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Original Research

Study of Incidence of Neonatal Jaundice in Newborns at a Tertiary Health Care Centre

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Abstract

Background: Neonatal jaundice is a common condition observed in the early neonatal period, primarily due to the physiological immaturity of the liver. While most cases are benign and self-limiting, severe hyperbilirubinemia can lead to kernicterus and other complications if not detected and treated early. This study aims to evaluate the incidence and associated risk factors of neonatal jaundice in newborns admitted to a tertiary health care centre.

Materials and Methods: A hospital-based prospective observational study was conducted in the Neonatal Intensive Care Unit (NICU) of a tertiary care hospital over a period of six months. A total of 300 neonates were included in the study. Data regarding gestational age, birth weight, mode of delivery, blood group, and onset of jaundice were collected. Serum bilirubin levels were measured and evaluated according to standard guidelines.

Results: Out of the 300 newborns observed, 168 (56%) developed neonatal jaundice. The incidence was higher in preterm infants (65%) compared to full-term infants (52%). Among affected neonates, 60% were male and 40% were female. ABO incompatibility (25%), low birth weight (18%), and cesarean section delivery (22%) were identified as significant risk factors. Phototherapy was required in 70% of the jaundiced neonates, while 4% needed exchange transfusion.

Conclusion: Neonatal jaundice remains a prevalent condition among newborns, particularly in those with identifiable risk factors such as prematurity and blood group incompatibility. Early identification and prompt management are crucial in preventing severe outcomes. Routine screening protocols should be emphasized in neonatal care settings.

Keywords: Neonatal jaundice, newborn, bilirubin, incidence, phototherapy, tertiary care, risk factors

Introduction

Neonatal jaundice is one of the most frequently encountered clinical conditions in the early neonatal period, affecting approximately 60% of term and 80% of preterm neonates during the first week of life (1). It is characterized by yellow discoloration of the skin and sclera resulting from an increased level of serum bilirubin. The condition is often benign and self-limiting; however, in some cases, it may progress to severe hyperbilirubinemia, leading to complications such as acute bilirubin encephalopathy and kernicterus if left untreated (2).

The pathophysiology of neonatal jaundice involves increased bilirubin production due to accelerated red blood cell turnover, coupled with the immature hepatic conjugation process and reduced excretory function of the neonatal liver (3). Risk factors associated with the development of jaundice include prematurity, low birth weight, ABO and Rh incompatibility, sepsis, cephalhematoma, and breastfeeding difficulties (4,5).

Early recognition and timely intervention are critical to prevent neurological damage and long-term morbidity. Screening and monitoring of serum bilirubin levels in the immediate postnatal period have significantly improved neonatal outcomes (6). Despite the availability of effective treatment modalities like phototherapy and exchange transfusion, delayed diagnosis remains a challenge in resource-limited settings (7).

This study was undertaken to determine the incidence of neonatal jaundice and identify associated risk factors among newborns admitted to a tertiary care hospital. Understanding the burden and predictors of this condition can aid in implementing timely interventions and reducing preventable complications.

Materials and Methods

A hospital-based prospective observational study was conducted in the Neonatal Intensive Care Unit (NICU) of a tertiary health care centre over a period of six months.Informed consent was obtained from the parents or legal guardians of all participating neonates.

A total of 300 newborns, both term and preterm, admitted to the NICU during the study period were included using consecutive sampling. Newborns with major congenital anomalies or those discharged

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within 24 hours of birth were excluded from the study.

Relevant clinical information such as gestational age, birth weight, sex, mode of delivery, maternal and neonatal blood groups, and the onset of jaundice was recorded. Physical examination was done daily to assess clinical jaundice. Total serum bilirubin (TSB) levels were measured using a standardized laboratory method (bilirubinometer or automated analyzer) as per institutional protocol. Based on bilirubin levels and age in hours, the neonates were classified according to the American Academy of Pediatrics (AAP) guidelines for hyperbilirubinemia management.

Neonates who developed jaundice were managed as per standard clinical practices, including phototherapy or exchange transfusion where indicated. Data were 05).

compiled and analyzed using descriptive statistics. The association between risk factors and the incidence of jaundice was evaluated using chi-square tests, with a p-value of <0.05 considered statistically significant.

Results

Out of the 300 newborns included in the study, 168 (56%) developed neonatal jaundice, while 132 (44%) did not show any clinical or laboratory evidence of jaundice during the observation period. The incidence was slightly higher in male neonates (60%) compared to female neonates (40%) among the jaundiced group.

The distribution of neonatal jaundice based on gestational age revealed a higher incidence in preterm infants (65%) compared to full-term infants (52%) (Table 1). The association was statistically significant (p<0.

Table 1: Incidence of Neonatal Jaundice by Gestational Age

Gestational Age	Total Newborns	Jaundiced	Not Jaundiced	Incidence (%)
Preterm (<37 wks)	100	65	35	65%
Term (≥37 wks)	200	103	97	51.5%
Total	**300**	**168**	**132**	**56%**

ABO incompatibility was found to be a major contributing factor, present in 42 (25%) of the jaundiced neonates. Other associated risk factors included low birth weight (18%), cesarean section delivery (22%), and Rh incompatibility (5%) (Table 2).

Table 2: Risk Factors Identified in Neonates with Jaundice

Risk Factor	Number of Cases (n=168)	Percentage (%)
ABO Incompatibility	42	25%
Low Birth Weight (<2.5 kg)	30	18%
Cesarean Delivery	37	22%
Rh Incompatibility	8	5%
No Identifiable Risk	51	30%

Treatment modalities varied depending on the severity of jaundice. Among the affected neonates, 118 (70.2%) received phototherapy, 7 (4.2%) required exchange transfusion, and the remaining 43 (25.6%) were monitored conservatively without active treatment (Table 3).

Table 3: Management Strategies in Neonates with Jaundice

Treatment Method	Number of Neonates	Percentage (%)
Phototherapy	118	70.2%
Exchange Transfusion	7	4.2%
Observation Only	43	25.6%

These results indicate that neonatal jaundice was commonly observed, particularly in preterm and low birth weight infants. ABO incompatibility emerged as a significant risk factor (Table 2), and the majority of affected neonates responded well to phototherapy (Table 3).

Discussion

Neonatal jaundice continues to be one of the most common clinical findings in the neonatal period, particularly within the first week of life. In the present study, the incidence of jaundice was found to be 56%, which aligns closely with previous research indicating that approximately 50–60% of term and up to 80% of preterm neonates develop some degree of hyperbilirubinemia (1,2).

The higher incidence among preterm neonates (65%) in our study can be attributed to immature hepatic function and increased red blood cell turnover, which are known physiological contributors to jaundice in this group (3,4). Similar findings have been reported in studies conducted by Narang et al. and Trivedi et al., where preterm infants showed significantly higher bilirubin levels and earlier onset of jaundice (5,6).

Our study also identified a higher occurrence in male infants, accounting for 60% of jaundiced cases. Although the underlying cause of this gender predisposition remains unclear, other studies have observed a similar trend, suggesting possible

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hormonal or enzymatic differences influencing bilirubin metabolism (7,8).

ABO incompatibility was the most prevalent risk factor, present in 25% of affected neonates. This observation supports earlier findings which highlight ABO and Rh incompatibility as leading causes of hemolytic jaundice in neonates (9,10). Moreover, cesarean section deliveries were associated with a higher incidence of jaundice (22%), likely due to delayed initiation of breastfeeding and reduced gastrointestinal motility in these neonates, both of which contribute to delayed bilirubin excretion (11,12).

Phototherapy remains the cornerstone of treatment for neonatal jaundice and was administered in over 70% of affected neonates in this study. Its efficacy in reducing serum bilirubin levels and preventing neurotoxicity is well established (13). A small proportion (4.2%) required exchange transfusion, consistent with the findings of Singh et al., who also reported the need for such intervention in severe or rapidly rising bilirubin cases (14).

Early identification of at-risk neonates is critical to reducing morbidity associated with jaundice. The implementation of universal bilirubin screening and structured follow-up has shown to significantly reduce hospital readmissions and adverse outcomes (15). Our findings reinforce the importance of routine bilirubin monitoring, especially in preterm infants, those with blood group incompatibilities, or those delivered via cesarean section.

Conclusion

Although our study was limited to a single tertiary care centre and had a restricted study period, the results provide valuable insights into the local burden and patterns of neonatal jaundice. Further multicentric studies with larger sample sizes are recommended to validate these findings and support policy development for effective neonatal screening programs.

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