The Pattern of Neonatal Admission and Outcome in Special Care Newborn Unit of A Medical College Hospital in Northern Bangladesh

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ABSTRACT

Background: Among the causes of under-five mortality neonatal mortality contributes the highest. This indicator possesses a great impact towards achieving SDG for Bangladesh. This study will help in understanding the indicators and to plan allowance of proper resource and planning to the proper field.

Objective: To describe the pattern of neonatal admission and outcome in a level II SCANU in a medical college hospital in northern part of Bangladesh.

Method: A retrospective descriptive study of neonatal admissions in SCANU of Rangpur Medical College Hospital from January 2017 to December 2019 total 2 years.

Results: A total 6583 babies were admitted in this period. Among them 1808 (27.4%) was inborn and 4775(72.5%) out born. Male 4103(62.3%) Female 2480(37.6%), male female ratio 1.6:1. Major causes of admission was prematurity low birth weight 2786(42.3%), birth asphyxia 2100(31.9%), neonatal jaundice721 (10.9%), neonatal sepsis 710(10.8%), others 266(4.04%). Common Diseases contributing to death were prematurity low birth weight 246(39.6%), Birth asphyxia 240 (38.6%), neonatal sepsis 86 (13.8%).Overall mortality rate was 9.43%.

Conclusion: Preterm low birth weight and its complications was the major cause of mortality while perinatal asphyxia was the important cause of admission among the outborn neonates. Most of the cases were preventable if we ensure proper antenatal care and counselling for hospital delivery, proper resuscitation practice and timely referral to facility. Improvement in neonatal care at different levels will further reduce the neonatal mortality.

Keywords: Neonatal, Retrospective Descriptive Study, Mortality Rate.

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INTRODUCTION

Neonatal mortality during the first 28 days of life accounts for two thirds of deaths in infancy, and nearly two fifths of all deaths in children under age 5.[1-3] The first 28 days of life – the neonatal period – represent the most vulnerable time for a child's survival. In 2016, 2.6 million deaths, or roughly 46% of all under-five deaths, occur during this period. This translates to 7000 newborn deaths every day. The majority of the neonatal deaths are concentrated in the first day and week, with about 1 million dying on the first day and close to one million dying within the next six days.[4]

Infant and child mortality rates reflect a country's level of socioeconomic development and quality of life. They are used for monitoring and evaluating population and health programmes and policies. The rates are also important for monitoring progress towards the United Nations SDG. With the end of MDGs era in 2015, international community has agreed on a new framework, the Sustainable Development Goals (SDGs).[5,6] World has recognized the fact that without substantial reduction in neonatal deaths, SDGs cannot be met for reducing under five mortality. The proposed SDG target for neonatal mortality represents a renewed commitment to the world's newborn: by 2030, end preventable deaths of newborns to ≤12 deaths per 1,000 live births.[6] Thus the study on neonatal mortality is of great importance to monitoring the progress of children's health status.

Globally important causes of neonatal mortality (NNM) are prematurity, birth asphyxia and sepsis in low income countries[3]

whereas prematurity and malformations are leading causes of death in developed countries. Birth weight is a key factor for neonatal mortality. It has been proved by different studies by WHO that birth weight <2.5KG is indirectly related to neonatal mortality and its share in neonatal mortality is about 15%. Low birth weight contribution to neonatal mortality ranges from 6% in high income countries to 30% in low income countries and main aetiology is prematurity with its complications.[7] In developing countries all these causes i.e. prematurity, birth asphyxia and sepsis are preventable.[8] Neonatal mortality and disease pattern is a sensitive indicator of availability, utilization and effectiveness of mother and child health services in the community.[9] Community based data is difficult to gain in our setup, so hospital based data is used to assess burden of this problem. Prognosis of sick neonates depends upon severity of intrinsic illness and provided medical care. High NNM in our country could be due to both these factors. Bangladesh has made substantial progress in the reduction of under-five mortality. A recent estimate suggests that the neonatal and post neonatal mortality reduced from 65/1,000 in 1990 to 31/1,000 in 2018. The successive DHS surveys conducted in Bangladesh since confirm a declining trend in childhood mortality. Still neonatal mortality holds a major share of about 60% in total under five mortality.

To reduce newborn mortality, highly cost-effective interventions exist.[10] However, there is no single intervention which fits all programmatic approaches for reduction of neonatal mortalities.[11]

METHODOLOGY

This descriptive observational study was conducted in the Special care Neonatal Unit of The Rangpur Medical College Hospital from 1st January 2017 to 31st December 2018. The study was initiated after seeking permission from Institutional Review Board. This hospital is a tertiary care hospital and neonatal unit receives both inborn and out born neonates. All neonates who were admitted in neonatal unit were included in the study. Data of all admitted neonates from 1st January 2017 to 31st December 2018 were collected from admission register of the unit. Both quantitative data (age, gestational age and weight) and qualitative data (gender, final diagnosis and outcome i.e. neonate was discharged, left against medical advice or died) were recorded. Neonate is defined as a baby up to first 28 days of life. Birth weight less than 2.5 kg was defined as low birth weight (LBW) and live born neonate before 37 completed weeks was defined as preterm/premature. Diagnosis was mainly clinical with specific laboratory or radiological findings. Diagnosis of birth asphyxia was based on history of delayed cry at birth. Sepsis was diagnosed on basis of history and examination supported by complete blood count with platelets, C reactive proteins (CRP) and positive blood, urine or cerebrospinal fluid (CSF) culture. Neonatal jaundice was diagnosed after assessment of serum bilirubin and found to be in pathological zone in age, weight and gestation specific range.

Congenital malformations included neonates with different anomalies and syndromic features. Bleeding disorders, infant of diabetic mother, metabolic fits, pyomeningitis, seizure disorder, urinary tract infections, tetanus etc. were included in others . All data were entered and analysed using computer software SPSS version 25. Qualitative and quantitative variables were presented as frequencies and percentages.

RESULTS

A total 6583 babies were admitted in this period. Among them 1808(27.4%) was inborn and 4775(72.5%) out born. Male 4103(62.3%) Female 2480(37.6%), male female ratio 1.6:1.Major causes of admission was prematurity low birth weight 2686(40.80%), birth asphyxia 2100(31.9%), neonatal sepsis 721(10.9%), neonatal jaundice 710(10.8%), others 366(5.56%). Diseases contributing to death were prematurity low birth weight 246(39.6%), Birth asphyxia 240(38.6%), neonatal sepsis 86(13.8%), Neonatal Jaundice 15(2.4%). Other conditions like congenital anomalies, surgical conditions etc. Contributed 34(5.4%).Overall mortality rate was 9.43%. Among the admitted neonates 4281(65.03%) was successfully discharged, 1011(15.35%) was referred or other and 1291(19.6%) left against medical advice (LAMA).

Table 1: Pattern of admissions

Disease	n=number of patients	Percentage
Preterm low birth weight and complications	2686	40.80%
Birth asphyxia	2100	31.90%
Neonatal sepsis	721	10.9%
Neonatal jaundice	710	10.78%
others	366	4.04%

Table 2: Causes of neonatal mortality

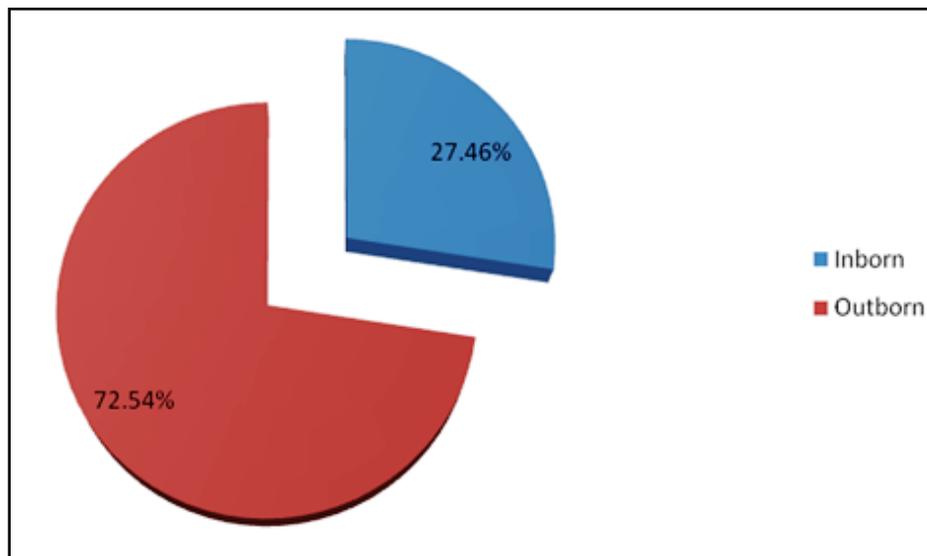| Causes	Number, (n)	Percentage
Preterm lowbirth weight and its complications	246	39.6%
Perinatal asphyxia	240	38.6%
Neonatal sepsis	86	13.8%
Others	49	7.9%

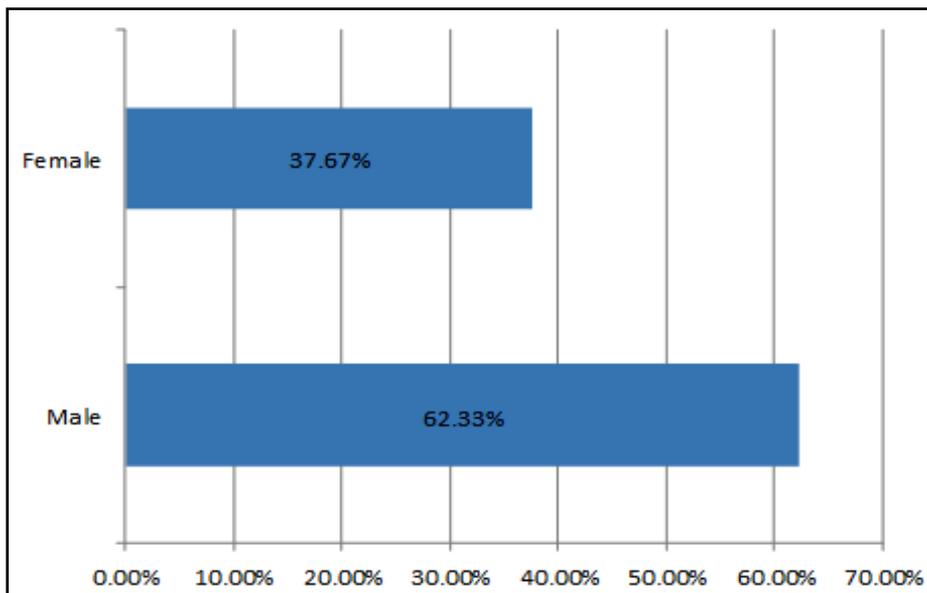**Figure 1: Place of delivery**

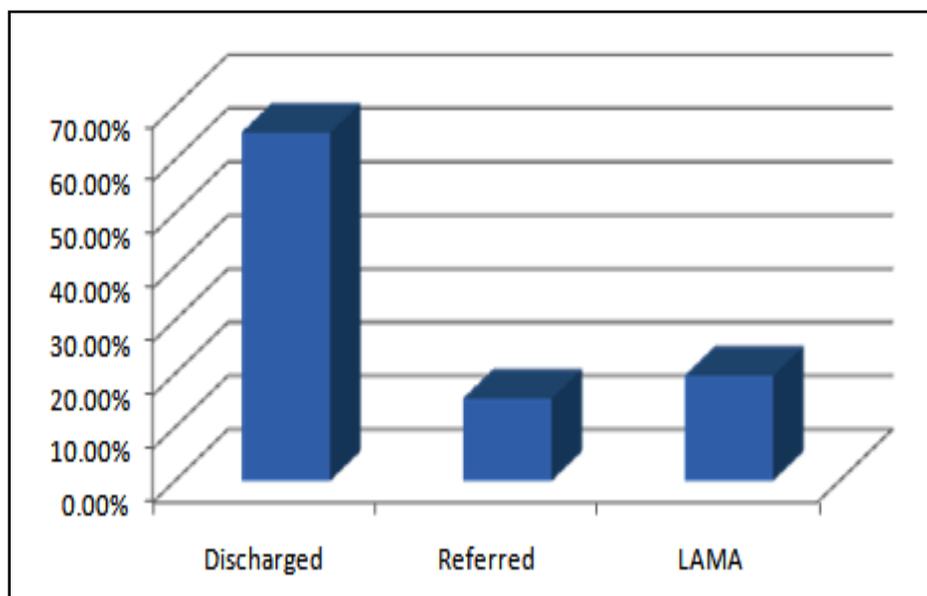**Figure 2: Pattern of admission according to sex**

Figure 3: Outcomes of neonatal admissions

DISCUSSION

This study assessed the pattern, causes and outcomes of neonatal admissions in Special Care Newborn Unit (SCANU) of a medical college hospital in northern Bangladesh. The study revealed that more male neonates 62.3% were admitted compared to female neonates 37.6%, representing male to female ratio of 1.6:1. Some studies have reported similar observation.[13-15] The preponderance of male neonates to suffer various conditions which usually result in admission cannot be explained by this study. However, this has been partly attributed to relatively well developed lungs in female neonates at the time of birth. Major causes of admission was prematurity low birth weight 2686(40.80%), birth asphyxia 2100(31.9%), neonatal sepsis 721(10.9%), neonatal jaundice 710(10.8%), others 366(5.56%). A study done by BA Naeem at all shows low birth weight accounted for 40.54% of the total admissions. Birth asphyxia was the major cause of admission (24.3%), followed by jaundice (17.9%), prematurity (16.5%), sepsis (16%), meconium aspiration syndrome (6%), infant of diabetic mother (2.7%), pneumonia (2.5%), meningitis (1.3%).[16] Another study was done by Y Sadia shows birth asphyxia 3518 (31.89%) was the most common cause of hospital admissions followed by prematurity 2907 (26.36%) and neonatal sepsis 1865 (16.91%). Diseases contributing to death were prematurity low birth weight 246(39.6%), Birth asphyxia 240(38.6%), neonatal sepsis 86(13.8%), Neonatal Jaundice 15(2.4%). Other conditions like congenital anomalies, surgical conditions etc. Contributed 34(5.4%).Overall mortality rate was 9.43%. Similar study shows highest number of deaths was because of prematurity 469 (39.32%) followed by asphyxia neonatorum 359 (30.68%) and neonatal sepsis 180 (15.38%).[17]

CONCLUSION

Preterm low birth weight and its complications was the major cause of mortality while perinatal asphyxia was the important cause of admission among the out born neonates. Most of the cases were preventable if we ensure proper antenatal care and counselling for hospital delivery, proper resuscitation practice and timely referral to facility. Improvement in neonatal care at different levels will further reduce the neonatal mortality.

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