

To assess the major causes leading to admissions in our SNCU and their causes of death in relation to their conditions: an observational study

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Abstract

Aim: To assess the major causes leading to admissions in our NICU and their causes of death in relation to their conditions. **Materials and Method:** This was an observational study done in SNCU at Darbhanga Medical College and Hospital Darbhanga, Bihar, India. Data of all admitted neonates were analyzed with regard to age of babies, sex, weight, cause of admissions and their outcome. **Results:** During study period a total of 320 neonates were analyzed. Male were predominant over female with male to female ratio 1.42:1. Majority of newborns were to belong to low birth weight (48.44%) followed by normal birth weight (28.43%), very low birth weight (17.18%) and ELBW babies. Maximum number of babies were preterm 165 (51.56%), more than half of all the babies, followed by sepsis 42 (13.12%), birth asphyxia 31 (9.68%), neonatal jaundice 24 (7.5%), Meconium aspiration syndrome. 35 (10.93%). Out of 320 admitted babies 58 were died with a mortality rate of 18.12%. Maximum number of death was observed with preterm, 38 out of 58 with 65.51%, their various complications followed by birth asphyxia (18.96%). Third commonest cause of mortality was sepsis (8.62%) which is followed by MAS (6.89%). **Conclusion:** Prematurity, neonatal sepsis, birth asphyxia and meconium aspiration syndrome were the major indications of admissions. Prematurity, birth asphyxia and neonatal sepsis were major causes of mortality in my study. These mortalities can be reduced with improved management of antenatal and perinatal period, early recognition of conditions, timely intervention and early referral to higher centre.

Key words: Prematurity, Birth Asphyxia, Neonatal Sepsis, Low Birth Weight.

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Introduction

Neonatal period is the first 28 days of life since birth. It is considered as the most susceptible period for mortality and morbidity[1]. A country's health status is measured in terms of infant mortality. Neonatal mortality accounts for 2/3 rd of the infant mortality[2]. Current Neonatal Mortality Rate (NMR) in India is 34/1000 live births[3].

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India contributes to nearly 25% of global neonatal deaths[4]. Even though there is a drastic decline in NMR, Average Annual Rate of Reduction (AARR) is only less with 3.5%. UN Millennium Development Goals 2015 had seen a reduction of 47% of mortality. According to World Health Organization (WHO) 4 million newborn deaths occur worldwide every year[5]. Among these approximately 98% deaths occur in developing countries and are caused by infections, asphyxia, complications of prematurity and low birth weights[6]. Gradually care of neonates is improving globally specially in developing countries and more trained hands and resources are continuously growing. Prematurity, infections and birth asphyxia are the most common

causes of neonatal mortality. Many causes of neonatal morbidity and mortality are preventable. Besides vulnerability of newborn, morbidity and mortality also depends upon the level of care. Gradually care of neonates is improving globally specially in developing countries and more trained hands and resources are continuously growing. Prematurity, infections and birth asphyxia are the most common causes of neonatal mortality. Many causes of neonatal morbidity and mortality are preventable. Besides vulnerability of newborn, morbidity and mortality also depends upon the level of care [7]. A knowledge of pattern of admissions and their outcomes in an SNCU helps in making future planning, proper management and utilization of skilled hands and resources available. The aim of this study was to assess the major causes leading to admissions in our NICU and their causes of death in relation to their conditions, to address past uncovered aspects and gaps so that these will help to identify the more appropriate interventions that can be instituted for a better outcome.

Material and Methods

This study was a retrospective observational study done in department pediatrics, of NICU unit at

Results

Darbhanga Medical College and Hospital Darbhanga Bihar, India. All the babies admitted during January 2019 to December 2019 in NICU were analyzed with respect to their age in days, sex, birth weight, cause of admission, hospital stay and their outcome. Babies having incomplete data and those babies kept for observation only for less than 24 hours were excluded from the study. Facilities in our SNCU are as 35 beds having 12 multipara monitors, 20 radiant warmers, 10 phototherapy (LED type) units and 10 syringe pumps. All the diagnoses were made by their standard definitions.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means and standard deviations were calculated. Test applied for the analysis were chi-square test. Level of significance was set at ≤ 0.05 .

Table-1: Gender Based Admission Pattern

Gender	No. of admissions	Percentage	p-value
Male	188	58.75	≤ 0.05
Female	132	41.25	
Total	320	100	

Test applied: chi-square test

Table-2: Birth Weight Based Admission Pattern

Birth weight	No. of admissions	Percentage	p-value
>2.5kg	91	28.44	≤ 0.05
LBW	155	48.44	
VLBW	55	17.18	
ELBW	19	5.94	
Total	320	100	

Test applied: chi-square test

Table-3: Cause based admission pattern

Cause	No. of admissions	Percentage	p-value
Preterm	165	51.56	≤0.05
Neonatal Sepsis	42	13.12	
MAS	35	10.93	
Birth Asphyxia	31	9.68	
Neonatal jaundice	24	7.5	
Post term	8	2.5	
Surgical	10	3.12	
Hypoglycemia	2	0.62	
Others (CHD, congenital malformation, aspiration)	3	0.93	

Test applied: chi-square test

Table- 4: Pattern of admission and death based upon the birth weight

Birth weight	Death	Percentage	p-value
>2.5 kg	15	25.87	>0.05
LBW	15	25.87	
VLBW	21	36.20	
ELBW	7	12.06	
Total	58	100	

Test applied: chi-square test

Table- 5: Distribution of diseases causing death

Cause of death	No. of deaths	Percentage	p-value
Preterm	38	65.51	>0.05
Birth Asphyxia	11	18.96	
Neonatal sepsis	5	8.62	
MAS	4	6.89	
Total	58	100	

Test applied: chi-square test

Discussion

The benefits of neonatal intensive care are clear and there has been a significant fall in neonatal mortality rate in developed countries with the advent of mechanical ventilation and the concept of neonatal intensive care[8,9]. In our study, a total of 320 babies were analyzed retrospectively. Male neonates predominate over female neonates with a male to female ratio of 1.42:1. The male predominance in our

study is consistent with other studies[10,11]. [Table 1]. This predominance of male babies indicates that male neonates are more vulnerable during the neonatal period, a finding in agreement with the well described biological survival of girls[12], With regard to birth weights of neonates admitted, maximum number of neonates belonged to LBW.

48.43%) followed by normal birth weight and VLBW (17.18%). Similar findings were observed in studies done by Bhagat et al. and Prasad V et al[13,8]. More than half (51.56%) of neonates were preterm and were found as most common indications of admission in NICU. Similar observations were found in studies done by Bhagat et al., Elizabeth Uet al, and Prakash J et al[9,13,14]. Many studies reported lesser number of preterm admission in comparison to our study[15,10]. Second most common indications of NICU admission in our study were neonatal sepsis. Similar observation was found by Syed R. Ali[16]. Many researchers reported birth asphyxia as second most common cause of NICU admission[13]. Other important causes of indication of admission in NICU were birth asphyxia (9.68%), meconium aspiration syndrome (10.93%) and neonatal jaundice (7.5%). Narayan R reported neonatal jaundice as most common cause of admission as most of the babies in their NICU came from high altitude[10][Table 2,3].

Out of 320 neonates 58 (18.12%) died in our study. Similar observations were found in studies of Bose O Toma et al, Ike Elizabeth U et al. and Walana et al [9,17,18]. Narayan R found 8% mortality in their study[10]. Mortality rate of any neonatal intensive care unit depends upon many factors other than the clinical condition of the baby such as the infrastructure, man power, skilled hands etc. Hence the mortality rate reports vary widely in different studies from different regions. Mortality rate in relation to birth weight were observed as in Normal weight (25.87%), VLBW (36.20%), LBW (25.87%) and ELBW (12.06%).[Table 4,5].

Most common condition causing highest mortality was preterm associated with their different complications. Second most common cause of mortality was birth asphyxia and third commonest was neonatal sepsis followed by meconium aspiration syndrome. Similar observations were found by Bhagat et al[9]. Low birth weight is one of the leading causes of admission and mortality in most of the developing countries[19]. Immaturity tends to increase the severity and complications of most of the neonatal diseases. Immature organs, therapeutic complications and specific conditions and complications in premature babies contribute to high rate of morbidity and mortality. Morbidity and mortality inversely related to their gestational age. Therefore, prevention of morbidity and mortality related to prematurity will significantly reduce overall morbidity and mortality. Appropriate antenatal care, good obstetric practices, proper

referral, improvement of facilities for caring for preterm babies as well as proper newborn care practices have been found to reduce morbidity and mortality from prematurity[20]. Neonatal sepsis is a significant cause of neonatal morbidity and mortality particularly in preterm, LBW babies[21,22]. In our study it was the third most common cause of mortality. The incidence of neonatal sepsis in the developed countries is 1-10/1000 where as it is roughly three times in developing countries[23].

It is estimated that around 23% of all newborn deaths are caused by birth asphyxia[24] following improvement in antenatal and obstetrical care in most of the developed countries the incidence of birth asphyxia has reduced significantly and less than 1 per 1000 live births die from this. Syed R Ali et al and Saleem M et al found birth asphyxia as most common cause of mortality in their studies[16,11].

Conclusion

Prematurity, low birth weight, birth asphyxia, neonatal sepsis, meconium aspiration syndrome, neonatal jaundice was the leading causes of admission in SNCU. Prematurity, birth asphyxia neonatal sepsis was the most common causes of mortality. These mortalities can be reduced with better management of antenatal care, improved perinatal care, promoting institutional delivery, early recognition and timely intervention with early referral to tertiary care centre.

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