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Mortality and morbidity profile of neonates admitted to Special neonatal care unit

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Abstract
Introduction: *The neonatal period (0 to 28 days of life) has been the most critical period of life because of the various problems associated with it. Quite a few studies in India have described in detail the morbidity profile of tertiary care NICUs.*
Materials and Method: *It was an observational study done at Regional hospital Bilaspur, all neonates admitted in SNCU between 2015 to 2019 were included in the study.*
Result: *A total of 1833 neonates were admitted during the study period, Neonatal jaundice was found to be the most common cause of admission 834 (45.4%), Other prominent causes were sepsis 242 (13.2%), birth asphyxia 125 (6.8%), meconium aspiration syndrome 103 (5.6%).*
Conclusion: *Our study shows that neonatal jaundice birth asphyxia and sepsis are the commonest causes of admission.*
Keywords: *Special neonatal care unit, mortality and morbidity profile.*

Introduction

Evidence from relevant literature has shown enormous global progress in the care of newborns during the past 2-3 decades especially in the resource rich settings[1,2]. This progress is reflected in the considerable improvement in the survival rate of newborn babies and a better prognosis among survivals in the technically advanced nations[1,2]. The reverse is the case in most developing countries where neonatal morbidity such as NNS, LBW, SBA, NNJ, prematurity still remain a major medical problem[3-7]. The survival of very preterm in such environments is a major concern for paediatricians caring for the newborns. The neonatal period (0 to 28 days of life) has been the most critical period of life because of the various problems associated with it[7]. A large majority of newborns may not experience serious problems/difficulties and may require only minimal care by their mothers with little supervision of health workers.

Quite a few studies in India have described in detail the morbidity profile of tertiary care NICUs. However, there are few clinical studies to show the morbidity and mortality profile of SNCUs. The neonatal morbidity profile also had a paradigm shift over the past two decades, as the primary cause of neonatal mortality is now prematurity and associated complications, unlikely birth asphyxia and neonatal sepsis, which

constituted the major chunk of neonatal mortality few decades before. Hence, it is high time, a clinical study should be performed in a secondary care NICU to reveal the true picture of neonatal morbidity and mortality in community by avoiding referral bias, which is a major shortcoming of clinical studies from tertiary care units.

Materials and Method

It was an observational study done at Regional hospital Bilaspur catering rural area population of Bilaspur, surrounding areas of Mandi, Hamirpur and Solan districts.

This government hospital provides maternity services in the city, in addition to high percentage of referral of high-risk pregnancies and sick newborns from other peripheral hospitals. The medical files of the neonates were retrospectively reviewed.

All neonates admitted in SNCU between 2015 to 2019 were included in the study. Neonates taken against medical advice and those referred to tertiary care centers were excluded from the analysis. Neonatal infections were diagnosed clinically aided with appropriate tests, which include sepsis screen, blood culture, chest radiograph, and cerebrospinal fluid analysis. Ethical clearance from pediatric department of concerned hospital.

Result

A total of 1833 neonates were admitted during the study period (Table no. 1). Total male babies were 1072 (58%) and female babies were 762 (41.5%). Out of total 1380 (75.2%) were in bourn and 453 (24.7%) were out born. 580 (31.6%) new bourns were pre term and 1256 (68.5%) were term babies. Significantly higher number of inborn babies were admitted compared to out born babies.

Neonatal jaundice was found to be the most common cause of admission 834 (45.4%), Other prominent causes were sepsis 242 (13.2%), birth asphyxia 125 (6.8%), meconium aspiration syndrome 103 (5.6%) (Table no 2).

Most common reason for neonatal death was Sepsis/Pneumonia /Meningitis, 11 (0.6%), other most common causes for neonatal death was prematurity 8 (0.4%), HIE/Moderate-severe birth Asphyxia and others 7 (0.38%) (Table no. 3).

Table no. 1: Admissions in special neonatal care unit

		2015	2016	2017	2018	2019 (till may)
Admission in the unit		196	394	460	608	175
Male		117	235	271	354	95
Female		79	159	180	254	90
Birth weight of the baby at the time of admission	≥2500 gm	98	226	286	421	110
	1500-2499 gm	82	154	149	163	61
	1000-1499 gm	15	14	19	22	4
	<1000 gm	1	1	7	3	0
Gestation	>37 weeks	122	269	319	432	114
	34-37 weeks	55	90	109	141	56
	< 34 weeks	19	36	33	36	5

Table no. 2 Morbidity profile

	2015	2016	2017	2018	2019 (till may)
Respiratory distress syndrome	9	8	15	21	3
Meconium aspiration syndrome	9	24	32	33	5
Other causes of respiratory distress	9	7	20	50	20
HIE/Moderate-severe birth Asphyxia	1/26	7/26	3/27	3/40	0/6
Sepsis/Pneumonia /Meningitis	28/4/0	61/23/0	77/2/1	66/2/0	10/1/0
Major congenital malformation	5	18	6	2	1
Jaundice requiring phototherapy	55	175	212	293	99
Hypothermia	0	1	1	8	4
Hypoglycemia	6	6	5	4	1
Others	36	45	55	77	25

Table no. 3 Mortality profile

	2015	2016	2017	2018	2019 (till may)	Total
Respiratory distress syndrome	3	1	1	0	0	5
Meconium aspiration syndrome	1	0	0	1	0	2
HIE/Moderate-severe birth Asphyxia	0	3	1	3	0	7
Sepsis/Pneumonia /Meningitis	2	5	1	3	0	11
Major congenital malformation	0	0	0	0	0	0
Prematurity	1	0	4	3	0	8
Others	5	1	0	1	0	7
Cause not established	0	0	0	0	0	0

Discussion

Data pertaining to disease pattern and mortality are useful for health care providers and policy makers to modify and plan treatment or interventions and evaluate the effectiveness of health care initiatives respectively. In our study out of total 1380 (75.2%) were inbourn and 453 (24.7%) were out born. This is comparable to the study by Rakesh Kumar et al., in 2019[8]. Similar to our study in studies by Baruah MN et al, Patil R et al, Rakholia R et al also the Significantly higher males were admitted in both inborn and out born groups[9-11]. Gender bias as a cause for higher number of male admissions needs to be further evaluated.

In our study 580 (31.6%) new bourns were pre term and 1256 (68.5%) were term babies which is comparable to the studies by Rakholia R et al, and Modi R et al[11,12]. According to our study neonatal jaundice was found to be the most common cause of admission 834 (45.4%), This is comparable to the study by Rakesh Kumar et al., Kotwal et al, Saini et al, and Prasad V et al[8,13-15]. Other prominent causes were sepsis 242 (13.2%), birth asphyxia 125 (6.8%), meconium aspiration syndrome 103 (5.6%). The commonest causes of neonatal morbidity are similar across various studies.

Mortality rate in this study was 40 (2.18%), Mortality rate reported varies between studies. This partly depends on the infrastructure of the treating facility. Mortality rate 16.9% NNPD 18.69% Prasad and 20.53% by Rakholia R et al [11,13].

In our study Most common reason for neonatal death was Sepsis/Pneumonia /Meningitis, 11 (0.6%), other most common causes for neonatal death was prematurity 8 (0.4%), HIE/Moderate-severe birth Asphyxia and others 7 (0.38%).

Other studies have reported prematurity as the commonest cause of mortality, this may partly be because of the fact that premature babies needs more specialized care and owing to infrastructure lack they are being referred from our hospital to better equipped centers whenever the parents are willing. The major causes of mortality remain same across studies.

Conclusion

With advances in diagnostic and treatment modalities as well as government initiatives to decrease the neonatal mortality significant achievements have been made. The infant mortality rate and neonatal mortality rate which plays an important role in health planning, has shown a considerable decline, still much is left to be done. Our study shows that neonatal jaundice birth asphyxia and sepsis are the commonest causes of admission. Common causes of mortality were birth asphyxia and sepsis and prematurity. Most of the morbidities and subsequent mortalities can be prevented by developing infrastructure and training staff for providing effective neonatal resuscitation, practice hand hygiene for prevention of sepsis and effective implementation of IMNCI for early diagnosis of danger signs, timely intervention and timely referral to tertiary care centers.

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