

Original Article

Disease Pattern and Outcome of Newborn Admitted in SCANU of Sheikh Sayera Khatun Medical College & 250 Bed General Hospital, Gopalganj, Bangladesh

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ABSTRACT

Introduction: Neonatal period or the first 28 days of life, is the most vulnerable period of human life as it accounts for a very high morbidities and mortalities, most of which are preventable. Neonatal mortality and morbidity pattern is a sensitive indicator of availability, utilization and effectiveness of maternal and child health services in the community, and are useful in planning for improved healthcare delivery. This study was aimed to see the pattern of neonatal morbidity and its outcome in SCANU (Special Care Newborn Unit) of Sheikh Sayera Khatun Medical College (SSKMC) & 250 Bed General Hospital, Gopalganj. This can help to take preventive measures and initiate a program for better neonatal management to reduce morbidity and mortality. **Methods:** This retrospective analytical study was conducted over one year from Jan-Dec.20 among the newborn admitted in SCANU of SSKMC. **Results:** Among 2169 newborn 1393(64%) were male and 776(36%) female. M:F-1.79:1. Inborn was 258(12%) and out born 1911(88%). Seventy percent (1523) baby delivered by LUCS and 646(30%) by NVD. Most (61%) presented in <24 hours of birth, 32% within 1-7 days and rest later. Preterm low birth weight (LBW) 829 (38%), sepsis 711(32.78%), and perinatal asphyxia 359(16.55%) was predominant diseases for SCANU admission. Most newborn (87.84%) 1905 were discharged from hospital, and 79(3.64%) newborn left against medical advice. Mortality rate was 10.83% (235), and common causes are Sepsis 101(43%), perinatal asphyxia 68(29%) and Preterm LBW with complications 66(28%). **Conclusion:** Preterm LBW, Sepsis, and Perinatal asphyxia were the major causes of our

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neonatal admissions. The mortality rate was higher among the neonates with sepsis, perinatal asphyxia and preterm LBW and its complication. Most of the patients were discharged home after complete recovery.

Key words: Disease pattern, outcome, SCANU, Sepsis, asphyxia

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INTRODUCTION

First 28 days after birth is called the neonatal period, which is further divided in to very early (birth to less than 24 hours), early (birth to less than 07 days) and late neonatal period (more than 7 days to 28 days of life). Neonatal period is the most vulnerable period of human life as it accounts for very high morbidities and mortalities and most of these are preventable^[1, 2]. A Neonatal Intensive Care Unit (NICU) or SCANU (Special care newborn unit) is a specialized section of a hospital in the Newborn unit (NBU) that provides comprehensive and continuous care for neonates who are critically ill and/or preterm with low birth weight (LBW) who can benefit from each treatment; and also Neonatal Intensive Care Units (NICUs)/SCANU are being utilized to care for high-risk neonates^[1, 3].

Neonatal mortality and morbidity pattern is a sensitive indicator of availability, utilization and effectiveness of mother and child health services in the community and also the socioeconomic status of the nation^[4]. These indicators are useful in planning for improved healthcare delivery^[5]. Worldwide about 4 million babies die in the first 4 weeks of life every year^[6]. The majority of neonatal deaths (99%) occur in developing countries. Globally it has been found that the main causes of neonatal death are preterm birth (28%), severe infections (26%) and, asphyxia (23%)^[6]. In Bangladesh neonatal mortality rate is declining less rapidly compared to infant and under 5 mortalities^[6, 7]. The current neonatal mortality rate is 30 deaths per 1,000 live births; it accounts for 67% of all under-5 deaths. The under-5 mortality rate

has declined gradually over the last 2 decades. Between the 2014 BDHS and the 2017-18 BDHS, however, the decline has slowed noticeably. Infant and neonatal mortality have remained stable during this period^[8].

The major newborn killer in Bangladesh are complications of prematurity (31%), birth asphyxia (22%), and severe infection (19%)^[9]. Perinatal and neonatal deaths in developing countries are known to occur primarily because of poor maternal health, adverse social conditions, and inadequate care during pregnancy, delivery, and the immediate postpartum period^[9]. Only 47% of women in Bangladesh, receive proper antenatal care (four or more visits) and 57% of deliveries are attended by medical personal. Half of the mothers and children receive postnatal care from a medically trained provider within 2 days after delivery. Only 7% of newborns who are born outside institutions receive all five recommended essential newborn care practices^[8, 10].

Without a substantial reduction in neonatal deaths, Sustainable Development Goal (SDG) will not be achieved. The government of Bangladesh has developed a national policy of free maternal and child health care which was implemented to improve care for pregnant mothers and children. But the outcome of such care on perinatal morbidity and mortality is yet to be measured. To improve the hospital care of neonates it is imperative to know the disease pattern and their outcomes in the hospital setting. This study was aimed to see the pattern of neonatal admission,

morbidity and its outcome in the SCANU of Sheikh Sayera Khatun Medical College (SSKMC) & 250 Bed General Hospital Gopalganj, which is the attached teaching hospital of SSKMC, a tertiary care medical college hospital in the southern part of Bangladesh. This can help to take preventive measures and initiate a program for better management of neonatal problems to reduce morbidity and mortality.

METHODS & MATERIALS

This retrospective analytical study was conducted targeting all neonates admitted in the SCANU of SSKMC & 250 bed General Hospital, Gopalganj, from January 2020 to December 2020. Data were collected from the medical records stored in the hospital record room and admission and discharge registrar of SCANU. A total of 2169 newborns were admitted during the study period. All data including age and sex, weight & gestational age on admission, place, and mode of delivery, cause of admission, duration of hospital stay, and outcomes (discharge, death, referred or left against medical advice) were documented and recorded in a pretested data collection sheet. Data were analyzed using SPSS-20 computer software for windows. Ethical approval for the study was obtained from the Institutional review board of Sheikh Sayera Khatun Medical College, Gopalganj.

Operational Definitions:

As it is a retrospective study, diagnosis was made by the initial attending physician based on clinical presentation and supportive laboratory results. Standard protocol was followed.

- Prematurity: Neonates delivered before 37 completed weeks from the 1st day of the last menstrual period (LMP) are defined as preterm. For mothers who did not

know the dates of their last normal menstrual period, the new Ballard score was used to estimate the gestational age^[11].

- Low birth weight (LBW): Babies with birth weight <2500gm; termed as low birth weight (LBW)^[12].
- Very Low Birth Weight (VLBW): Babies with birth weight <1500 gm; termed as very low birth weight (VLBW)^[12].
- Extremely Low Birth Weight (ELBW): Babies with <1000 gm of birth weight are termed as extremely low birth weight (ELBW)^[12].
- Early onset Neonatal sepsis (EONS): Neonates who presented with a diagnosis of sepsis (clinical as well as lab evidence) within 72 hours of birth were labeled as EONS.
- Late onset Neonatal sepsis (LONS): Neonates who presented with a diagnosis of sepsis (clinical as well as lab evidence) after 72 hours of birth were labeled as LONS.
- Perinatal asphyxia: A neonate with an Apgar score <7 in the fifth minute and/or was unresponsive to stimuli or convulsion not explained by other causes^[13]. For babies born outside health facilities with unknown Apgar scores, details were obtained from the mother about the neonate: if he/she did not cry immediately after birth; had respiratory distress, floppiness, loss of consciousness, presence of convulsion.
- Neonatal jaundice (NNJ): was diagnosed clinically and by doing a serum bilirubin level.
- Congenital heart disease (CHD) was diagnosed clinically and by

doing CXR and confirmed by echocardiography.

- Hemorrhagic disease of the newborn (HDN) was diagnosed on the clinical ground along with prolonged prothrombin time.
- Diagnosis of Pneumonia (respiratory rate >60/min and chest in-drawing.), meconium aspiration syndrome (MAS), and transient tachypnea of the newborn (TTN) were made based on clinical, and radiological finding.

RESULTS

During 1st January to 31st December, 2020, a total of 2169 patients has been admitted in the SCANU of Sheikh Sayera Khatun Medical College & 250 Bed General Hospital Gopalganj, among them 1393(64%) were male and 776(36%) were female. Male female ratio was 1.79:1. Among them inborn was 258(12%) and out born was 1911(88%). Among the inborn 205 was delivered by cesarean section and 53 were born by normal vaginal delivery. Among the out born 1911 babies 1318 were born by LUCS and 593 were born by NVD. Combined a total of 1523(70%) baby deliver by LUCS and 646(30%) were delivered by NVD.

Table-I: Distribution according to anthropometry (n-2169)

Anthropometry	Number(%)
Gestational age	
>37 completed Weeks	1340 (62%)
Preterm	829 (38%)
Birth weight	
Appropriate for gestational age	1210(55.78%)
Low birth weight (n-956)	956(44.07%)
<2500gm LBW	764 (80%)
VLBW	153 (16%)
ELBW	8(0.83%)
IUGR	31 (3.17%)
Macrosomia	03(0.15)

Most (n-1323, 61%) presented in less than 24 hours of birth, 32% (694) presented within 1-7 days and rest (152, 7%) presented after 07 days up to 28 days. Disease profile found among admitted patients are as bellow.

Table-II: Disease profile of admitted patients

Diseases	Number (%)
Preterm LBW	829 (38%)
Sepsis	711(32.78%)
Neonatal Jaundice	236 (10.88%)
Perinatal Asphyxia(n-359)	359(16.55%)
HIE-I	223(62.12%)
HIE-II	125(34.82%)
HIE-III	11 (3.06%)
Respiratory Distress Syndrome	52(2.39%)
Transient Tachypnea of Newborn	198(9.12%)

Hemorrhagic disease of the newborn	10(0.46%)
Meconium stained baby	32(1.47%)
Infant of Diabetic Mother	44(2%)
Birth Defects	128(5.90%)
Hypothermia	60(2.76%)
Others	83(3.82%)

Single patient have one or more than one diagnosis

Birth defect found were cleft lip and palate, isolated cleft lip, isolated cleft palate, meningomyelocele, meningocele, diaphragmatic hernia, club foot, gastroschisis, trachea-esophageal fistula, undescended testis, Hydrocephalus, vesical extrophy, Pierre robin syndrome, pyloric stenosis, downs syndrome, Hirschsprung Disease, Omphalocele, epispadias, hypospadias. Other disease includes vomiting, cough and cold, meningitis,

pneumonia, meconium aspiration syndrome, hypoglycemia, neonatal seizure disorder, Necrotizing enterocolitis (NEC) and disseminated intravascular coagulation (DIC).

Death was 235 (10.83%), Discharged from hospital 1905(87.84%), LAMA 79(3.64%), Referred to other hospital 185(8.52%). Most of the babies with life threatening surgical condition that requires immediate interventions, also severe RDS that require CPAP or ventilator management were referred.

Table-III: Duration of hospital stay (n-2169)

Days in hospital	Number (%)
<2days	556(25.63%)
2-7days	1036(47.76)
7-14days	542(25.0)
>14days	35(1.61)

Table-IV: Cause of death (n-235)

Disease	Number (%)
Sepsis	101(43%)
Perinatal Asphyxia	68(29%)
Preterm LBW with complications	66(28%)

DISCUSSION

This retrospective analytical study was conducted targeting all neonates admitted in the SCANU of SSKMC & 250 bed General Hospital, Gopalganj, from January 2020 to December 2020. During this period, a total of 2169 patients has been admitted in the SCANU, among them 1393(64.22%) were male and 776 (35.78%) were female. Male female ratio was 1.79:1.

Majority of the admission were male as compared to female. The male predominance, in this study, is also consistent with other studies conducted in Bangladesh, India, Ethiopia and Kenya^[14, 15, 16, 17]. This indicates that male neonates are more vulnerable during the neonatal period; this might be due to higher biological survival rate of girls in the neonatal period^[18]. Additionally, cultural

and social factors could also contribute to male babies getting more attention by parents than females.

Inborn was 258 (12%) and 1911(88%) was out born. Uppal K et al. showed inborn and out born admission rates (69.2% and 30.8%),^[19] which differs from this study. This may be due to the fact that ours is a small hospital with 30 bed in Obstetrics and Gynecology department, which is always overburdened, moreover our SCANU is 10 bedded but has an occupancy rate of 150%. Seventy percent (1523) babies were delivered by LUCS and 646(30%) were delivered by NVD. Sixty-two percent (1340) babies were term and 829 (38%) was preterm.

It was observed in the study, most of the neonates (n-1323, 61%) presented to SCANU in less than 24 hours of birth. The result in this study is consistent with other studies.^[16, 17, 18] This indicates that most of the neonatal problems occur during the first 24 hours of life. It could be because of that the first 24 hours of life is the transitional period from intrauterine to extra uterine life^[18].

Appropriate for gestational age (AGA) was 1210(55.78%) newborn, 956(44.07%) babies were Low birth weight, and only 03(0.15%) were macrosomia. Preterm LBW was 829 (38%), sepsis 711(32.78%), and perinatal asphyxia with various stages of HIE was predominant diseases 359(16.55%) for SCANU admission, followed by neonatal jaundice 236 (10.88%), transient tachypnea of newborn 198(9.12%), birth defects 128(5.90%), respiratory distress Syndrome 52(2.39%), IDM, HDN, meconium stained baby, hypothermia and others. Major causes of admission in our study is almost same with other studies. However, the proportion attributable to each cause varies from center to center. Perinatal asphyxia (28.18%) was

the main cause of admission followed by sepsis (25.12%), neonatal jaundice (20.12%), and preterm low birth weight (17%) were found by Parvin et al^[14] Another study in Bangladesh showed birth asphyxia (37.7%), sepsis (20.5%), preterm low birth weight (19.2%), and respiratory distress (6.2%) were the main causes of NICU admission^[20]. Study done in Srilanka shows that neonatal jaundice (54%), prematurity (13%), birth asphyxia (13%), and infections (6%) were major causes of admission^[21]. Study in Pakistan revealed preterm low birth weight (24%), sepsis (19.9%), respiratory distress syndrome (18.9%), birth asphyxia (17.02%), meconium aspiration syndrome (15.2%), and neonatal jaundice (9.44%) were common causes of admission^[22]. Pre term LBW, sepsis, and perinatal asphyxia were common causes of neonatal morbidity in neonatal care centers of developing countries including ours. This could imply the lack of appropriate interventions in the antenatal, intrapartum and post-partum neonatal care and lack of appropriate health care facilities/services.

In our study 1905(87.84%) newborn was discharged from hospital, and 79(3.64%) newborn left against medical advice (LAMA). Majority 1036(47.76%) newborn stayed in the hospital for 2-7 days, followed by 556(25.63%) stayed <2 days, 542(25.0%) for 7-14days and only 35(1.61%) neonates stayed >14 days. Total 185(8.52%) newborns were referred to other hospital. Cause of referral was babies with life threatening surgical condition that requires immediate interventions, also severe RDS that require CPAP or ventilator management. Our SCANU do not have any CPAP or ventilator.

It is essential to know the outcome of the admissions for evaluating the effectiveness of care provided in a hospital setting. There

is a great variation in neonatal death statistics between NICUs in the different newborn care centers in Bangladesh and also in different parts of the world^[23]. This variation probably reflects the difference in the attending population, antenatal care, admission criteria, specific exclusion and inclusion criteria and level of neonatal care provided. Mortality rate was 10.83% (235) in our study, which is similar to Gerensea H 1606 (9.7%), but higher than Parvin et al 14(1%) and Seboka et al. 19 (4.9%)^[2, 14, 24]. Sepsis 101(43%) was the most common cause of death followed by perinatal asphyxia 68(29%) and Preterm LBW with complications 66(28%). Seboka et al. found sepsis 52.6 % (10) and respiratory distress 26.3% (5) were the predominant cause of death^[24]. Pervin et al found Sepsis 12(63.15%) is the major cause of death followed by PNA 5(26.31%), VLBW 1(5.26%), and surgical cases 1(5.26%) compared to studies conducted in another subcontinent of deaths were more because of sepsis^[14, 17, 25, 26].

CONCLUSION

Preterm LBW, Sepsis, and Perinatal asphyxia were the major causes of our neonatal admissions. The mortality rate was higher among the neonates with sepsis, perinatal asphyxia and preterm LBW and its complication. Most of the patients were discharged home after complete recovery.

RECOMMENDATION

- Implementation of proper infection prevention protocol and appropriate treatment of maternal infection during labor and delivery or after delivery and encourage women to deliver in formal health facilities.
- Providing proper training for health care provider who attends labor and delivery is also very important in timely resuscitation of babies at

birth and early detection and prevention of asphyxia and sepsis during labor and delivery.

- In our study, since the leading causes of neonatal admissions are Preterm LBW, Sepsis, and Perinatal asphyxia. Further extensive studies should be conducted in order to determine the risk factors particularly involved in these problem.

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