Original Article

To Study the Incidence of Neonatal Morbidity in NICU In Tertiary Care Hospital

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Abstract

Background: The greatest risk of childhood death occurs during the neonatal period, which extends from birth through the first 28 days of life. About 60 percent of all deaths to children under age 5 and nearly two-thirds of infant deaths (birth to 12 months) occur during the neonatal period. About two-thirds of all neonatal deaths occur during the first week of life. *Objectives:* To study the incidence of neonatal morbidity in NICU, causes of neonatal morbidity in NICU, find out complications of neonatal morbidity, and find out number of home deliveries and hospital deliveries in NICU. *Study Design:* Retrospective Study. *Material and Methods:* A convenient sampling technique will be used whereby; all the patients who presented to NICU during study period would be included. An informed consent will be obtained and assessed clinically and laboratory investigation. The data analysis will be done using the Excel program. *Result :* Prematurity, low birth weight, birth asphyxia, hypoxic ischemic encephalopathy and sepsis are the major causes of morbidity and mortality to the neonatal intensive care unit. The high neonatal mortality warrants an urgent need to identify and reduced the risk factors with emphasis on prematurity, low birth weight, birth asphyxia and sepsis. *Conclusion:* According to this study RDS, birth asphyxia and neonatal sepsis are leading causes of morbidities in newborn babies. In spite of many advances in neonatal care above factors still continue to be the leading causes of morbidity in neonates.

Keywords : NICU; Prematurity; Sepsis; Low Birth Weight.

Introduction

The neonatal period is a very vulnerable period of life due to many problems, which in most of the cases is preventable [1,2]. Of the 25 million babies born in India every year 1 million die, India alone contributes to 25% of neonatal mortality around the world. As per the National Family Health Survey-3 report, current neonatal mortality rate (NMR) in India is 39 per 1000 live births, neonatal deaths accounts for nearly 77% of all infant deaths (57/1000) and nearly half of under-five child deaths (74/1000) [3] Preterm and low birth weight (LBW) babies are at increased risk of perinatal mortality and morbidity [4]. As per the report sheet published in the Lancet, the major direct causes of neonatal mortality are pre-term birth (27%), infection (26%), asphyxia (23%), congenital anomalies (7%), others (7%), tetanus (7%), and

diarrhoea (3%) [5]. There are very scanty data which are available regarding the neonatal mortality and morbidity pattern in India. Advancement in perinatal and neonatal care have significantly helped in reducing NMR in developed countries, but the mortality and morbidity are still high in developing countries [6]. The rural population of India which accounts for 70 percent of total population still needs easily accessible mother and child health care facilities [7]. The neonatal intensive care facilities are still scare and mostly concentrated in urban areas. The tertiary level neonatal care intensive unit (NICU) are also scanty all over country mainly located in metro cities [8]. The available statistical data about neonatal mortality and morbidity is mainly from metropolitan cities and fails to represent the country completely. Thus inverse care law remains valid which states that "The availability of good medical care tends to

vary inversely wit the need for it in the population served" [9]. For newborn babies, this law could appropriately be renamed the inverse information and care law i.e. the communities with the most neonatal deaths have the least information on these deaths and the least access to cost-effective interventions to prevent them [10].

Objectives
- To study the incidence of neonatal morbidity in NICU
- To know the causes of neonatal morbidity in NICU
- To find out complications of neonatal morbidity
- To find out number of home deliveries and hospital deliveries in NICU

Material and Methods

Study Type
Retrospective Study

Study Duration
3 months

Study area & study population
All neonates admitted to NICU at PDVVPF's Dr. Vikhe Patil MC & H Ahmednagar

Sample Size
150 patients.

Inclusion Criteria
All neonates admitted to NICU.

Exclusion Criteria
Neonates who left hospital against medical advice (LAMA) and neonates who were referred due to non-availability of beds and surgical intervention were excluded from the study.

Sampling Technique
A convenient sampling technique was used whereby all the patients who presented to NICU during study period would be included.

Data Analysis
The data analysis is done using the Excel program. The p-value is the index for the alternate hypothesis whereby if $p < 0.05$ the observed outcome would be considered to be statistically significant. Correlation coefficient is used as the index for the correlation whereby Cc 0.5 would be considered to be significant.

Results

A total of 150 neonates were included for the data analysis. Out of this 60% (90) were male and 40% (60) were females, ratio is 1.5:1. Of the total admissions 71.33% (107) were inborn neonates and 28.66% (43) were outborn neonates (Table 1).

Table 1: Sex distribution of admitted neonates

Sex	Inborn (%)	Outborn (%)
Male	64(59.8)	26(60.4)
Female	43(40.2)	17(39.6)
Total	107(71.33)	43(28.66)

52% (78/150) neonates had birth weight >2500 g, 40.7% (61/150) of neonates belonged to LBW category (1500-2499 g), 6% (9/150) of neonates belonged to very LBW (VLBW) group (1499-1000 g), 1.33% (2/150) of neonates were of extremely LBW (ELBW) category (<1000 g).

On applying one sample Chi-square test to see the observed frequency distribution in males and females neonates overall admitted to NICU, it was found to be statistically significant ($P < 0.001$).

The major causes of the morbidity for admission to NICU were neonatal sepsis (28.6%), respiratory distress syndrome (RDS) (24.0%), hypoxic ischemic encephalopathy (17.3%),neonatal jaundice (6.6%) and meconium aspiration syndrome (5.3%) (Table 2).

In this study, overall NICU mortality rate was 7.3% (11/150). The mortality rate in inborn neonates was 6.54% (7/107) whereas mortality rate in outborn neonates was 9.3% (4/43), the difference in mortality rate between inborn and outborn neonates was statistically insignificant ($P = 0.284$).

The mortality in males was 6.66% (6/90), in females was 8.3% (5/60), the difference in the mortality rate among male and female neonates was statistically insignificant ($P = 0.596$). The major causes for mortality were RDS (45.5%), hypoxic ischemic

encephalopathy (27.3%), and neonatal sepsis (18.2%) (Table 3).

On comparing survival among different birth weight groups (Table 4), it was seen that there was statistically significant difference between VLBW and normal birth weight group ($P \leq 0.05$), and between ELBW and normal birth weight group ($P \leq 0.05$).

However, there was no statistically significant difference in survival among LBW and normal birth weight group ($P = 0.368$).

Table 2: Morbidity profile of neonates admitted to NICU

Morbidity profile	Inborn (%)	Outborn (%)	Total (%)
Respiratory distress syndrome	25(23.3)	11(25.5)	36(24)
Meconium aspiration syndrome	5(4.6)	3(6.9)	8(5.3)
Respiratory distress (other causes)	3(2.8)	1(2.3)	4(2.6)
Hypoxic ischemic encephalopathy	19(17.7)	7(16.2)	26(17.3)
Sepsis/pneumonia/meningitis	31(28.9)	12(27.9)	43(28.6)
Neonatal jaundice	7(6.5)	3(6.9)	10(6.6)
Congenital anomaly	5(4.6)	1(2.3)	6(4)
Intrauterine growth restriction	6(5.6)	2(4.6)	8(5.3)
Hypothermia	1(0.9)	1(2.3)	2(1.3)
Hypoglycemia	2(1.8)	1(2.3)	3(2)
Others	3(2.8)	1(2.3)	4(2.6)
Total	107(100)	43(100)	150(100)

Table 3: Comparison of deaths among inborn & outborn neonates

Cause of neonatal death	Inborn (%)	Outborn (%)	Total (%)
Respiratory distress syndrome	3(42.8)	2(50)	5(45.5)
Sepsis/meningitis/pneumonia	1(14.3)	1(25)	2(18.2)
Meconium aspiration syndrome	0(0)	0(0)	0(0)
Hypoxic ischemic encephalopathy (birth asphyxia)	2(28.6)	1(25)	3(27.3)
Congenital anomaly	1(14.3)	0(0)	1(9.0)
Total	7(100)	4(100)	11(100)

Table 4: NICU outcome in different birth weight group

Birth weight	NICU admission (%)	Deaths (%)	Percentage of death is each group (%)
More than 2500 g	78(52.0)	4(36.3)	5.13
LBW (1500-2499 g)	61(40.7)	3(27.3)	4.92
VLBW (1000-1499 g)	9(6.0)	3(27.3)	33.34
ELBW (<1000 g)	2(1.3)	1(9.1)	50.0
Total	150(100)	11(100)	-

Conclusion

According to this study RDS, birth asphyxia and neonatal sepsis are leading causes of morbidities in newborn babies. In spite of many advances in neonatal care above factors still continue to be the leading causes of morbidity in neonates.

Common causes of neonatal mortality were RDS, birth asphyxia, neonatal sepsis and congenital anomalies.

The majority of morbidities and subsequently the mortalities can be prevented by improving antenatal care, maternal health, timely intervention, referring at appropriate time to tertiary care centers for high risk cases, preventing preterm deliveries and care of neonates at centers with facility.

This study has some limitations, as this was a hospital based retrospective study, the cause of death was determined using the data available in case record sheets, Neonates who LAMA and those who were referred to other centers due to non-availability of NICU beds and needed surgical intervention were excluded from study and could hence modify the results.

In our study, we did not divide the deaths into early and late neonatal period. As the majority of the patients presenting to us belong to low socio-economic status, the results from this study cannot be a complete reflection of the problem in the community as a whole.

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