

**ORIGINAL ARTICLE**doi: <http://dx.doi.org/10.3329/mediscope.v5i2.37141>**Pattern and outcome of admissions in a neonatal high dependency unit of a medical college hospital in Khulna, Bangladesh**MB Ali¹✉, AA Maruf², MM Rashid³**Abstract**

To determine the pattern and outcome of admitted patients in neonatal high dependency unit of a medical college hospital in Khulna, Bangladesh the patients in this study were included from January 2016 to December 2016. Data of all the neonatal admissions were recorded and analyzed for age, gender, weight at the time of admission, place of delivery, the reason for admission, duration of hospital stay and the final outcome of the patients. A total of 433 neonates were admitted during the year 2016. Among them, 262 (60.5%) were male and 171 (39.5%) female patients. Majority of the newborns, 255 (58.9%), were admitted within 24 hours of life. Most of the patients, 365 (84.3%), were born in hospitals/ private clinics and the others, 68 (15.7%), at home. Major causes of admissions were sepsis 115 (26.6%), neonatal jaundice 102 (23.6%), low birth weight (LBW) 61 (14.1%), birth asphyxia 48 (11.1%), preterm 27 (6.2%), meconium aspiration 22 (5.1%), respiratory distress syndrome (RDS) 19 (4.4%) and intrauterine growth retardation 18 (4.2%). Most of the patients, 215 (49.7%), were admitted for 2-5 days followed by 118 (27.3) patients for 6-10 days. Three hundred seventy (85.4%) babies were discharged after improvement, 18 (4.2%) babies referred to higher centers, 20 (4.6%) discharged against medical advice and 25 (5.8%) deceased. The deceased were most frequently with neonatal sepsis 9 (36.0%) followed by prematurity 6 (24.0%), birth asphyxia 3 (12.0%), RDS 2 (8.0%), meconium aspiration 3 (12.0%) and multiple congenital anomalies 2 (8.0%). Sepsis, neonatal jaundice, LBW, birth asphyxia were the main causes of neonatal admissions. Common causes of neonatal mortality were sepsis, prematurity and birth asphyxia. The majority of morbidities and subsequently the mortalities can be prevented by improving antenatal care, maternal health, timely intervention, referring at an appropriate time to tertiary care centers.

Keywords: neonatal high dependency unit, sepsis, low birth weight, neonatal jaundice, intrauterine growth retardation, respiratory distress syndrome.

Introduction

Nearly 3.5 million babies are born in Bangladesh each year accounting for 2.7% of global births.¹ Of them, 74000 die before completing the first four weeks of life.² Globally neonatal mortality rate declined from 36 deaths per 1000 live births in 1990 to 19 deaths per

1000 live births in 2015 and in Bangladesh mortality rate declined from 63 deaths per 1000 live births in 1990 to 23 deaths per 1000 live births in 2015.² Neonatal period (0-28 days of life) is a very vulnerable period of life and most diseases are preventable at neonatal period.³ The most common causes

1. MB Ali, MBBS, DCH, Assistant Professor, Department of Pediatrics & Neonatology, Gazi Medical College Hospital, Khulna. Email: drbarkot.ch@gmail.com

2. AA Maruf, MBBS, FCPS, Department of Anaesthesia & Intensive Care, Border Guard Hospital, Dhaka

3. MM Rashid, MBBS, DA, Assistant Professor, Department of Anaesthesiology, Gazi Medical College Hospital, Khulna

of neonatal deaths are infections, prematurity and intrapartum-related causes such as “birth asphyxia”; the frequencies of these deaths vary between and within regions.⁴ Recently, global efforts to reduce neonatal mortality have focused primarily on community-based interventions largely because the majority of births and deaths occur at homes, and access to facilities with capacity to manage newborns has been limited.⁵ These interventions have included trained birth attendants to provide neonatal resuscitation and immediate care after delivery and encouraging perinatal hand washing.^{6,7} To further support important community-based interventions and expand life-saving services, improvements in access to quality facility-based neonatal care are required.⁸ Neonatal units in hospitals need to be specialized for the care of babies born early, born with a low weight or who are born at full term but have a medical condition that requires specialized treatment.

There are three different categories of neonatal care available worldwide.⁹ Neonatal intensive care unit provides care for babies with the most complex problems who require constant supervision and monitoring and usually mechanical ventilation. Neonatal high dependency unit (NHDU) involves care for babies who need continuous monitoring, for example, low birth weight (<1 kg), receiving continuous positive airway pressure or intravenous feeding, but who do not require intensive care. Special care unit provides care for all other babies who cannot reasonably be looked after at home by their mothers. Babies receiving special care may need to have their breathing and heart rate monitored, be fed through a tube, supplied with extra oxygen or treated for jaundice.

Advancement in perinatal and neonatal care have significantly helped in reducing neonatal mortality rate in developed countries, but the mortality and morbidity are still high in developing countries.¹⁰ There are very scanty data which are available regarding the neonatal mortality and morbidity pattern in Bangladesh. Data on morbidities are needed for preventive strategies to save neonatal

lives. This study was conducted to determine the disease pattern and outcome of neonates admitted to the NHDU of a medical college hospital located in Khulna, Bangladesh.

Materials and Method

This study was conducted at the NHDU of Gazi Medical College Hospital, Khulna from January 2016 to December 2016. This neonatal unit admits all patients except those requiring mechanical ventilation. The data of all the neonatal admissions including age, gender, weight on admission, place of delivery, the cause of admission (diagnosis), duration of hospital or clinic stay and final outcome of the babies were documented and analyzed.

The diagnosis was mainly clinically or based on World Health Organization definition for pre-maturity; liveborn neonates delivered before 37 weeks from the 1st day of last menstrual period and low birth weight (LBW) with a birth weight of less than 2.5 kgs. Neonatal jaundice was diagnosed by assessing of serum bilirubin level. Sepsis and meningitis were diagnosed on clinical grounds along with positive blood culture and cerebrospinal fluid examination. Congenital heart disease was diagnosed on the basis of electrocardiographic changes, chest X-ray and confirmed by echocardiography. Birth asphyxia was mainly clinical diagnosis on the basis of Sarnat staging. Haemorrhagic disease of the newborn was diagnosed on the clinical ground along with an increase in prothrombin time.

Data were collected, compiled and entered in a spreadsheet (Microsoft Excel) and analyzed using appropriate statistical tools. Results were reported as a percentage (%).

Results

A total of 433 neonates were admitted during the year 2016. Among them, 262 (60.5%) were male and 171 (39.5%) female patients (Fig. 1). Majority of the newborns, 255 (58.9%), were admitted within 24 hours of life (Fig. 2). Most of the patients, 365 (84.3%), were born in hospitals/ private clinics and the others, 68 (15.7%), at home (Fig. 3). Table 1

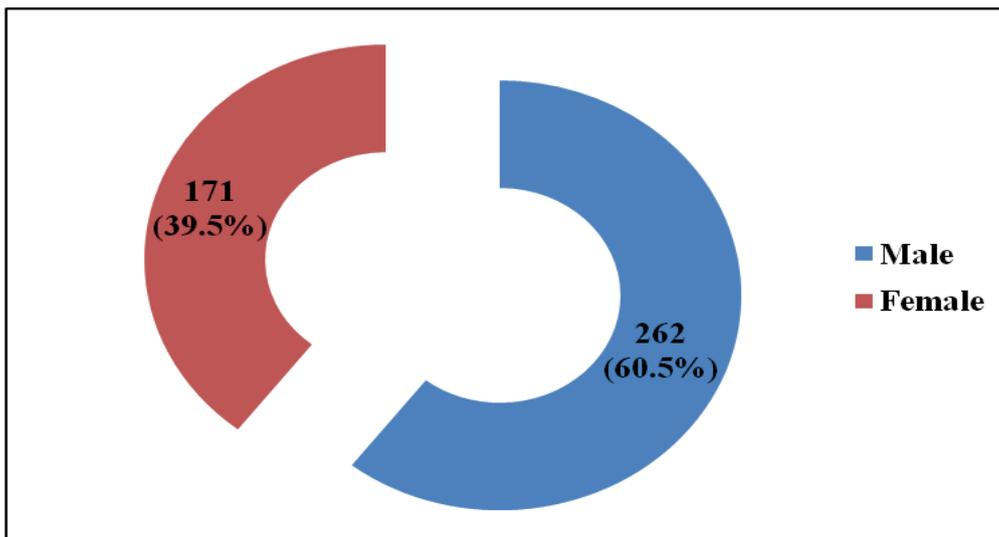


Fig. 1. Gender distribution of the patients, n = 433.

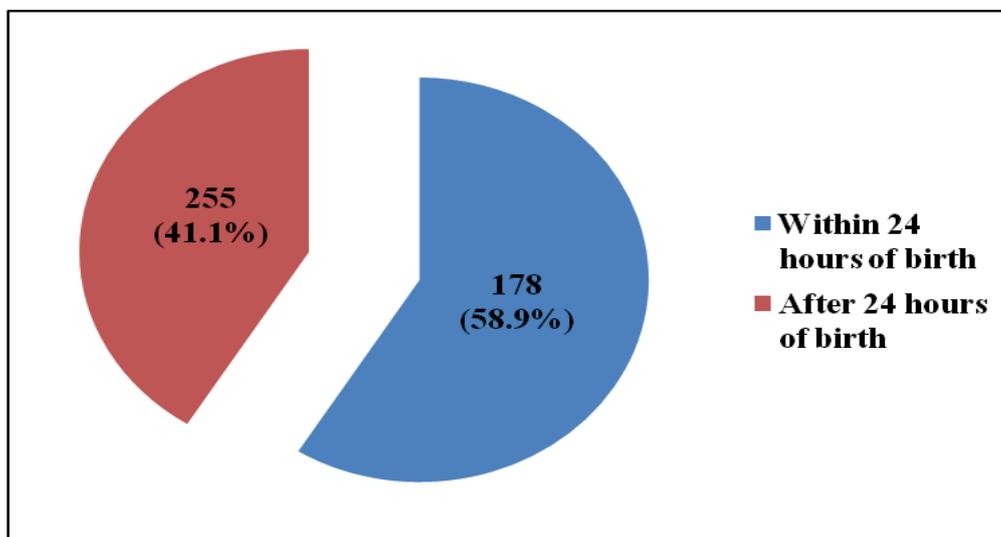


Fig. 2. Time of admission of the patients, n = 433.

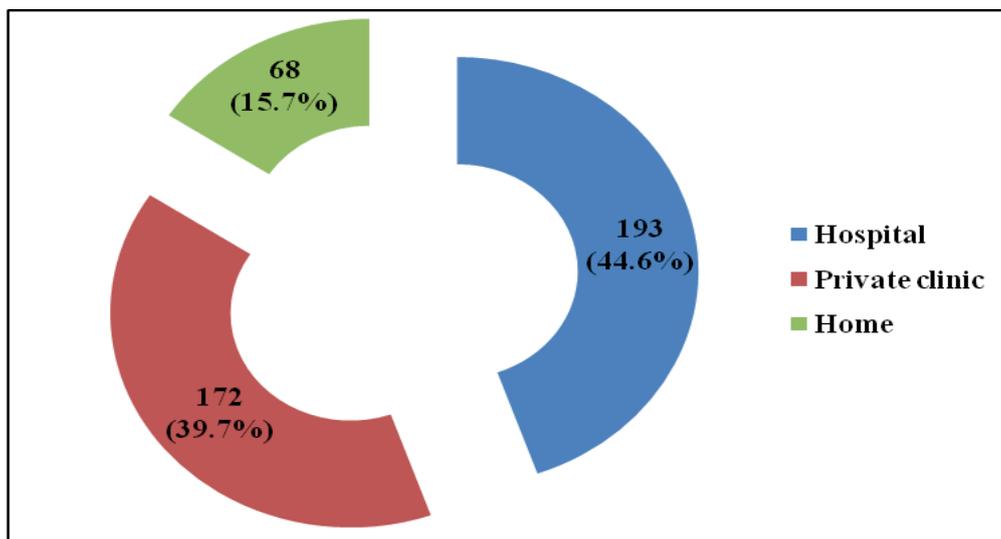


Fig. 2. Time of admission of the patients, n = 433.

Table 1. Indications of admission of the patients, n = 433

Indications of admission	Number	%
Neonatal sepsis	115	26.6
Neonatal jaundice	102	23.6
Birth asphyxia	61	14.1
Low birth weight	48	11.1
Preterm delivery	27	6.2
Meconium aspiration	22	5.1
Respiratory distress syndrome	19	4.4
Intra uterine growth retardation	18	4.2
Congenital heart disease	7	1.6
Multiple congenital anomalies	4	0.9
Haemorrhagic diseases of newborn	3	0.7
Surgical conditions		
Imperforated anus	4	0.9
Duodenal atresia	2	0.4
Congenital mega colon	1	0.2
Total	433	100.0

Table 2. Hospital or clinic stay of the patients, n = 433

Duration	Number	%
≤1 day	39	9.0
2-5 days	215	49.7
6-10 days	118	27.3
11-14 days	40	9.3
≤14 days	21	4.7
Total	433	100.0

Table 3. Outcome of the admissions, n = 433

Outcome	Number	%
Discharge after improvement	370	85.4
Referral to others	18	4.2
Discharge against medical advice	20	4.6
Death	25	5.8
Total	433	100.0

Table 4. Distribution of deaths, n = 25

Distribution	Number	%
Prematurity	6	24.0
Neonatal sepsis	9	36.0
Birth asphyxia	3	12.0
Respiratory distress syndrome	2	8.0
Meconium aspiration	3	12.0
Multiple congenital anomalies	2	8.0
Total	25	100.0

shows the indications of admission of the patients. Major causes of admissions were sepsis 115 (26.6%), neonatal jaundice 102 (23.6%), LBW 61 (14.1%), birth asphyxia 48 (11.1%), preterm 27 (6.2%), meconium aspiration 22 (5.1%), respiratory distress syndrome (RDS) 19 (4.4%) and intrauterine growth retardation 18 (4.2%). Table 2 shows the duration of the hospital or private clinic stay of the patients. Most of the patients, 215 (49.7%), were admitted for 2-5 days followed by 118 (27.3) patients for 6-10 days. The outcome of the admissions is shown in Table 3. Three hundred seventy (85.4%) babies were discharged after improvement, 18 (4.2%) babies referred to higher centers, 20 (4.6%) discharged against medical advice and 25 (5.8%) deceased. Table 4 shows the distribution of deaths. The deceased were most frequently with neonatal sepsis 9 (36.0%) followed by prematurity 6 (24.0%), birth asphyxia 3 (12.0%), RDS 2 (8.0%), meconium aspiration 3 (12.0%) and multiple congenital anomalies 2 (8.0%).

Discussion

Neonatal morbidity and mortality rates reflect a nation's socioeconomic status, as well as the efficiency and effectiveness of their healthcare services.¹¹ These important indicators are useful in planning for improved healthcare delivery.¹¹ A large majority of newborn babies do not develop any serious problem or difficulties and require only minimal care, which can be provided by the mother if properly supervised by a health worker. High-risk mothers are likely to give birth to preterm or LBW babies who suffer a large number of problems.¹² It is essential to keep an eye over neonatal services to make it move on the track to reduce neonatal morbidities and mortalities.

This study was conducted to delineate the morbidity pattern, outcome and factors leading to mortality of neonates admitted to a medical college hospital situated in southern part of Bangladesh. In this study, a total of 433 neonates were admitted during the period of the study. Male babies were predominant in the present study, which was similar to other studies.^{13,14} Male babies are

given priority to bring to the hospital for seeking health services and get more attention from caregivers. In the present study, most of the admissions (58.9%) occurred during the first 24 hours of life. This was similar to a study conducted in Nepal, which found the 44.5% of admissions occurred during the first 24 hours of life.¹⁵ This emphasizes the fact that most of the neonatal problems present within the first day of life, during which early detection and intervention is crucial.

Sepsis accounted for about 26.6% cases requiring admission into NHDU. Jan et al reported higher incidences (41.3%) of neonatal sepsis.¹⁶ However, lower incidences (6.4-10.5%) were reported by other authors in their studies.^{14,17} Risk factors for neonatal sepsis during the antenatal, intrapartum and postnatal period are equally important and should be taken into consideration for its prevention.

Neonatal jaundice is another common cause of admissions, and in the present study it was 23.6% of admissions. Higher incidences (36.2-54.0%) have been reported in other studies.^{18,19} Cases of neonatal jaundice were mainly admitted for phototherapy and exchange transfusion. However, these could have been curtailed by early detection, bilirubin monitoring and effective phototherapy.

For more than 25 years, LBW has been observed to be one of the major risk factors for neonatal admissions in multiple studies conducted in many developing countries.^{19,20} In this study, LBW was found in 14.1% of patients which is similar to another study conducted in Bangladesh they found LBW 13.3% among their patients.²¹ The incidence of LBW was 39.0% in a study conducted in Pakistan, 20.0% in India, and 11.0% in an Ethiopian one.²²⁻²⁵ Birth asphyxia accounted for 11.1% of the admissions in this study. The incidence is almost similar to the study conducted by Butt et al and much lower than reported from South Africa.^{18,26} So, adequate attention is to be paid in training

of health workers who can effectively reduce the incidence as well as its severity and decrease a load of admissions at tertiary care level.

Preterm births are estimated to be substantially higher in developing countries.²⁷ In this study, prematurity was the reason for admission in 6.2% of the neonates. This rate was similar to a study which reported that 6.8% of the neonates were admitted for prematurity.²²

Mortality rate (5.8%) observed in this study is lower than that of the mortality rates observed in a study conducted by Rakholia et al.²⁸ The most common causes of mortality were sepsis 36.0% followed by prematurity 24.0%, birth asphyxia 12.0%, RDS 8.0%, meconium aspiration 12.0% and multiple congenital anomalies 8.0%. A study published by Indian Council of Medical Research (ICMR) reports sepsis (32.8%) as the major cause for neonatal mortality followed by birth asphyxia (22.3%) and prematurity (16.8%).²⁹ In the study done at Jawaharlal Institute of Postgraduate Medical Education & Research, sepsis was the cause for death in 52.3% of the neonates followed by birth asphyxia and injuries (29.2%).³⁰ A study conducted by Rashid et al reported most common causes of mortality were RDS followed by birth asphyxia and sepsis.³¹ The mortality depends upon the stage of the disease and facilities available in a particular hospital. Moreover, an attempt should be made to keep it as low as possible.

Conclusion

Sepsis was the leading cause of admission into the NHDU of Gazi Medical College Hospital, Khulna, followed by neonatal jaundice and LBW. Majority of the admissions occurred within the first 24 hours of life. In spite of many advances in neonatal care, the above factors still continue to be the leading causes of morbidity in neonates. Common causes of neonatal mortality were sepsis, prematurity and birth asphyxia. The majority of morbidities and subsequently the mortalities can be prevented by improving antenatal care, maternal health, timely intervention,

referring at an appropriate time to tertiary care centers for high-risk cases, preventing preterm deliveries and care of neonates at centers with good facilities.

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