



## MORBIDITY AND MORTALITY PROFILE OF NICU IN A ZONAL HOSPITAL OF ARMED FORCES IN CENTRAL INDIA, A RETROSPECTIVE STUDY

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### ABSTRACT

**Introduction:** Neonatal period is the most vulnerable period in human life and has lifelong repercussions.

In depth knowledge of the profile of neonatal diseases helps in proper management of common neonatal problems which leads to better survival rates and improved quality of life among survivors.

**Method:** A hospital based prospective study was conducted after approval from the hospital ethical committee during the period of July 2011 to April 2016. A total of 955 newborns were admitted to NICU during this period

**Result:** The major cause of morbidity was neonatal hyperbilirubinemia requiring phototherapy, low birth weight babies less than 1800 grams who required special care, sepsis, and lesser common causes like hypoxia, respiratory distress and congenital anomalies.

The overall mortality was 18 and the rate was (1.78%). The cause of mortality was due to Various Congenital Anomalies -07(0.73%), Extremely Low Birth Weight-03(0.31%) Intracranial hemorrhage- 03(0.31%), Respiratory Distress Syndrome-03 (0.31%) and Sepsis-02(0.20%).

**Conclusion:** This study identifies neonatal hyperbilirubinemia being the most important cause of morbidity and multiple congenital anomalies, low birth weight, and sepsis as causes of mortality in that order.

Improving the antenatal care, maternal health and timely intervention by referral to tertiary centers may go a long way in improving neonatal outcome.

**KEYWORDS :** Neonatal morbidity, Neonatal mortality , Low Birth Weight, Neonatal Hyperbilirubinemia

### Aim and Objective

The aim of this study was to carry out a Retrospective Analysis of NICU morbidity and mortality profile in a service hospital in central India and compare it to figures and data available in respect to India and worldwide and also to analyze the reasons of the same and understand the implications. The study was carried out during the period July 2011 and April 2016. A total of 955 newborns were admitted during this period in the NICU and were enrolled for the study.

### 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 ) Morbidity and Mortality rates are good indicators to measure the level of health and health care in a hospital, district, state or country. Although Perinatal period occupies less than 0.5 percent (less than 168 hrs) of average lifespan ,there are more deaths within this period than during the next 30-40 years of life in many developing countries (3,4).According to a study published in Lancet the direct causes of death in neonatal period were preterm births 21%,infections 26%,asphyxia 23%,congenital anomalies 7%,tetanus 7% and diarrhea 3% and others 7%.It is proved beyond doubt that improved level of newborn care can bring down the mortality rates. About 0.75 million neonates die every year in India, the highest for any country in the world. It is more than 25% of the total global neonatal deaths which occur in India.(5,6) The neonatal mortality rate (NMR) in India has declined from 52 per 1000 live births in 1990 to 28 per 1000 live births in 2013 (7), but the rate of decline is slow and lags behind that of infant and under-five child mortality rates. The millennium goals 2015 have not been achieved which focused on decreasing neonatal mortality rate to less than 10, however significant work has been done to improve neonatal mortality rate in India. A retrospective study was carried out on 955 newborns admitted to NICU in a zonal services hospital in central India during the period of July 2011 to Jun 2016 . This study gives a brief analysis and profile of morbidity and mortality in a zonal service hospital in central India. We undertook this study to find out the predominant causes of neonatal morbidity and mortality amongst newborns admitted to NICU, and therefore look into the burden of preventable causes, thus helping in formulating strategies to control neonatal mortality rate.

### Materials and Methods

This study was conducted by the Department of Pediatrics in a service zonal hospital in central India which has with trained & dedicated staff along with latest medical equipments. Indian Armed Forces comprises of people from all corners of Indian subcontinent. The medical facilities in a military hospital is available to authorized clientele free

of cost where dedicated specialized medical personnel are responsible for providing medical care round the clock and are fully accountable to the client and organization. All requisite medical assistance is made available .This was a hospital based study over a period of 05 years i.e. Jul 2016 to Jun 2016.All neonates inborn and out born were included although the number of out born babies was very small.

**Inclusion criteria:** 1.All neonates brought to NICU.2. All newborns in whom parental consent was obtained.

**Exclusion criteria:** 1.Babies which were taken away against medical advice.

**Study period:** 05 years

### Results

Total number of admissions during the period July 2011 to Jun 2016 was 955. Most of them were inborn i.e.913, the percentage being 95.60 %.The number of out born babies was only 42 (4.39%).There was no gender bias .The number of male babies was 497(52%) and that of female babies was 458 (47.95%).Table 1 .

**Table-1 Mode of admission & Sex distribution of NICU admissions**

	Inborn	Out born	Total
Admissions	913	42	955
Percentage	95.60%	4.39%	100%
Gender	497	458	955
Percentage	52%	47.95 %	100 %

**Table-2,Causes of Neonatal Morbidity in this study (N=955)**

Neonatal Hyperbilirubinemia Requiring Phototherapy/Exchange Transfusion	373(39.05%)
LBW-Wt less than 1800 grams	219 (22.93%)
Respiratory distress syndrome	74 (7.74%)
Meconium Aspiration Syndrome	37 (3.87%)
Hypoxic Ischemic Syndrome	34 (3.56%)
Sepsis	37 (3.87%)
Seizures	28 (2.93%)
Hypoglycemia	27 (2.82%)
Hypocalcaemia	23(2.4%)
Conjunctivitis	26 (2.72%)
Umbilical sepsis	19 (1.98%)
Meningitis	06 (0.62%)
Intracranial hemorrhage	06 (0.62%)

Acute Osteomyelitis	01 (0.10%)
Congenital Anomalies	52 (5.22%)
Congenital Heart Diseases	14 (1.46%)
HIV	08 (0.83%)
Congenital adrenal hyperplasia	02 (0.20%)
Down's syndrome	03 (0.31%)
Meningocele	06(0.62%)
Anorectal malformation	03(0.31%)
Tracheoesophageal fistula	02 (0.20%)
Diaphragmatic hernia	02 (0.20%)
VACTERL /VATER anomaly	02 (0.20%)
Others Unclassified	10 ( 1.04%)

**Table3,Causes of Neonatal Mortality in this study  
Total Neonatal deaths –18, (Total babies admitted to NICU-955)**

	Early neonatal deaths	Late neonatal deaths
Multiple Congenital anomalies	7( 41.1%)	--
ELBW	3 (17.6%)	
Sepsis		2(11.7%)
Intracranial hemorrhage	2(11.7%)	--
RDS	3(17.6%)	--

Low birth weight babies were seen in 22.93% of neonates admitted to NICU and the remaining had normal birth weight. Extremely low birth weight babies who got admitted to NICU was 13. The morbidity pattern i.e. cause of hospital admissions was neonatal hyperbilirubinemia requiring phototherapy or exchange transfusion was 373 (39.05%), low birth weight babies (<1800 gms)- 219 (22.93%), Respiratory Distress Syndrome-74(7.74%), Meconium Aspiration Syndrome-37 (3.87%), sepsis-37 (3.87%), Perinatal hypoxia-34 (3.5%), Seizures-28 (2.93%), Hypoglycemia-27 (2.82%), Hypocalcaemia-23(2.4%), Intracranial Hemorrhage-06 (0.62%), HIV-08 (0.83%), Various Congenital Anomalies-29(3.03%).

The overall mortality was 18(1.88%). The major cause of mortality was multiple Congenital Anomalies -07, Extremely Low Birth Weight-3, intracranial hemorrhage- 03, Respiratory Distress Syndrome-3 and Sepsis-2.

## DISCUSSION

In this study in which 955 newborns were admitted in NICU of a defense zonal hospital the male to female ratio was almost equal, 497 males to 458 females which is contrary to various studies in India including National Neonatal Perinatal Database(8,9,10). In this study only 22.93% had low birth weight which is again contrary to studies conducted by Veena Prasad et al (10) and some other studies where number of LBW were significantly more.

The main causes of NICU admissions were Neonatal Hyperbilirubinemia requiring phototherapy or exchange transfusion was 373 (39.05%), Low Birth Weight Babies (<1800 gms)- 219 (22.93%), Respiratory Distress Syndrome-74 (7.74%), Meconium Aspiration Syndrome & sepsis both-37 (3.87%), Hypoxic Ischemic Encephalopathy-34 (3.5%), multiple congenital anomalies- 29 (3.03%), Seizures-28 (2.93%), Hypoglycemia-27 (2.82%), Hypocalcaemia-23(2.4%), Intracranial hemorrhage-06 (0.62%), HIV-08 (0.83%). Studies from Africa by Orimadegun AE et al, Owa JA, and Simiyu DE show more admissions due to sepsis, jaundice and tetanus. (12,13,14). In developed countries, the scenario is different with extreme prematurity and congenital anomalies being the main causes (15). The incidence of birth asphyxia was 3.5% in our study which is less than most of the Indian Studies. (16) published.

The mortality rate observed was 1.88% which is much less when compared to various studies reported in India, Africa and most of the western countries. (17,18,19,20) The major cause of mortality in our study is multiple Congenital Anomalies -07, Extremely Low Birth Weight babies-3, Intracranial hemorrhage- 03, Respiratory Distress Syndrome-3 and Sepsis-03.

In our study which was done in an army hospital with all requisite facilities it is seen that the results are comparable to the best of the centers in the world and same has been achieved by a dedicated organization which maintains complete up to date records of the

patients and has motivated and focused doctors and paramedical staff with no commercial angle attached and full accountability at all levels.

## CONCLUSION

Morbidity and Mortality rates are good indicators to measure the level of health and health care in a hospital, district, state or country. It also helps in assessing the overall socioeconomic development of a country. Perinatal mortality rate has assumed greater significance as a yardstick of obstetric and pediatric care before and around the time of birth although perinatal period occupies less than 0.5 percent (less than 168 hrs) of average lifespan; there are more deaths within this period than during the next 30-40 years of life in many developing countries.

This study identifies neonatal hyperbilirubinemia being the major cause of morbidity and multiple congenital anomalies, low birth weight, and sepsis as primary causes of mortality in that order.

Improving the antenatal care, maternal health and timely intervention by referral to tertiary centers will certainly help in improving neonatal outcome.

## Limitations

This was a retrospective hospital based study. The extent of Morbidity and mortality was based on the official hospital records and this may not be the exact reflection of morbidities and mortality of new born in the society at large.

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