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Original Research Article

Admission Pattern and Outcome of Admitted Child in a Private Medical College Hospital of Northern Zone of Bangladesh

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Abstract: ***Background:*** The pattern of child illness speacially neonatal illness varies depending on the location and period. examining the trend of newborn admissions. Being a low- and middle-income nation (LMIC), Bangladesh, understanding hospital admission patterns and post-care outcomes is crucial for a child's survival. In addition, Bangladesh has difficulty keeping up with and achieving the Sustainable Development Goal (SDG) in terms of newborn deaths and child mortality. ***Objective:*** This study's goal was to learn more about hospitalised patients' admission trends and treatment outcomes. ***Methods and Materials:*** The present retrospective study was carried out within the Department of Pediatrics at Prime Medical College Hospital in Rangpur, Bangladesh, spanning from January 2016 to November 2016. This study included a cohort of 1053 who were admitted at Prime Medical College Hospital. The cohort consisted of both inborn and outborn neonates throughout the specified period. ***Results:*** The most prevalent complications observed were perinatal asphyxia with hypoxic-ischemic encephalopathy (HIE) accounting for 24.8% (n=109), preterm low-birth-weight newborns comprising 34.2% (n=150), and neonatal septicemia representing 16.6% (n=73). The prevalence rates of Meconium Aspiration Syndrome and Neonatal Jaundice were found to be 3.4% and 5.7%, respectively. The leading cause of death were perinatal asphyxia accompanied with hypoxic-ischemic encephalopathy 19, which accounts for 50% of the total death, followed by preterm low birth 39.5%.The causes children admission in the hospital and highest cause of the admission is Respiratory system 30% (n=614) and Gastrointestinal (GI) tract 22.5% (n=614) and major cause of the child death 41.7% (n=12) and Nutritional disorder 25%. Though 97% of the patients have shown improvement in their health conditions and were subsequently discharged, while 1.95% unfortunately succumbed to mortality. ***Conclusion:*** The leading causes of neonatal hospitalizations, according to the investigation, were neonatal infection, GI tract, respiratory system, and preterm low birth weight. The causes of mortality were found to be prenatal hypoxia and neonatal infection. Variations in death rates can reveal information about the effectiveness and quality of healthcare services.

Keywords: Admission patterns, neonatal infections, preterm low birth weight, respiratory system.

INTRODUCTION

Globally, adults aged 5 to 24 have a lower risk of dying than children under the age of 5, still, an estimated 2.1 million children and youth in this age group died in 2021 alone—43 per cent of those deaths occurred in the adolescent period, ages 10-19 and the probability of children aging 5-24 years in South Asia was 13.5 deaths per 1,000 children aged 5 years in 2021. Neonatal morality is another cause of child mortality contributing to the 40% of under-five mortality rates worldwide are in the United States, contributing to overall under-five death rates. Every year, 2.4 million children worldwide die soon after delivery, with developing nations accounting for 36% of these deaths. The neonatal period (birth to the first 28

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days) continues to be the time when children are most at danger of dying, according to the Global Health Observatory of the World Health Organization (WHO), as it accounted for almost 47% of all under-five deaths in 2013 [1]. According to the latest BDHS report two-thirds of deaths in children under the age of five are caused by neonatal causes, and variations in the under-5 mortality rate are largely dependent on changes in the death rate in the first month of life [2]. The hospital's disease pattern serves as a crucial identifier for diagnosis. A sensitive measure of the accessibility, use, and efficacy of mother and child health services in the community is the disease pattern in care units. The pattern of disease varies between locations, and occasionally even within the same location [3, 4]. Most of the causes for the children being admitted in the hospital are often preventable through proper treatment and care and majority of the causes are due to intrapartum asphyxia, infection [5], birth asphyxia, and congenital [6] in neonates and pneumonia, sepsis, meningitis, enteric fever etc [7]. The pattern of disease varies between locations, and occasionally even within the same location. Considering the factors associated with child mortality, ending unnecessary child mortality is an urgent global priority that must be addressed as part of the Global Strategy for Women's, Children's, and Adolescent Health (2016-2030) [8]. Bangladesh being a low middle income country (LMIC), recognition of admission patter and post care outcome in the hospital is very important for survival of child. Besides, Bangladesh faces a problem in maintaining pace and meeting the Sustainable Development Goal (SDG) regarding the neonatal deaths and child mortality [9]. This study assessed the pattern of admission and outcomes at private medical college hospitals.

OBJECTIVE

The objective of this study was to ascertain the admission patterns and outcomes of patients who were hospitalized to the hospital.

METHODS AND MATERIALS

This was hospital-based retrospective survey which involved review of admission register and the records of 1053 patients including newborns and children aging up to 18 years admitted between January 2016 to November 2016. Both outborn and inborn babies were included in the study and patient aging above 18 years were excluded from the study.

This study was done at Prime Medical College Hospital, in Rangpur, Bangladesh. It is a 750+ bed unit. Data of all neonates admitted into the neonatal unit were collected from the admission, discharge and death registers using a pretested structured questionnaire prepared in English.

Data Collection and Analysis

The admission, discharge, and death registries were used to compile information on every child who was admitted to the ward. This was accomplished by using a structured questionnaire that had been written in English and had undergone prior testing. The information that was extracted covered a wide range of factors, including the gestational age, gender, weight at birth and admission, gestational age, mode of delivery, and location, history of birth asphyxia, primary final diagnosis, date of discharge, and outcomes (including discharge, death, or leaving against medical advice), as well as the cause of death. The data were subjected to statistical analysis using accepted practices. The SPSS version 23 for Windows software, created by SPSS Inc., a company based in Chicago, Illinois, USA, was used for the data collection and analysis in this work. Because this study used a descriptive research approach, calculating percentages and frequencies was part of the analysis. The hospital's ethics committee gave the study their blessing.

RESULTS

Table 1: Demographic Characteristics of the admitted children

Age Group	Admission n(%)	Death, n (%)	% of death
Neonate (birth – 28 days)	439 (41.6)	38(76)	8.65
General (29 days – 18 years)	614 (58.3)	12 (	1.95
Total, N	**1053**	**50**	**4.74**

Table 1 shows the total number of patients admitted in the hospital was 1053 where the number of neonate admitted to hospital during the study period was 439 which consist around 41% of the total sample and general patients were 614 consisting 58% of the total admitted patients during the study period.

Figure 1 shows the percentage of the referral area all over the Bangladesh. According to this data Rangpur has the most referral patient which is about 53 percentage of total admitted patients. Other referral areas include Thakurgaon (1%), Panchagar (1%), Gaibandha (13%), Dinajpur (9%), Nilphamari (6%), Lalmonirhat (6%), Kurigram (11%).

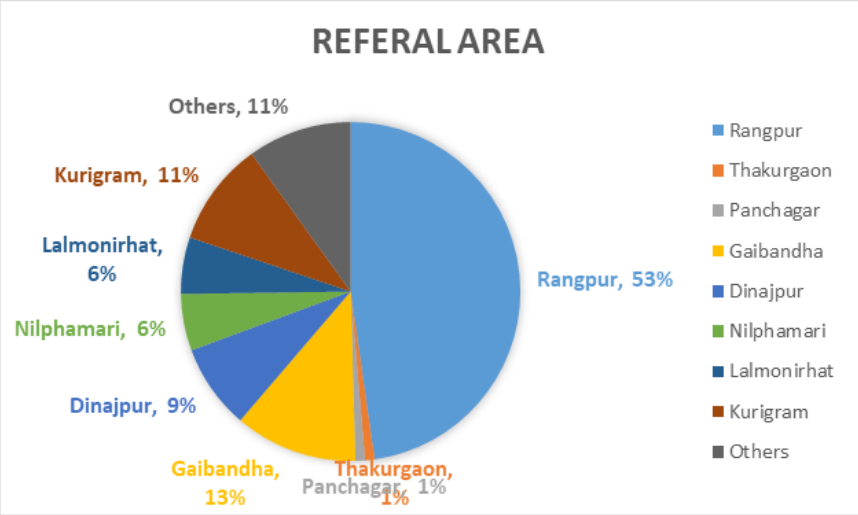

Figure 1: Admission according to referral area.

Table 2: Disease pattern of the neonatal admissions

Name of disease	No. of admission, n (%)	No. of death n (%)
Perinatal asphyxia with HIE	109 (24.8)	19 (50)
Septicemia	73 (16.6)	3 (7.9)
PLBW babies	150 (34.2)	15 (39.5)
IUGR	5 (1.1)	Nill
Jaundice	25 (5.7)	Nill
Acute respiratory distress syndrome (ARDS)	4 (0.9)	1 (2.6)
Meconium aspiration syndrome	15 (3.4)	Nill
Infant of diabetes mellitus	16 (3.6)	Nill
Hydrocephalus	1 (0.2)	Nill
Cyanotic heart disease	4 (0.9)	Nill
Baby of Rh (-) mother	2 (0.5)	Nill
Congenital anomalies	9 (2.1)	Nill
Baby for observation	26	Nill
Total, N	**439**	**38**

Table 2 shows the diagnosis of neonatal cases admitted to the hospital. The most common causes of the patients being admitted to the hospital Pre term low birth weight babies about 34.2 % (n=439) and Perinatal asphyxia with HIE 24.8% (n=439) and it is also the most common of neonatal death 50% (n=38). Other admission causes include Septicemia Intrauterine growth restriction (IUGR), Jaundice, Acute respiratory distress syndrome (ARDS), Meconium aspiration syndrome, Diabetes mellitus, Hydrocephalus, Cyanotic heart disease, Congenital anomalies and Baby of Rh (-) mother.

Table 3: Disease profile of children

Diagnosis	No. of children N (%)	Death N (%)
Respiratory system	187 (30)	1 (8.3)
Infectious disease	82 (13.4)	5 (41.7)
CNS disease	51(8.3)	2 (16.7)
Urinary system	28 (4.6)	Nil
Haematological system	45 (7.3)	Nil
Cardiovascular system	4 (0.7)	Nil
Gastrointestinal (GI) tract	138 (22.5)	1 (8.3)
Psychiatric disorder	8 (1.3)	Nil
Nutritional disorder	15 (2.4)	3 (25)
Poisoning	13 (2.1)	Nil
Others	43 (7)	Nil
Total	**614**	**12**

Table 3 shows the causes children admission in the hospital and highest cause of the admission is Respiratory system 30% (n=614) and Gastrointestinal (GI) tract 22.5% (n=614) and major cause of the child death 41.7% (n=12) and Nutritional disorder 25%. Though 97% of the patients have shown improvement in their health conditions and were subsequently discharged, while 1.95% unfortunately succumbed to mortality.

Table 4: Major Causes of Neonatal Death (n=36)

Name of disease	Frequency	Percentage
Perinatal asphyxia with HIE	19	50.00%
Neonatal septicemia	03	7.89%
PLBW babies	15	39.47%
ARDS	01	2.63%
Total	**36**	**100%**

The Perinatal asphyxia with HIE had the greatest case fatality rate 50% followed by PLBW babies 39.47% (Table 4).

Table 5: Case Fatality rate

Name of disease	Frequency	Percentage
Perinatal asphyxia with HIE (n=109)	19	17.43%
Neonatal septicemia (n=73)	03	4.11%
PLBW babies (n=150)	15	14.29%
ARDS (n=4)	01	25.00%
Meconium aspriration syndrome (n=32)	01	3.13%
Respiratory system (n=187)	01	0.53%
Infectious disease (n=5)	05	100.00%
CNS disease (n=51)	02	3.92%
GIT (n=138)	01	0.72%
Nutritional disorder (n=15)	03	20.00%
Acute watery diarrhea (n =124)	01	0.81%
Pneumonia (n=135)	01	0.74%
Total	**36**	**7.48%**

Infectious disease (n=5) has the highest case fatality rate about 100% and GIT (n=138) has the lowest case fatality rate among the all cases.

DISCUSSION

The most frequent neonatal morbidity in the study was birth asphyxia, which was followed by low birthweight/prematurity and sepsis. This is in line with discoveries other research from Pakistan, Nigeria, India, and Tanzania, where birth asphyxia was listed as the most typical reason for hospital admissions while the percentage it accounts for varies from every study. Our study found 24.8% of admission was due to birth asphyxia compared to 24%, 32%,31%,16% and 27% in other studies in Pakistan, Nigeria, Indian and Tanzania respectively [10–12]. However, preterm and low birth weight were the most frequent morbidities in the majority of studies on neonatal admission to the NICU (neonatal intensive care unit) [13–15], whereas sepsis was also mentioned as the most frequent morbidity in a small number of studies [13, 16]. This variation in admission reasons between studies is probably an indication of the quality of maternal and newborn care services provided by lower-level health systems, which has an impact on patient management, cases that are ultimately referred, referral systems, and other socioeconomic factors. Sepsis (16.6%), pneumonia (19.2%), and meningitis (15.4%) were the main causes of infections. The issue of neonatal sepsis is universal and beyond borders. The incidence of newborn sepsis differs across developed and developing nations because higher prevalence rates are noted in emerging nations [17].

Birth asphyxia affected 24.8% of newborns in this study, 12% in a study in DSH, 16.52% in Peshawar [18, 19], and 13% of neonates in a study in Pakistan [20]. The absence of antenatal care, low nutritional status, antepartum hemorrhage, maternal toxemia, and home delivery are among the major risk factors for birth asphyxia described from a study done in Hyderabad, India [19].

Additional reasons for admission included Neonatal Jaundice (5.7%), Acute respiratory distress syndrome (ARDS) (0.9%), Infant of Diabetes MMeconium Aspiration Syndrome (15, 3.4%), and Multiple Congenital Malformation (9,2.1%). Other studies in Bangladesh and Nigeria (30.71% and 17.25%, respectively) have found higher rates of jaundice in newborns [21]. However, in our hospital, the percentage is minimal due to the availability of

phototherapy in the ward and cabin for newborns with normal vital signs.

Prematurity, infection, and prenatal asphyxia were often the most common causes of admission to our hospitals. Studies carried out in other developing nations have produced comparable results.

CONCLUSION

In our investigation, it was observed that neonatal infection, birth asphyxia, and preterm low birth weight (PLBW) were the primary factors leading to neonatal hospitalizations. Additionally, prematurity and perinatal asphyxia resulting in hypoxia ischemic encephalopathy were identified as the primary causes of mortality among neonates. The significance of death rate variations is in their ability to provide valuable conclusions regarding the quality of healthcare and offer valuable insights towards enhancing the effectiveness and efficiency of care delivery.

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