shravan 2072		Bhadra 2072-Shravan 2071	
	n	%	n	%
Improved	559	86.8	556	86.44
Transfer to other center or DOR	32	4.96	32	4.98
Mortality	8	1.24	10	1.55
NICU transfer	45	6.98	44	6.85
	644		642	

DISCUSSION

Total 1286 newborns were admitted in MINCU during study period. Males were predominant in our study, which was similar to other studies conducted in neonatal intensive care units.[11-13] Males get more attention on part of caregivers and are brought to the hospital for seeking health services. The highest admission in Bhadra (August-September) (n=161;12.52%) and the lowest in Push (December-January) (n=62;4.82%). This seems same trend for both the year. Similar result were observed on other study by Lee et al.[14] This might be due to the more birth during that season and this gives the importance of temporal relation of incidence of admission and help for the management plan of the hospital. Review article by Lee et al. explained as the chance of more birth at that period as well as there is linkage of premature birth and low birth weight birth during this season.[14]

Our study showed sepsis (early and late) was the commonest cause of admission in our NIMCU. Sepsis accounted for about one-third cases requiring admission in our NIMCU. This correlates with the national data of commonest cause of neonatal morbidity and mortality is possible severe bacterial infection.[4] Some other study also reported a high incidence (41.3%) of neonatal sepsis.[6,11] However, lower incidences (6.4-10.5%) were reported by other authors in their studies.[12] preventive measures adopted during antenatal, intrapartum and postnatal period is crucial to reduce the incidence of neonatal sepsis though we did not look after in our study. Among sepsis cases, Meningitis accounted for 45(3.49%) and UTI 29(2.22%). This is quite significant and has chance of having sequel if not treated adequately and effectively.

Neonatal jaundice (12.46%) is the second common cause for NIMCU admission. Much higher incidences (36.2-54%) have been reported in other studies done in both NIMCU and NICU setting.[15-17] On the other hand study of another center with NICU of Nepal shows the the lower incidence (5.90%).[6] Cases of neonatal hyperbilirubinemia were mainly admitted for phototherapy.

Hypoxic Ischemic Encephalopathy (4.82%) was the third common cause of admission in our NIMCU. This is similar to the south African study but lower than the other NICU center of Nepal and neighbouring country.[6,14,15] This may be due to the fact that most of the severe form of Hypoxic Ischemic Encephalopathy goes to the NICU rather than NIMCU as they has chance of having more complication. Occurrence of birth asphyxia indicates that, the level of neonatal care existing in our health sector especially in the community is not appropriate. So adequate attention is to be paid in training of health workers which can effectively reduce the incidence as well as its severity and decrease the load of NIMCU admissions at tertiary care level and it also decrease the load to the NICU.

Thus Neonatal sepsis, neonatal Jaundice and Hypoxic Ischemic Encephalopathy are the three commonest cause of the NIMCU admission in our hospital. Similar result was found in the other NICU set up of other parts of the Nepal too.[6,18] But it is some different from the community study where several bacterial infection, hypothermia, low birth weight and hypoxia are the common cause of morbidity and mortality.[4] This may be due to the only sick neonate came to seek the service of the hospital. Most of the mothers and caregivers might be worried with Neonatal jaundice and might have brought to the hospital for phototherapy. And the hypothermia might have been managed well in community as well as initial days of hospital admission.

Most of the admitted cases (86.80%, 86.44%) in both year were improved and the death in NIMCU is less than 2% which shows the good NIMCU care. Those cases which detoriated during treatment was transfer to NICU and the outcome of such neonate was not accounted in this study. The other study of Nepal conducted in NICU set up is high (4.6%).[6] Around 7 out of 100 neonate was transfer to NICU. The transfer to other center or leave against medical advice was around 5%, this shows the necessity of NICU extension in our hospital.

This is a single hospital base study and may not reflect the exact scenario of the community and nation as a whole. This is only NIMCU based study and have some limitation as same neonate transferred to NICU from NIMCU was not followed.

CONCLUSION

Neonatal sepsis including both early and late onset, neonatal Jaundice, Hypoxic Ischemic Encephalopathy and Congenital Heart disease accounted for majority of admission in NICU. Three of four these etiologies are preventable up to some extent and, if detected earlier, can be effectively treated in order to reduce morbidity and mortality. This study was done to know the disease pattern among newborn which is important for good neonatal care and development of preventive strategies. The hospital outcome of admitted neonate was good with few NICU transfer and it showed the necessity of NICU expansion.

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