

Perinatal Morbidity and Mortality Pattern in Admitted Neonates With out of Hospital Birth History: A Descriptive Retrospective Study

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Abstract:

Background and Objectives: The current newborn mortality rate (NMR) in India is 24.9 per 1,000 live births, according to the National Family Health Survey-5 (NFHS-5) report. With all nations intending to reduce neonatal mortality to at least 12 deaths per 1,000 live births, a proposed Sustainable Development Goals (SDGs) objective for child mortality intends to end the avoidable deaths of newborns and children under the age of five by 2030. In order to improve newborn outcomes and lower the mortality rate, Special Newborn Care Units (SNCUs) should be established in each district. The study's goal was to identify the illness distribution and contributing factors to infant death in tertiary neonatal care units. In order to apply measures for reducing avoidable causes of newborn morbidity, the research's goal was to evaluate the common reasons for admission to the study center's NICU and the outcomes of hospitalized neonates.

Material and Methods: After receiving approval from the institutional ethical committee and the parents' informed written consent, the descriptive, retrospective, clinical, hospital-based study involved 500 out-born neonates who were admitted to the Neonatal Intensive Care Unit (NICU) of the Department of Paediatrics at a Government Medical College and Hospital in central India between August 2014 and September 2016. Data on the admission of out born children, including the gender, age of gestation, weight for gestation, reasons for admission, length of hospitalization, complications faced, investigations conducted while in the hospital, and outcomes were retrieved. SPSS statistical software version 26 was used to analyze all of the gathered data.

Results: Study comprised of total 500 neonates' morbidity pattern showed maximum share of respiratory distress 329 cases (65.8%) followed by prematurity 17.4% (n=87) and neonatal jaundice 9% (n=45). Mortality was 142 cases (28.4%). Case fatality for respiratory distress syndrome was 46.4% (n=60), followed by non-nutritive sucking 21.49% (n=30), prematurity 15.49% (n=22) and hypoxic ischemic encephalopathy 9.2% (n=13).

Conclusion: According to our research, the three main causes of newborn death are respiratory distress syndrome, preterm birth, and low birth weight. Health care managers at the community level should plan and carry out interventions to lower preterm birth, low birth weight, and birth asphyxia.

Keywords: Neonatal morbidity; Neonatal mortality; NICU; Causes of neonatal mortality.

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Introduction

The most crucial time of life is when a baby is born since they are susceptible to several ailments. Variable nations and regions within one nation have variable rates of new-born mortality and morbidity. Prematurity (35%), neonatal infections (33%), intrapartum-related complications/ birth asphyxia (20%), and congenital deformities (9%), are the main causes of newborn fatalities in India. [1] The main reasons babies were admitted to the NICU were sepsis, prematurity, and birth asphyxia. All of these etiologies are, to some extent, avoidable, and if identified earlier, they can be successfully treated to lower morbidity as well as mortality.

The current newborn mortality rate (NMR) in India is 24.9 per 1,000 live births, as per to the National Family Health Survey-5 (NFHS-5) report. With all nations intending to reduce neonatal mortality to at least 12 deaths per 1,000 live births, the proposed Sustainable Development Goals (SDGs) objective for child mortality intends to stop avoidable deaths of newborns and children under the age of five by 2030. In order to improve newborn outcomes and lower the mortality rate, Special Newborn Care Units (SNCUs) should be established in each district.

The goal of the study is to evaluate the common reasons for admission, outcomes, and referrals of neonates hospitalized to special newborn care units in other hospitals outside of our setup. Since the majority of the causes of neonatal morbidity and death are avoidable, it is helpful to develop newborn and prenatal care programmers in order to reduce neonatal morbidity.

Aim and Objectives:

The aim of the study was to assess the common causes for admission in to NICU of study centre and outcome of admitted neonates to implement the strategies for

reduction of preventable causes of the neonatal morbidity.

Material and Methods:

This was a descriptive, retrospective, clinical, hospital based study on 500 out born neonates admitted in the Neonatal Intensive Care Unit (NICU) of the Department of Pediatrics, in a Government medical college and hospital of central India from August 2014 to September 2016. The Ethical Committee approved the study, and the parents gave their full, written consent after receiving information about it.

Inclusion criteria: all the neonates brought alive to neonatal unit were included in the study.

Exclusion criteria: children more than 28 days in age and neonates brought dead to the neonatal unit were excluded from the study.

Methods of collection of data: The information on admission of out born children, gender, gestational age, weight for gestation, reasons for admission, length of hospitalization, complications faced, investigations conducted while in the hospital, as well as outcomes were retrieved. A thorough prenatal, birth, and postpartum history was elicited and recorded. All the admitted neonates underwent detailed general physical and systemic examination and investigations as per hospital protocol. Final outcome whether discharged, Expired, Abscond and LAMA and duration of hospital stay were recorded.

Statistical Analysis:

In an excel sheet, data was gathered, assembled, and tallied. Quantitative information was shown as a number and a percentage. Quantitative information was displayed as mean and standard deviation. Software named SPSS 26.0 (IBM, SPSS, Inc.) was used for the statistical analysis.

Values with $p < 0.05$ are regarded as statistically significant.

Results

In present study, we observed 500 out born neonates admitted in the Neonatal Intensive Care Unit (NICU) of the Department of Pediatrics, in a Government medical college and hospital of central India from August 2014 to September

2016. Proportional mortality was found to be significantly high ($p = > 0.05$) in-

- > 37 weeks newborns (65.17%)
- Extreme low birth weight babies (100%)
- Neonate admitted in within 24 hour of life (34.39%)
- Vaginal delivery (29.51%) [Table 1]

Table 1: Factors affecting proportional mortality rate

Variables		Admission (N,%)	Mortality (N,%)	Proportional Mortality rate
Gestational age	<28 weeks	16 (3.2%)	04 (2.81%)	25%
	28-32 weeks	120 (24%)	18 (12.67%)	15%
	32-37 weeks	252 (50.4%)	47 (33.09%)	12.65%
	>37 weeks	112 (22.4%)	73 (51.40%)	65.17%
Gender	Male	301 (60.2%)	82 (57.7%)	27.24%
	Female	199 (39.8%)	60 (42.3%)	30.15%
Birth weight (kg)	< 1	17 (3.4%)	17 (11.97%)	100%
	1-1.5	83 (16.6%)	44 (30.98%)	53.01%
	1.5-2.5	250 (50%)	52 (36.61%)	20.8%
	>2.5	150 (30%)	30 (21.12%)	20%
Age at Admission	< 24 hrs.	282 (56.4%)	97 (68.30%)	34.39%
	24-72 hrs.	63 (12.6%)	07 (4.92%)	19.44%
	3-7 days	67 (13.4%)	13 (9.15%)	19.40%
	>7 day	88 (17.6%)	25 (17.60%)	28.40%
Mode of Delivery	Vaginal	471 (94.2%)	139 (97.88%)	29.51%
	LSCS	29 (5.8%)	03 (2.11%)	10.34%

Most of morbidity in newborn occurs due to neonatal septicemia 32.8% and Prematurity 31.8%. Nearly 40% babies had two or more problem at time of admission. [Table 2]

Table 2: Cause wise morbidity

Morbidity	N	%
Neonatal Hyperbilirubinemia	45	9%
Prematurity	157	31.4%
Neonatal Septicemia	164	32.8%
Meconium Aspiration	27	5.4%
Birth Asphyxia	76	15.2%
Major Congenital Malformation	22	4.4%
Respiratory Distress syndrome	9	1.8%

Major cause of death in this study was RDS 46.4% followed by NNS 21.9%, ELBW 4.2% and MAS 1.4 %. [Table 3]

Table 3: Cause Wise Mortality

Cause wise Mortality	N	%
Hypoxic Ischemic Encephalopathy (HIE)	13	9.2
Prematurity	22	15.49
Non-Nutritive Sucking (NNS)	30	21.49
Respiratory Distress Syndrome (RDS)	60	46.4
Extremely Low Birth Weight (ELBW)	6	4.2
Meconium Aspiration syndrome (MAS)	2	1.4
Congenital pneumonia	1	0.7
Congenital Heart Disease (CHD)	1	0.7
Congenital Malformation	1	0.7
Total	142	100

62% of all the admitted newborns were discharged, 28.4% newborns expired and 9 % newborns leave against medical advice (LAMA). [Table 4]

Table 4: Outcome of Hospitalized Neonates

Cause wise Mortality	N	%
Discharge	310	62%
Death	142	28.4%
Leave Against Medical Advice (LAMA)	45	9%
Abscond	0	0%
Referred	3	0.6%
Total	500	100%

Discussion

Each year, thousands of potential citizens are lost due to neonatal mortality. In addition to being a terrible economic and societal loss, this causes thousands of parent's unimaginable anguish. Therefore, pediatricians find this sector to be filled with difficult mysteries. Out of 500 newborns, the majority were hospitalized within a day of delivery. Neonatal patients hospitalized within 24 hours of birth had a higher proportional death rate (chi square=16.9; p 0.05). The fact that so many really ill newborns are admitted to hospitals soon after delivery may be the explanation of this high fatality rate. In the current study, 94.2% of infants were born vaginally, whereas 5.8% were delivered using LSCS. Proportional mortality rate was higher 29.51% in vaginal delivery (chi square=4.93) (p = >0.05).

M. Singh et al [6] reported that 63.6% were spontaneous vaginal delivery while 28.7% babies were delivered by caesarean

section and 10% by assisted vaginal delivery. J. P. Singh et al [7] in their study found the 31.4% LSCS and 45.7% of unassisted vaginal delivery.

In present study, the main complaints for hospitalization of newborn are respiratory distress (65.8%), prematurity (17.4%), jaundice (9%), congenital malformations (4.4%) and meconium aspiration (2.6%). Nearly 40% babies had two or more problem at time of admission and most of the morbidities in newborn occurred due to neonatal septicemia (32.8%) and Prematurity (31.8%), and other causes includes meconium aspiration (17.35%), birth asphyxia (15.2%) and neonatal hyperbilirubinemia (9%).

M. Singh et al [6] reported morbidity pattern at AIIMS in 7015 live births, out of which, 414 (5.9%) babies had birth asphyxia II and III, 400 (5.6%) had RDS, 2 (5.9%) had hyperbilirubinemia and 125 (1.8%) babies had culture positive neonatal septicemia.

J. P. Singh et al [7] demonstrated that birth asphyxia was found in 75% of cases in their study group. Neurological complication reported in 51% of cases, followed by, pulmonary complications (36%), neonatal septicemia (18%), and major congenital malformation (11.19%).

G. K. Mukasa et al [8] reported that morbidity pattern in low birth weight (<2.5 kg) babies were prematurity (48.4%), birth asphyxia (24.2%), respiratory distress syndrome (15.2%). In babies with >2.5 kg birth weight, causes of morbidity were birth asphyxia (53.1%), birth injuries (21.1%), and meconium aspiration (2%).

According to J. N. Bhall et al [9], hypoxia (27.4%) and newborn infection (31.4%) were the two causes of the greatest morbidity.

Present study observed that the commonest organism growth in blood culture were Staphylococcus (27.54%), E.coli (21.54%), and proteus (4.19%). K. A. Kuruvilla et al [10] reported E.coli (23.3%) and E.fecalis (20%) in early onset septicemia.

P. Chaturvedi [11] reported 60.1% were gram negative growth, 40% were gram positive bacterial growth and staphylococcus growth was found to be 35%, Klebsiella 25%, E.coli 15.9%, and pseudomonas 13.4%. N. Mehrotra et al [12] found that the commonest organisms were pseudomonas 41.3%, E.coli 37% and gram positive cocci 13.1%.

These bacterial growth difference occur in our study may be due to environmental flora and Nosocomial flora differ in geographical area and various antenatal factors in mother described to predispose neonates to sepsis.

It was found that the major etiological cause of death in present study was RDS (46.4%) followed by NNS (21.12%), ELBW (4.2%) and MAS (1.4%).

M.S. Sarna et al [13] reported that respiratory distress and prematurity

(29.3%), sepsis (24.4%) and asphyxia (16.2%) contributed to neonatal deaths.

Proportional mortality was highest (100%) in extreme low birth weight babies. Mortality was significantly high in extreme low birth weight (chi square=53.12), (p <0.05). In present study, 62% of all the admitted newborns were discharged, 28.4% newborns expired and 9 % newborns leave against medical advice (LAMA).

Conclusion

In our investigation, the main contributing factors to neonatal death were respiratory distress syndrome, preterm and low birth weights. Health care managers at the community level should plan and carry out interventions to lower preterm birth, low birth weight, and birth asphyxia. The "Risk Approach" is the most realistic and feasible approach for offering community members basic perinatal care.

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