

A CLINICAL STUDY OF NEONATES FROM A TERTIARY CARE TEACHING HOSPITAL IN SOUTHERN HARYANA

SHRADHANG PRATAP GAUTAM¹, PRIYANKA TANK^{1*}, ARTI DHINGRA¹, MEETU YADAV¹,
BABITA KHICHAR¹, RAKESH TANK²

¹Department of Paediatrics, SHKM Govt. Medical College, Nuh, Haryana, India. ²Department of General Medicine, SHKM Govt. Medical College, Nuh, Haryana, India

*Corresponding author: Priyanka Tank; Email: drpriyanka3112@gmail.com

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ABSTRACT

Objectives: The present investigation has been undertaken to study certain aspects of neonates clinically at a tertiary care teaching hospital in southern Haryana.

Methods: All the patients attending the pediatric department referred from peripheral healthcare facilities to the study site and neonates delivered at the study site formed the study population. Neonates subjected to two or more inter-healthcare facility referrals, neonates with surgical conditions and neonates whose parents/legal caretaker denied consent, were excluded from this study.

Results: Among 256 neonates, 59 (23.0%) neonatal sepsis was present out of which 16 (17.8%) were inborn neonates and 43 (25.9%) were outborn neonates. One hundred and ninety-nine (77.7%) neonates were discharged after treatment out of which 76 (84.4%) were inborn neonates and 123 (74.1%) were outborn neonates. One hundred and ninety-nine (77.7%) neonates were discharged after treatment out of which 76 (84.4%) were inborn neonates and 123 (74.1%) were outborn neonates, whereas 40 (15.6%) unfortunately experienced a fatal outcome (death) out of which 9 (10.0%) were inborn neonates and 31 (18.7%) were outborn neonates.

Conclusion: Respiratory distress syndrome, neonatal jaundice, and meconium aspiration syndrome are significant contributors to morbidity in newborns. The most prevalent causes of mortality included prematurity, respiratory distress syndrome, birth asphyxia, and sepsis.

Keywords: Infant, Newborn, Intensive care, Neonatal, Mortality.

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INTRODUCTION

India has a significant neonatal death rate compared to several countries globally. The majority of fatalities transpire during the early neonatal period [1]. Approximately 4 million deaths are recorded within the 1st month of life. Ill newborns are referred from subcenters and primary health centers to advanced healthcare facilities such as secondary and tertiary care centers [2]. Referral causes encompass prematurity, birth asphyxia, neonatal jaundice, septicemia, convulsions, congenital malformations, and treatment for surgical conditions such as tracheo-oesophageal fistula, imperforate anus, congenital heart diseases, diaphragmatic hernia, intestinal obstruction, congenital hypertrophic pyloric stenosis, and other surgical disorders [3,4].

Efficient referral services can preserve several infants. To adequately supply the pediatrics department with personnel, medications, and equipment in proportion to the volume of referred newborns, it is essential to determine the quantity and clinical characteristics of the neonates received in the department [5]. The comparison of outcomes between referred neonates admitted to the department and those born in the institution is essential to demonstrate the impact of referral on neonatal outcomes [6].

This knowledge can enhance neonatal outcomes. Furthermore, scant data exists in the literature concerning this issue, and no studies have previously been undertaken in the Mewat region. This study aimed to address this gap. The present investigation has been undertaken to study certain aspects of neonates clinically at a tertiary care teaching hospital in southern Haryana.

METHODS

An observational study was conducted in the Department of Pediatrics, SHKM Government Medical College, Nuh. The study population comprised all patients referred from peripheral healthcare facilities to the pediatric department and newborns delivered at the study location. Neonates referred to two or more healthcare facilities, those with surgical problems, and those whose parents or legal guardians declined consent were excluded from this study.

The neonates transferred from other healthcare facilities (outborn) were initially stabilized in the pediatric emergency department at the research site. Newborns born at the study location and transferred to the (neonatal intensive care unit) NICU or ward for medical issues were first stabilized and thereafter enrolled in the study according to the inclusion criteria. Informed consent was obtained from one of the parents or the legal guardian.

Axillary temperature measurement, hemodynamic assessment, and neurological evaluation were conducted. Random blood sugar was assessed using a glucometer, whereas a laboratory sample for random blood sugar was concurrently dispatched. A comprehensive history and examination of the outborn neonate were conducted. All requisite investigations were tailored to the individual patient.

Information concerning maternal health was gathered during the initial meeting and documented according to the established timeline. Information concerning the travel of the referred neonate was gathered and documented from the parents, guardians, or

accompanying healthcare provider, and enquiries were made regarding the referral card. Data were requested concerning the vehicle type, distance traveled, reason for referral, and treatment administered during transfer. Enquiries were made on the presence or absence of a healthcare provider accompanying the neonate during travel. Inborn and outborn newborns were compared for clinical presentation and outcomes.

Approval was secured from the institutional ethical committee before the initiation of this project. Informed written consent was acquired from parents following an explanation of the study methodology in their native language. The data were coded and entered into Microsoft Excel 2010 (Microsoft corp.), analyzed using Excel 2010 and SPSS 20.0 for Windows (SPSS inc). The data were processed and the sensitivity, specificity, and positive and negative predictive value were calculated.

RESULTS

Data were 256 subjects was analyzed and presented here. Among 256 neonates, sepsis was present in 59 (23.0%) cases, comprising 16 (17.8%) inborn and 43 (25.9%) outborn neonates. Jaundice was observed in 33 (12.9%) neonates, with 16 (17.8%) inborn and 17 (10.2%) outborn neonates affected. Hypoglycemia was identified in 11 (4.3%) neonates, including 4 (4.4%) inborn and 7 (4.2%) outborn neonates (Table 1).

Table 2 depicts that the inborn neonate mean duration of stay was 5 days and in outborn neonate mean duration of stay was 9 days.

Out of the total sample size of 256 neonates, 199 (77.7%) neonates were discharged after treatment out of which 76 (84.4%) were inborn neonates and 123 (74.1%) were outborn neonates, whereas 40 (15.6%) unfortunately experienced a fatal outcome (death) out of which 9 (10.0%) were inborn neonates and 31 (18.7%) were outborn neonates (Table 3).

DISCUSSION

Neonatal morbidity and mortality rates reflect a nation's socioeconomic level and the quality and efficacy of its healthcare system. The India Newborn Action Plan, initiated in September 2014, aims to expedite the decrease of preventable newborn fatalities and stillbirths, with the objective of achieving a "single-digit neonatal mortality rate (NMR) by 2030." [7] This study sought to document specific characteristics of neonates in a tertiary care teaching hospital located in southern Haryana. Data from (256 participants were analyzed.

In our study of 256 neonates, sepsis was identified in 59 (23.0%) cases, comprising 16 (17.8%) inborn and 43 (25.9%) outborn neonates. Jaundice was present in 33 (12.9%) neonates, with 16 (17.8%) inborn and 17 (10.2%) outborn. Hypoglycemia was observed in 11 (4.3%) neonates, including 4 (4.4%) inborn and 7 (4.2%) outborn neonates. Yousuf *et al.* documented an 85% effective discharge rate among 336 infants from a secondary-level NICU in Bathinda, Punjab, in 2017 [8]. Hyperbilirubinemia, sepsis, and prenatal asphyxia were the predominant causes of hospitalization. Neogi *et al.* [9] examined the operations of eight SNCUs in rural Indian districts within 2 years of their creation in 2009. The case-fatality rate decreased by 40% within 1 year of operation. The proportional mortality attributable to sepsis and low birth weight (LBW <2.5 kg) decreased markedly during a 2-year period. The primary reasons for admission and the principal causes of mortality identified in this study were birth asphyxia, sepsis, and LBW/prematurity.

In this study, from a total sample size of 256 neonates, 199 (77.7%) were discharged following treatment, comprising 76 (84.4%) inborn neonates and 123 (74.1%) outborn neonates. Conversely, 40 (15.6%) suffered a fatal outcome, including 9 (10.0%) inborn neonates and 31 (18.7%) outborn neonates. Sridhar *et al.* conducted a retrospective analysis including 1,487 neonates at a Tertiary Care Teaching Hospital

Table 1: Comparison of inborn neonates and outborn neonates as per clinical profile

Variable	Inborn (n=90%)	Outborn (n=166%)	Total (%)	p-value
Neonatal sepsis	16 (17.8)	43 (25.9)	59 (23)	0.14
Jaundice	16 (17.8)	17 (10.2)	33 (12.9)	0.12
Hypoglycemia	4 (4.4)	7 (4.2)	11 (4.3)	0.93
Pneumonia	2 (2.2)	9 (5.4)	11 (4.3)	0.22
Birth asphyxia	4 (4.4)	32 (19.3)	36 (14.1)	0.001 (S)
Respiratory distress syndrome	12 (13.3)	35 (21.1)	47 (18.4)	0.12
Meconium aspiration syndrome	10 (11.1)	13 (7.8)	23 (9.0)	0.38
TTNB	22 (24.4)	22 (13.3)	44 (17.2)	0.02
Apnoea of prematurity	3 (3.3)	7 (4.2)	10 (3.9)	0.72
NEC	1 (1.1)	6 (3.6)	7 (2.7)	0.24
Meningitis	1 (1.1)	21 (12.7)	22 (8.6)	0.002 (S)

Table 2: Comparison of inborn neonates and outborn neonates as per duration of stay

Variable	Mean	Std. Deviation	p-value
Inborn	5.00	0.000	0.001 (S)
Outborn	9.10	6.097	

Table 3: Comparison of inborn neonates and outborn neonates as per outcome

Variable	Outcome			Total
	Death	Discharge	Refer	
Groups				
Inborn				
n	9	76	5	90
%	10.0	84.4	5.6	100.0
Outborn				
N	31	123	12	166
%	18.7	74.1	7.2	100.0
Total				
n	40	199	17	256
%	15.6	77.7	6.6	100.0

p=0.14

in Mandya, Karnataka, reporting approximately 5% referrals to other centers and 7% mortality, figures that are lower than those observed in our study. The primary contributors to morbidity were neonatal sepsis (28%), respiratory distress syndrome (RDS) (23%), and birth asphyxia (17%). The majority of fatalities were attributed to RDS (43%), birth asphyxia (37%), and newborn sepsis (8%), consistent with our clinical analysis [10].

In 2014, Patil Ravindra *et al.* conducted a cross-sectional study in a tertiary care NICU in Shivamogga, Karnataka, reporting an approximate discharge rate of 82% and a mortality rate of 10% among 1,041 neonates [11]. The predominant particular morbidity leading to admission was RDS (37%), succeeded by newborn jaundice (13%) and meconium aspiration syndrome (MAS) (13%).

Barkiya *et al.* identified analogous reasons with an improved prognosis of approximately 85% in 102 term and preterm neonates experiencing respiratory distress in a tertiary care NICU in Kunnur, India [12]. In contrast to the study conducted by Rakholia *et al.* [6] in Northern India, which identified RDS as the predominant cause of SNCU admission among inborn newborns, our findings indicate that congenital pneumonia was the most prevalent cause in the current study. We similarly discovered that birth asphyxia constituted the predominant

reason for SNCU admissions among outborn infants, contrasting with the findings of Rakholia *et al.* [13], who identified RDS as the most prevalent cause. The diversity within the study group, their health-seeking behaviors, and other unexamined factors may account for the heterogeneity of observations. The death rate was lower than reported in the study by Prasad and Singh [14] done in Uttarakhand. The primary causes of mortality were preterm (42.1%) and RDS (16.4%). Birth asphyxia and sepsis collectively accounted for 12% of total fatalities.

CONCLUSION

RDS, neonatal jaundice, and MAS are significant contributors to morbidity in newborns. The primary causes of mortality include prematurity, RDS, birth asphyxia, and sepsis, which are prevalent factors in neonatal mortality. The majority of morbidities and subsequent mortalities can be mitigated through the enhancement and effective execution of essential preventive services, such as maternal care and integrated management of neonatal and childhood illness, along with timely interventions and referrals to tertiary care centers for the management of high-risk pregnancies and the care of neonates in precarious situations.

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CONFLICT OF INTEREST

The authors assert that they do not possess any conflicts of interest.

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