Frequency and Outcome of Neonatal Diseases in Neonatal Intensive Care Unit at Tertiary Care Hospital Islamabad.

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ABSTRACT

OBJECTIVE: To asses the frequency of neonatal diseases on admission and their outcome.

STUDY DESIGN: A Cross sectional observational study

PLACE AND DURATION: In the neonatal nursery of Rawal Institute of Health Sciences Islamabad over a period of 8 months from 1st May 2015 to 31st December 2015.

METHODOLOGY: All neonates presented to NICU (Neonatal Intensive Care Unit) were enrolled. Data including, gestational age, sex, age, date of admission, weight on admission, diagnosis on admission, outcome or final diagnosis as discharge on request or left against medical advice (LAMA), referral, discharge in improved condition, or mortality within 4 weeks of life and date of discharge was collected for all neonates from admissions forms who were admitted either through emergency or outpatient.

RESULTS: Among a total of 229 neonates 43.7% were admitted within first 6hrs of life. Neonatal sepsis 27.5 % was main reason for admission. Other causes included prematurity 25 %, neonatal jaundice 12.7% and birth asphyxia 7% Intrauterine growth restriction accounts 6.6%, 5.2% were with respiratory distress syndrome and meconium aspiration syndrome, 87.8 % were discharged in stable condition, 4% were referred, 3% left against medical advice and the mortality rate was 5.2%.

CONCLUSION: Neonatal sepsis and Prematurity were found to be main causes of admissions followed by Neonatal Jaundice and Birth Asphyxia.

KEYWORDS: Neonate, Admission, Neonatal Intensive Care Unit, Neonatal Sepsis, Birth Asphyxia, Neonatal Jaundice, Prematurity.

INTRODUCTION

Neonatology is core subspecialty of pediatrics.[1] Neonatal period contributes major percentage to under 5 years age mortality. To reduce the morbidity and mortality in less than 5 years of age

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neonatal period is the main time to put major preventive and rescue strategies. Majority of the diseases in neonates are preventable. Pattern of neonatal diseases changes over time with advancements in research, inventions and interventions[2]. Main indicator of effectiveness and efficiency of healthcare services and socioeconomic status of the country is neonatal morbidity and mortality.[3] In developing countries like Pakistan it is the main area of concern due to shortage of resources, awareness and poor socioeconomic conditions.

Out of 130 million live births worldwide yearly [4] neonatal mortality is almost 4 million. In Pakistan 50% of the infants die in neonatal period.[5] Mortality rate in neonates in Pakistan is 57/1000 of live births that is about 57% in less than 5 years mortality reported in UNICEF data 2014. Scanty data is available and known about diseases in neonates, their mortality and morbidity in Pakistan[6]. To lessen morbidity and mortality of neonates in low economic conditions and with limited resources we must be aware of the leading causes in neonates requiring admissions in neonatal intensive care unit.

This study was carried out to find major reasons for admission plus to know the leading causes of neonatal mortality to adopt preventive measures which could help to minimize morbidity and mortality during this sensitive time. This study may highlight common and main disease patterns of neonates which in turn may help us to focus the disease load in NICU with limited

resources and economy and may help in formatting standard policies for NICU. That will eventually lower the neonatal morbidity and mortality. This study was conducted to assess the frequency of pattern of neonatal admissions and their outcome.

METHODOLOGY

This cross sectional observational study was carried in neonatal nursery of Rawal Institute of Health Sciences (RIHS) Islamabad over a period 08 months from 1st May 2015 to 31st December 2015 after ethical committee approval. All neonates admitted to NICU either through ER or OPD or sick babies those were born inside hospital were enrolled. Neonates were excluded with expected surgical emergencies /surgical illnesses.

Data collected on admission including gestational age in weeks, age, sex, date of admission, weight in kg, diagnosis, outcome or final diagnosis as discharge on request or left against medical advice (LAMA), referral, discharge in improved condition, or mortality within 4 weeks of life and date of discharge. All data was entered in prepared proforma from admission papers. Main Diagnosis was based on clinical basis and was confirmed by relevant laboratory or radiological evidences.

Operational Definitions: Neonate is from birth till 28 days of life[7]. LBW is neonate of <2.5 kg of birth weight ; < 1.5 Kg of birth weight is very low birth weight (VLBW) and < 1kg of birth weight is defined as extremely low birth weight (ELBW).[7] IUGR is a neonate born with birth weight less than 10th percentile according to respective gestational age. Prematurity is a birth prior to 37 weeks of gestation.

Sepsis was diagnosed by observing clinical symptoms and signs aided by C reactive protein (CRP) and total leukocyte count (TLC) and confirmed by blood culture.

Diagnosis of Birth asphyxia was based on crying late at birth or weak respiratory effort on birth with evidence of brain, lungs, kidney ischemic damage followed by confirmatory specific labs. Serum bilirubin level was done in cases of Neonatal jaundice (NNJ) ,that level was plotted on reference range graphs respective to gestational age, weight and age of baby. Diagnosis of Transient tachypnea of newborn (TTN) and Meconium aspiration syndrome was made on the basis of clinical signs and symptoms followed by radiology. Congenital heart disease diagnosis was based on clinical findings, supported by radiology i.e. CXR and confirmed by echocardiography. Neural tube defects/ congenital malformations were diagnosed on clinical grounds followed by confirmation with relevant radiology and specific investigations.

Data Analysis: SPSS version 20 was used for data analyses. Frequencies and percentages were calculated for quantitative data and qualitative data was analyzed in the form of outcome.

RESULTS

Out of 229 neonates, 128 (56%) were females, 101 (44%) were males. Weight was range from 750gm to 3.8 kg (Table I). Within first 6hrs of their life, 100 (43.7%) neonates were admitted (Fig 1). Main reasons for admission were Neonatal sepsis 63 (27.5 %), prematurity 57 (25 %), neonatal jaundice 29 (12.7%) followed by

birth asphyxia 16(7%). Other causes for admission were intrauterine growth restriction (IUGR) 15 (6.6%), meconium aspiration syndrome (MAS) and respiratory distress syndrome (RDS) accounts for 12 (5.2%).Less common reasons for admissions were transient tachypnea of newborn (TTN) 8 (3.5%) ,infant of diabetic mother (IDM) 5 (2.2%), congenital anomalies and neural tube defects 3(1.3%) and congenital heart disease 2 (0.8%)(Table II). Majority of patients were discharged in stable condition in every illness with maximum mortality in cases of congenital anomalies 66.7% followed by meconium aspiration syndrome (16.7%) and RDS 8.3% (Table III).

Overall 201 (87.8 %) patients were discharged in stable condition, 9 (4%) were referred, 7 (3%) left against medical advice (LAMA) and mortality rate was 12 (5.2%).

Table-I: Frequency of gender and birth weight on admission (N=229)

Variables	Attributes	Frequency (%)
Gender	Male	101 (44%)
	Female	128 (56%)
Birth weight (Kg)	<1	6 (2.6%)
	1-1.5	15 (6.5%)
	1.6-2.5	50 (22%)
	2.6-3	78 (34%)
	3.1- 3.5	77 (33.6%)
	>3.5	3 (1.3%)

Table-II: Frequency of diseases in neonates (N=229)

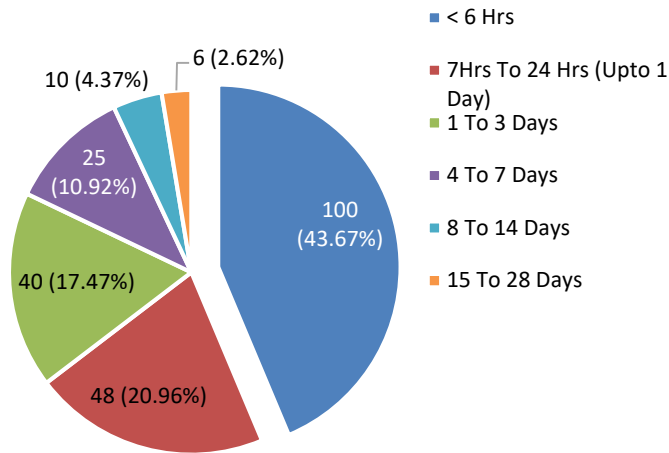| DISEASES	FREQUENCY (%)
Neonatal Sepsis	63 (27.5%)
Prematurity	57 (25%)
Neonatal Jaundice	29 (12.7%)
Birth Asphyxia	16 (7%)
Intrauterine Growth Restriction	15 (6.6%)
Meconium Aspiration Syndrome	12 (5.2%)
Respiratory Distress Syndrome	12 (5.2%)
Transient Tachypnoea Of Newborn	8 (3.5%)
Infant of Diabetic Mother	5 (2.2%)
Congenital Anomalies	3 (1.3%)
Neural Tube Defects	3 (1.3%)
Diarrhea	3 (1.3%)
Congenital Heart Defects	2 (0.8%)
Arthrogryposis	1 (0.4%)

Figure-1: Age distribution on admission (N=229)

Table-III: Frequency of disease outcome (N=229)

Diseases	Number	Discharged	LAMA	Referred	Death
NN Sepsis	63	55(87.3%)	2(3.1%)	3(4.8%)	3(4.8%)
Prematurity	57	51(89.4%)	3(5.3%)	0	3(5.3%)
NN Jaundice	29	27(93%)	2(7%)	0	0
Birth Asphyxia	16	15(93.8%)	0	0	1(6.2%)
Meconium aspiration syndrome	12	10(83.3%)	0	0	2(16.7%)
RDS	12	10(83.3%)		1(8.3%)	1(8.3%)
IUGR	15	15(100%)	0	0	0
Transient tachypnea of newborn	8	8(100%)	0	0	0
Infant of diabetic mother	5	5(100%)	0	0	0
Diarrhea	3	3(100%)	0	0	0
Neural tube defect	3	0	0	3(100%)	0
Congenital anomalies	3	1(33.3%)	0	0	2(66.7%)
Congenital heart defects	2	0	0	2(100%)	0
Arthrogyposis	1	1(100%)	0	0	0

DISCUSSION

During first 24 hours of life 64.7% of newborns were admitted according to this study which is more than other studies done in Pakistan, study in Larkana [7]showed 44.5% , 35% in Peshawar[8] and in Karachi showed 33.6% [9]. But this frequency was less than the study conducted in Lahore, which showed 75% of neonatal admissions within 24 hours of life.[10] That study also revealed female predominance , which is contrary to above mentioned studies[7,8,9]. Pakistan's cultural and social influences justified the Male predominance in above mentioned studies where male gender is being given priority for all kind of care and facilitations.

In many developing countries LBW was found the main reason for neonatal admissions in different studies.[11] In our study, LBW was responsible for 22% of neonatal admissions ; this can be compared to 36% in Larkana,[7]39% in Lahore,[10] 41.2% in Peshawar [8]and 55.4% in Karachi[9]. LBW incidence in Pakistan is higher in comparison to other developing countries; like LBW was 11% in an Ethiopian study, [12] 13.2% in a Bangladeshi study[13]and 20% in a study conducted in India.[14,15] Multiple factors, are involved in higher incidence of LBW in Pakistan including poor and below average socioeconomic conditions of persons which causes low and below standard nutritional status of mothers, high illiteracy rate, inadequate and inappropriate facilities and poor antenatal care and follow up.

This study showed that the Neonatal sepsis was the main reason for neonates requiring admission i.e. 27.5%, as compared to 45.2% in Karachi [9] and 28.7% reported in Peshawar[8.] Unhygienic conditions and unsterilized delivery practices are main reasons for neonatal infections.[11]Neonatal sepsis remains a major contributor to neonatal mortality and morbidity in Pakistan. It is also a major factor of neonatal deaths in developing countries accounts for 15% of all neonatal mortality.[16]this study also showed Acute gastroenteritis in 1.3 % of the cases.

Premature delivery rate is higher in developing countries[17], it is 5% to 7% of live births in some developed countries. Our study showed prematurity accounts for 25% of cases. This rate was quite high as compared to results shown in Karachi[9] i.e. 6.8%.

Hyperbilirubinemia in neonates is a common problem.[18] Most of neonates are home delivered in developing countries so actual data regarding the incidence and prevalence of Neonatal jaundice is lacking. Data is mainly from intensive care nurseries or tertiary care, which cannot be, generalized.[19] Our study showed Neonatal jaundice was responsible for 12.7% of admission, as compared to 8.3% in Lahore. [10] 15% in Karachi[9] and 20% in study done in Peshawar[8]. Other developing countries showed much higher rate of neonatal jaundice, such as Nigeria and Bangladesh (17.2%, and 30.7% respectively).[20, 21]

Birth asphyxia was responsible for 7% cases in this study as compared to 40.7% in Lahore[10], 18.8% in the study at Karachi [9] and 16.5% in the study done in Peshawar [8].Study conducted in Hyderabad India highlighted the main risk factors for birth asphyxia i.e poor nutritional status, maternal anemia ,lack of antenatal care, home deliveries ,placental insufficiency, maternal toxemia and antepartum hemorrhage.[22] Monitoring of high-risk pregnancies antenatally, improving maternal health levels ,referral appropriately , prompt neonatal resuscitation at birth are keys to lessen the higher morbidities and mortalities associated with birth asphyxia.

This study revealed 5.2% neonatal mortality rate. That is much low as compared to other areas ,i.e. 38% in Larkana[7] ,34% in Lahore [10] ,25.8% in Karachi , [9] and 14.9% [8] in the Peshawar. The main etiology for mortality in neonates in our study were congenital abnormalities 66.7% followed by MAS 16.7% , RDS 8.3% ,birth asphyxia 6.2%, prematurity 5.3% and neonatal sepsis accounts for 4.8%.

This study showed 87.8% patients were discharged in stable condition after getting the required treatment.

Majority of Neonates were admitted with minor complaints those requiring only observation was one of major factor for higher rate of discharge in stable condition, other factors could be due to increasing awareness about neonatal care among health care workers, and facilitation of patients by best available care with limited resources. Additionally, in this study the rate of LAMA was 3% that is lower than in the Peshawar 7% [8] and is contributed mainly by parent's awareness regarding better treatment of their babies in hospital set up

CONCLUSION

Neonatal sepsis and Prematurity were found to be main causes of admissions followed by Neonatal Jaundice and Birth Asphyxia.

RECOMMENDATIONS

Major causes of admissions and associated morbidity and mortality are preventable and could be managed by improving awareness and knowledge among parents, antenatal care, and by facilitating government and private centers with basic necessary facilities and equipment, enhancing nursing and paramedics care to combat with such common and treatable conditions which will help to reduce the neonatal morbidity and mortality with limited resources eventually.

CONTRIBUTION OF AUTHORS

Yaqub A: Conceived idea, Designed research methodology, Data Collection, Manuscript writing
Ghani Z: Data Analysis and interpretation, Statistical analysis, Manuscript writing, Critical revision of article

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