

Outcomes and Frequency of Neonatal Diseases Observed in the Neonatal ICU of the Paediatric Department of a Tertiary Care Hospital

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ABSTRACT

Objective: The present study aims at assessing the frequency of diseases in neonates that have to be admitted to the neonatal intensive care unit and the outcomes of those diseases

Study design: A cross-sectional study

Place and Duration: This study was conducted at Kulsumbai Valika Social Security Site Hospital Karachi from November 2021 to November 2022.

Methodology: All the neonates that presented to NICU (Neonatal Intensive Care Unit), were included in the study. Demographic data related to all the patients were collected, such as gestational age, gender, weight at the time of admission, and date of admission. Clinical data that was collected included diagnosis at the time of admission, final diagnosis, referral, mortality within four weeks of the total life of the patient, and discharge date. The mode of admission, either in outpatient or emergency, was also noted.

Results: A total of 210 patients were added to the present study. Overall 90 (42.86%) patients were admitted in the first six hours of life. The main reason for admission was neonatal sepsis in 57 (27.14%) patients. Other reasons included prematurity in 52 (24.76%) patients, neonatal jaundice in 25 (11.9%) patients, birth asphyxia in 15 (7.14%) patients, IUGR (intrauterine growth restriction) in 14 (6.66%) patients, respiratory distress syndrome in 11 (5.23%), meconium aspiration syndrome in 12 (5.7%) patients, and the remaining 24 patients had other health issues. A total of 182 (86.67%) patients were discharged from the hospital in stable condition, while 8 (3.8%) were referred to a more advanced healthcare facility. Overall 11 (5.2%) patients died in the hospital and 9 (4.28%) left against medical advice (LAMA).

Conclusion: Prematurity and neonatal sepsis are the main causes of neonatal admissions in Neonatal ICU. These causes are followed by Birth Asphyxia and Neonatal Jaundice.

Keywords: Neonate, Neonatal ICU, Admission, Birth Asphyxia, Neonatal Sepsis, Prematurity, Neonatal jaundice

INTRODUCTION

Most mortalities under the age of 5 years happen in the neonatal period of childhood [1]. This is the reason that neonatology is a completely separate sub-specialty of pediatrics [2]. To decrease the rate of mortality and morbidity in children under the age of 5 years, most of the prevention and rescue strategies should be applied to the neonatal stage. Most of the diseases in the neonatal stage are preventable [3]. However, the patterns of the diseases seem to be changing with the passage of time and advancement in interventions and research [4]. Neonatal mortality and morbidity are considered an indicator of the efficiency and effectiveness of healthcare services as well as the socioeconomic status of a country [5]. In Pakistan, which is a developing country, neonatal health is one of the major concerns because of the shortage of resources, poor socioeconomic and awareness in masses [6].

A total of 4 million out of 130 million births result in the mortality of neonates [7]. Overall 50% of infants die in their neonatal period in Pakistan with a rate of mortality of 57/1000 [6]. The leading cause of the diseases in neonates that lead to admission, should be investigated and brought under concern. This can control the rate of mortality [8].

The present study was conducted to find out the major reasons for neonatal admissions and also to look for the leading reasons for mortality so that preventive measures can be observed. Preventive measures can minimize the rate of mortality and morbidity. The present study can highlight the main diseases and common diseases along with their patterns which can help in focusing a load of diseases in NICU. It can help in making strategies to utilize limited resources in a smarter way to make policies.

METHODOLOGY

The present study is a cross-sectional observational study that included a total of 210 neonates. The patients were admitted

through the outpatient department or emergency department. The sick patients that were born in the hospital, were also included in the study. According to the inclusion and exclusion criteria of the study, sick neonatal patients with expected surgical illnesses or surgical emergencies were not included in the study.

The data which was collected at the time of admission in the hospital included the age of the patient in weeks, gender, admission date, the weight of the patient in kilograms, outcome of the disease or confirmed diagnosis, LAMA patients, referred patients, discharge after improvement of the condition, mortality within four weeks and discharge date. A proforma was filled that included all the mentioned information. The main diagnosis was made based on clinical symptoms and the diagnosis was confirmed by radiological and laboratory findings. The diagnosis of neonatal sepsis was made by the observation of the symptoms, C reactive protein (CRP), and total leukocyte count (TLC) and confirmed by performing a blood culture test.

Birth asphyxia was diagnosed by clinical signs such as late crying after birth or weaker respiratory efforts. Neonatal jaundice was diagnosed by serum bilirubin level. Radiological findings were considered significant in making the diagnosis of meconium aspiration syndrome. Congenital heart disease was diagnosed by chest X-ray and echocardiography. The data was collected carefully and analyzed by using IBM SPSS version 26.

RESULTS

Out of 210 neonates, 117 (55.7%) patients were female and 93 (44.28%) were male. The range of weight was from 750 mg to 3.9kg. The demographic data of the patients has been shown in table 1. Overall 90 (42.86%) patients were admitted in the first six hours of birth. The main reason for which the patients admit was neonatal sepsis. A total of 57 (27.14%) patients were admitted for neonatal sepsis. Other reasons were prematurity 52 (24.76%), neonatal jaundice 25 (11.9%), birth asphyxia 15 (7.14%), IUGR 14 (6.66%), meconium aspiration syndrome 12 (5.7%), and

respiratory distress syndrome 11 (5.23%). Other less common reasons were transient tachypnea of the newborn (TTN), infant of diabetic mother (IDM), neural tube defects, congenital heart diseases, and congenital anomalies. All the causes of neonatal mortality have been mentioned in table 2.

Table 1: Birth weight and gender distribution of patients (N=210)

Variables	Attributes	Frequency (Percentage)
Gender	Male	93 (44.28%)
	Female	117 (55.7%)
Birth weight in kg	<1	7 (3.33%)
	1-2.5	59 (28.09%)
	2.6-3.5	138 (65.71%)
	>3.5	6 (2.86%)

The majority of patients were discharged from the hospital in stable condition. The major causes of mortality were meconium aspiration syndrome and respiratory distress syndrome. The causes according to percentage have been shown in table 3.

A total of 182 (86.67%) patients were discharged from the hospital in stable condition, while 8 (3.8%) were referred to a more

Table 3: Frequency of neonatal diseases outcomes (n=210)

Diseases	Frequency	Discharge	Referred	LAMA	Death
Neonatal Sepsis	57	48 (84.21%)	4 (7.02%)	2 (3.5%)	3 (5.26%)
Prematurity	52	47 (90.38%)	0	2 (3.84%)	3 (5.77%)
Birth Asphyxia	15	11 (73.33%)	0	3 (20%)	1 (6.67%)
Neonatal Jaundice	25	24 (96%)	0	0	1 (4%)
IUGR	14	14 (100%)	0	0	0
Meconium aspiration syndrome	12	9 (75%)	0	1 (8.33%)	2 (16.67%)
TTN	7	7 (100%)	0	0	0
Respiratory distress syndrome	11	9 (81.81%)	2 (18.18%)	0	0
IDM	5	4 (80%)	0	1 (20%)	0
Neural tube defects	3	2 (66.66%)	1 (33.33%)	0	0
Congenital anomalies	3	2 (66.66%)	0	0	1 (3.33%)
Diarrhea	3	3 (100%)	0	0	0
Arthrogryposis	1	1 (100%)	0	0	0
Congenital heart defects	2	1 (50%)	1 (50%)	0	0

DISCUSSION

The present study includes 210 patients that were admitted to the NICU for different diseases. The study discusses the different outcomes of the diseases. Khan et al conducted a study to observe the spectrum of neonatal diseases and their outcomes in the patients admitted to the NICU. The goal of their study is similar to the present study. They included 284 patients in their study and the majority of the patients were male. Most of the patients had low birth weight. They observed and concluded that the most common cause of neonatal admissions in NICU was Neonatal sepsis followed by prematurity. These results are comparable to the results of the present study. They also suggested a massive improvement in the healthcare facilities of Pakistan [9]. Demisse et al conducted a similar study in Ethiopia which is also a developing country like Pakistan. They included 769 patients in their study which were admitted to the NICU. They observed that the most common reason for admission was hyperthermia, sepsis, and prematurity [10]. These results are somewhat agreeing with the results of the present study.

Mohammed et al conducted a study to observe the neonatal admissions in NICU along with the causative factors. They also focused on the maternal causes of the admissions. They found that the advanced age of the mother and premature birth of the children are highly associated with NICU admissions. Diabetic mothers, a mother with pre-eclampsia, and multiple pregnancies are also risk factors [11].

Sina et al conducted a study in which they included patients admitted to NICU in a tertiary care hospital in Karachi. They included 4107 cases admitted to NICU. They observed that the most common cause of admission was low birth weight and prematurity followed by sepsis [12]. These findings are different from the findings of the present study in terms of the leading cause which was sepsis as per the present study. Other causes, such as

advanced healthcare facility. Overall 11 (5.2%) patients died in the hospital and 9 (4.28%) left against medical advice (LAMA).

Table 2: Frequency of neonatal diseases (n=210)

Diseases	Frequency	Percentage
Neonatal Sepsis	57	27.14
Prematurity	52	24.76
Birth Asphyxia	15	7.14
Neonatal Jaundice	25	11.9
IUGR	14	6.66
Meconium aspiration syndrome	12	5.7
TTN	7	3.33
Respiratory distress syndrome	11	5.23
IDM	5	2.38
Neural tube defects	3	1.43
Congenital anomalies	3	1.43
Diarrhea	3	1.43
Arthrogryposis	1	0.48
Congenital heart defects	2	0.95

birth asphyxia, respiratory distress, and congenital anomalies, had a similar percentage as the present study. Rasheed et al described that babies with low birth weight and preterm babies are more prone to mortality [13]

CONCLUSION

Neonatal sepsis is the leading cause of morbidity and mortality of neonates and neonatal admissions in the NICU. The other common causes are prematurity, neonatal jaundice, birth asphyxia, and IUGR.

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