

Audit of Neonatal Morbidity and Mortality in A Tertiary Care Hospital, Sylhet

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Abstract

Background: To know the disease pattern and causes of morbidity & mortality of patients admitted to the neonatal unit in a tertiary care hospital in Sylhet, Bangladesh. **Methods:** This retrospective study was conducted in the neonatal unit from December 2014 to November 2015. Data of all the patients admitted to the neonatal unit during study period was analyzed for, age, sex, weight, gestational age, place and mode of delivery, maternal antenatal events, disease pattern and their outcome. **Results:** A total of 985 patients were admitted during study period. Among 985 cases 566(57.5%) were male and 419(42.5%) were female. 450(45.6%) were admitted at the age of less than 24 hours. 122 (12.4%) were preterm babies. 202(20.5%) were low birth weight. 693(70.4%) were delivered in hospital. Main causes of admission were perinatal asphyxia 398(40.4%), neonatal sepsis 164 (16.6%), preterm LBW 122(12.4%), Meconium Stained Baby (MSB) 88(8.9%), Intrauterine Growth Retardation (IUGR) 80(8.1%), neonatal jaundice 62(6.2%), Infant of Diabetic Mother (IDM) 30(3.0%), Transient Tachypnoea of Newborn (TTN) 15(1.5%), Meconium Aspiration Syndrome (MAS) 10(1.1%), Respiratory Distress Syndrome (RDS) 6(0.6%) and congenital anomaly 10(1.1%). Most of the deaths were associated with preterm LBW (6.5%), perinatal asphyxia with Hypoxic Ischaemic Encephalopathy (HIE) (4.5%), sepsis (2.4%), RDS (16.7%), MAS (10%). **Conclusion:** Preterm LBW, perinatal asphyxia and neonatal sepsis were the three leading cause of neonatal morbidity & mortality. These findings could be important in identifying the areas requiring attention to improve the perinatal care and also to manage the problems associated with them.

Key words: Neonate; Morbidity; Mortality; Low birth weight.

INTRODUCTION

Bangladesh is one of the few countries in developing world that has still higher infant mortality rate. Neonatal deaths account for a large proportion of infant death. According to BDHS 2011, NMR was 28/1000 live births and IMR was 39/1000 live births¹. Neonatal outcome is an important indicator of obstetric and neonatal health care.

The neonatal period is described as less than 28 days of life and may be further subdivided into very early (birth to less than 24 hours), early (Birth to less than 7 days), and late neonatal periods (7 days to less than 28 days). Neonatal mortality is highest during the first 24 hours of life, and major causes of neonatal mortality are diseases associated with preterm birth and Low Birth Weight (LBW), perinatal asphyxia, and sepsis². Majority of the causes of neonatal morbidity in our country are preventable.¹ Clinical audits of neonatal morbidity and mortality can identify specifically the problem areas which can be addressed later.

MATERIALS AND METHODS

This retrospective study was carried out over a period of 1 year from December 2014 to November 2015 in the neonatal unit of North East Medical College & Hospital in Sylhet, Bangladesh. This hospital has all facilities of level II neonatal care.

We analyze the admission charts of all the patients. Records retrieved from the charts was entered into prepared Performa, which included the information regarding age at admission, weight, sex, gestational age, mode of delivery, place of delivery, indication of admission, final diagnosis, and outcome (Discharged or died in first 28 days of life).

Diagnosis was mainly clinical or based on WHO definition for prematurity (Live born neonates delivered before 37 weeks from 1st day of Last Menstrual Period (LMP) and low birth weight (Less than 2.5 kg). Perinatal asphyxia was diagnosed on clinical basis and according to Sarnat and Sarnat staging and sepsis was diagnosed clinically and on blood culture. Data was entered and interpreted in SPSS (Statistical Package for Social Sciences) version 18. Frequency and cross tables were formulated.

RESULTS

Table 1: Out of 985 patients, 566 (57.5 %) were males and 419 (42.2%) were female.

Sex	Frequency	Percentage (%)
Male	566	57.5
Female	419	42.5
Total	985	100

Table 2 : 728 (73.9%) were admitted at the age of less than 24 hours.

Age at admission	Frequency	Percentage (%)
<12 hours	450	45.6
12-24 hours	278	28.2
1-3 days	85	8.6
>3 days	172	17.4

Table 3 : 122 (12.4%) of the total admissions were preterm. Among them, majority 88 (72.1%) were delivered at 34-37 weeks of gestation.

Gestational age	Frequency	Percentage (%)
Preterm	122	12.4
34-37 wks	88	72.1
30-33 wks	21	17.2
<30 wks	13	10.6
Term	863	87.6

Table 4 : 202 (20.5%) of the total admissions were Low Birth Weight (LBW), and 10 (1.0%) were Large for Gestational Age (LGA).

Birth weight	Frequency	Percentage (%)
Normal(2.5-4 kg)	773	78.5
LBW(<2.5kg)	202	20.5
LGA(>4kg)	10	1.0

Table 5 : 292 (29.6%) were delivered at home, while more than double (70.4%) were at hospital. Among hospital delivery, 45.7% were inborn and 24.7% referred from different hospitals.

Place of delivery	Frequency	Percentage (%)
Inborn	450	45.7
Outborn	535	54.3
Home	292	29.6
Hospital	243	24.7

Table 6 : Of 693 hospital delivery, 198(28.9%) were delivered by NVD, while 495(71.4%) by caesarean.

Mode of delivery At hospital	Frequency	Percentage (%)
NVD	198	28.6
Caesarian	495	71.4

Table 7 : Maternal infections of variable severity 322(32.7%) was the most common antenatal event, followed by difficult delivery (21.1%), PROM (15.2%), pregnancy induced hypertension (8.9%) and so on.

Maternal ante natal events	Frequency	Percentage (%)
Infections	322	32.7
Difficult delivery	208	21.1
PROM	150	15.2
PIH	88	8.9
APH	52	5.2
Diabetes	30	3.1
Toxemia	22	2.3
Rh neg mother	10	01
Uneventful	03	10.5

(PROM-Premature Rupture Membrane, PIH-Pregnancy Induced Hypertension, APH-Antepartum Hemorrhage)

Table 8 : Main causes of admission or morbidity were perinatal asphyxia 398(40.4%), sepsis 164(16.6%), preterm LBW 122 (12.4%), MSB 88 (8.9%), IUGR 80 (8.1%), neonatal jaundice 62 (6.3%), IDM 30 (3.0%) etc.

Diagnosis	Total number	Percentage (%)
PNA	398	40.4
Sepsis	164	16.6
Preterm LBW	122	12.4
MSB	88	8.9
IUGR	80	8.1
Neonatal jaundice	62	6.3
IDM	30	3.0
TTN	15	1.5
MAS	10	1.1
RDS	06	0.6
Congenital anomaly	10	1.1

Table 9 : Of 398 babies with Perinatal Asphyxia (PNA), 70.4% was delivered by vaginal delivery, 49.8% had APGAR 7-9 indicating mild PNA and most of the babies (63.3%) met HIE stage 1 criterion.

PNA parameter	Frequency	Percentage (%)
Deliverymode		
NVD	280	70.4
C/S	118	29.6
APGARScore		
7-9	198	49.8
4-6	155	38.9
0-3	45	11.3
HIEStaging		
Stage1	252	63.3
Stage2	126	31.7
Stage3	20	5.0

(NVD-Normal Vaginal Delivery, HIE-Hypoxic Ischemic Encephalopathy)

Table 10 : Outcome of major neonatal Diseases.

The main factors contributing to neonatal mortality were preterm LBW 08(6.5 %), perinatal asphyxia 18(4.5%), sepsis 04(2.4%), RDS 01(16.7%) and MAS 01(10%). Mortality in LBW was significantly high as compared to normal birth weight group. Most of the patients were referred because of their financial constraints.

Diagnosis	Total number	Discharge with advic	Discharge on request	Referred	Expired
Preterm LBW	122	85 (69.7%)	24 (19.7%)	05 (4.1%)	08 (6.5%)
PNA	398	268 (67.3%)	107 (26.9%)	05 (1.3%)	18 (4.5%)
Sepsis	164	120 (73.2%)	37 (22.6%)	03 (1.8%)	04 (2.4%)
MAS	10	08 (80%)	0 (0%)	01 (10%)	01 (10%)
RDS	06	05 (83.3%)	0 (0%)	0 (0%)	01 (16.7%)

Table 11 : Neonatal mortality rate in the studied centre.

Total neonates	Neonatal mortality Per 1000 birth/year
985	32.5

DISCUSSION

In our study, the admissions of male babies were more than those of females. These may be related to the biological vulnerability of the males to infection. The male preponderance for admissions has been documented in previous studies³. Our study showed that 728(73.9%) patients were admitted within first 24 hours of life. This could be explained because 70.4% of the deliveries took place within the hospital.

Perinatal asphyxia 398(40.4%) is one of the important causes of admission in our study. This may be due to initial home trial before heading to hospital. Resuscitation at birth was conducted in inborn deliveries. Most deaths 18 (4.5%) occurred

due to severe PNA with HIE stage II or III. Begum K & Verma et al have also noted perinatal asphyxia as important contributor to neonatal morbidity & early neonatal mortality^{4,5}.

In this study, sepsis 164 (16.6%) is the 2nd commonest cause of neonatal morbidity and 2.4% of neonatal deaths are due to sepsis. Findings are almost the same in a study from Bangladesh by Chan GJ et al in 2013 which showed that 12.8% of neonatal morbidity was attributed to sepsis⁶. But another two studies from Bangladesh showed that sepsis constituted 12% of neonatal mortality in rural Bangladesh in 2010 and 20% in urban slams in 2012^{7,8}. This difference could be because of early diagnosis & improved patient care at hospitals in our study.

Preterm LBW babies were responsible for 122 (12.4%) of neonatal morbidity and 6.5% of neonatal death. This result is more or less similar to a study carried out by Baqui AH et al from Bangladesh in 2013 where preterm babies constituted 19.4% of neonatal morbidity⁹. But a study carried out by Azad et al showed that 13.3% of death occurred due to preterm babies¹⁰. According to Yasmin S et al, preterm delivery was the most important contributor to the NMR, which correlates with our study¹¹. Deaths are mostly due to the complications associated with prematurity and can be reduced by providing good neonatal & antenatal care¹².

In the present study, meconium stained babies constitute 88 (8.8%) of total neonatal admission. But a study by Balchin I et al found 16.8% in south Asia¹³. In our study, 70 (7.1%) of total admissions were IUGR, having no death. Neonatal jaundice comprised 6.3% of morbidity. But a study from India showed that 20.4% of neonatal admissions were due to jaundice¹⁴. In this study, the other common morbidities were IDM 30 (3.0%), TTN 15 (1.5 %), MAS 10 (1.1 %), RDS 06 (0.6 %) and congenital anomalies 10 (1.1%).

The causes of death in the present study are preterm LBW (6.5%), PNA (4.5%), sepsis (2.4%), RDS (16.7%) and MAS (10%). Apparently, it seems that RDS & MAS are the leading causes of neonatal mortality in this study which does not reflect the true pictures, because the numbers of admitted cases in these two subgroups were very small resulted high mortality mathematically. A large retrospective analysis demonstrated the overall mortality rate for MAS to be 1.2% in the US, but the mortality may be as high as 20% in severe disease¹⁵. Another study showed that antenatal corticosteroid therapy to women at risk of preterm delivery reduces the incidence of RDS morbidity and mortality¹⁶.

LIMITATION

This study has some limitations. As it was a hospital based study, the results of this study may not reflect the true burden which is prevalent in the community as a whole.

RECOMMENDATION

1. Integrated and complementary strategies are needed to address the major causes of morbidity and mortality in Bangladesh. Special attention should be given to health and nutrition of adolescent girls and women of child bearing age before their first pregnancy and between pregnancies, as well as to pregnant women.

2. As antenatal clinic service does not exist in our country, there is need for community-based interventions that are accessible to all. These clinics should provide information about nursing care of newborn, importance of breast feeding, immunization which definitely will have positive implications in reducing morbidity & mortality.

3. We should formulate national & institute based clinical guidelines for the management of pregnancy, mothers with preterm labour or at risk of preterm birth, and those on the care of preterm babies & implementation of preventive measures during perinatal period to avoid perinatal asphyxia & other common neonatal diseases.

4. To develop tools to improve health workers' skills and assess the quality of care at regular intervals. Further, much effort is needed to educate community members about neonatal danger signs and to engage them in effective care-seeking behavior. A complete package of services from pregnancy through the neonatal period must be provided.

CONCLUSION

Preterm LBW, perinatal asphyxia and sepsis are the main causes of admission in our study as are the main causes of mortality. Most of the causes of neonatal morbidity and mortality are preventable. However a lot more effort needs to be put in order to increase the public awareness of importance and regularity of antenatal checkups, increase in birth spacing, improving nutritional and educational status of the mothers and girls, as well as improving neonatal services.

DISCLOSURE

All the authors declared no competing interest.

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