**Original article:**

# Analysis of Prevalence of Neonatal Jaundice among Young Children: An Institutional Based Study

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**Abstract**

**Background:** Jaundice is a prevalent condition that necessitates medical intervention in neonates. The present study was conducted for analyzing the prevalence of neonatal jaundice among young children.

**Materials & Methods:** A total of 200 neonates underwent screening, during which comprehensive maternal demographic and clinical information was collected. The enrollment of newborns into the study was facilitated by a pre-designed proforma. Significant hyperbilirubinemia was defined based on the bilirubin levels outlined in the AAP guidelines for term neonates and Cockington's charts for preterm neonates, beyond which phototherapy, exchange transfusion, or a combination of both interventions is warranted. Clinical jaundice is characterized by a visible yellowish discoloration of the skin in newborns. The prevalence of neonatal jaundice was evaluated, and all data was recorded in a Microsoft Excel spreadsheet for comparative analysis. Statistical evaluations were performed using SPSS software.

**Results:** A total of 200 neonates were screened during the study. Neonatal jaundice was present in 47.5 percent of the neonates. Among these 95 neonates with presence of clinical jaundice, physiological jaundice was seen in 61.11 percent of the neonates. Among non-physiological causes, majority reasons were ABO incompatibility, preterm and Rh incompatibility.

**Conclusion:** Physiologic causes include majority of the cases of neonatal jaundice. Adequate screening of the neonates should be done for assessing physiologic and non-physiologic causes of neonatal jaundice.

**Key words:** Neonatal Jaundice, Young Children.

## INTRODUCTION

Jaundice is a prevalent condition that necessitates medical intervention in neonates. It is estimated that around 60% of full-term infants and 80% of preterm infants exhibit signs of jaundice within their first week of life, with approximately 10% of breastfed infants remaining jaundiced at one month of age. In the majority of cases, jaundice in infants is not indicative of any underlying pathology; this early form, referred to as 'physiological jaundice,' is typically benign. Nonetheless, there are rare pathological causes of jaundice in newborns that must be identified, as they may occur alongside physiological jaundice. Neonatal jaundice is characterized by a yellowish tint to the skin and the sclera (the white part of the eyes) in newborns, resulting from the buildup of bilirubin in the skin and mucous membranes. This condition is linked to elevated bilirubin levels in the bloodstream, a phenomenon known as hyperbilirubinaemia.[1- 3]

Breastfed infants exhibit a higher incidence of physiological jaundice during the initial week of life compared to their bottle-fed counterparts. Additionally, prolonged jaundice, defined as jaundice that lasts beyond the first 14 days, is more frequently observed in breastfed infants. While

prolonged jaundice is generally benign, it may occasionally signal the presence of serious liver conditions. The etiology of jaundice is multifactorial, encompassing factors such as blood group incompatibility (notably rhesus or ABO incompatibility), various forms of hemolysis (the breakdown of red blood cells), sepsis (infection), liver disorders, bruising, and metabolic abnormalities. A deficiency in the enzyme glucose-6-phosphate dehydrogenase can lead to significant neonatal jaundice. This deficiency is more prevalent among certain ethnic populations and tends to be hereditary.[4- 6] Hence; the present study was conducted for analyzing the prevalence of neonatal jaundice among young children.

## MATERIALS & METHODS

A total of 200 neonates underwent screening, during which comprehensive maternal demographic and clinical information was collected. The enrollment of newborns into the study was facilitated by a pre-designed proforma. Significant hyperbilirubinemia was defined based on the bilirubin levels outlined in the AAP guidelines for term neonates and Cockington's charts for preterm neonates, beyond which phototherapy, exchange transfusion, or a combination of both interventions is warranted.6, 7 Clinical jaundice is characterized by a visible yellowish discoloration of the skin in newborns. The prevalence of neonatal jaundice was evaluated, and all data was recorded in a Microsoft Excel spreadsheet for comparative analysis. Statistical evaluations were performed using SPSS software.

## RESULTS

A total of 200 neonates were screened during the study. Neonatal jaundice was present in 47.5 percent of the neonates. Among these 95 neonates with presence of clinical jaundice, physiological jaundice was seen in 61.11 percent of the neonates. Among non-physiological causes, majority reasons were ABO incompatibility, preterm and Rh incompatibility.

**Table 1: Prevalnce of neonatal jaundice**

| Neonatal jaundice | Number | Percentage |
|---|---|---|
| **Present** | 95 | 47.5 |
| **Absent** | 105 | 52.5 |
| **Total** | 200 | 100 |

**Table 2: Distribution of neonates with jaundice according to type**

| Neonatal jaundice | Number | Percentage |
|---|---|---|
| **Physiological jaundice** | 55 | 61.11 |
| **Non-physiological** | 40 | 38.89 |
| **Total** | 95 | 100 |

## DISCUSSION

Approximately 50% of full-term infants and 80% of preterm infants experience jaundice, which typically manifests between 2 to 4 days post-delivery and generally resolves on its own within 1 to 2 weeks. The condition arises from the accumulation of bilirubin in the skin, primarily due to an increase in red blood cell breakdown coupled with a decrease in bilirubin elimination. Unconjugated bilirubin poses a risk of

neurotoxicity, potentially leading to acute or chronic encephalopathy, which may result in complications such as cerebral palsy, hearing impairment, and seizures. The application of phototherapy, whether through conventional or fiberoptic lighting in a hospital setting, has been shown to effectively decrease neonatal jaundice when compared to no intervention, as indicated by serum bilirubin measurements. The administration of intravenous immunoglobulin has been effective in minimizing the necessity for exchange transfusions in high-risk infants with hemolytic hyperbilirubinemia, as well as in lowering serum bilirubin levels, reducing the need for phototherapy, and decreasing the length of hospital stays. Jaundice stands as the most prevalent condition necessitating medical intervention in newborns, with a significant proportion of infants requiring readmission to the hospital following early discharge due to this condition. Typically, jaundice appears within the first week of life and resolves within 1 to 2 weeks, often without the need for medical treatment.[7- 9] A total of 200 neonates were screened during the study. Neonatal jaundice was present in 47.5 percent of the neonates. Among these 95 neonates with presence of clinical jaundice, physiological jaundice was seen in 61.11 percent of the neonates. Among non-physiological causes, majority reasons were ABO incompatibility, preterm and Rh incompatibility.

Slusher TM et al. investigated the relationship between transcutaneous bilirubin (TcB) measurements and serum total bilirubin (STB) levels in indigenous African newborns with varying skin pigmentation, some of whom exhibited kernicterus. The study focused on jaundiced infants aged two weeks or younger. TcB measurements were obtained using the BiliChek device concurrently with blood samples for STB analysis via spectrophotometry prior to the initiation of phototherapy. Through linear regression analysis, the researchers established a strong correlation between TcB and STB measurements, yielding r values of 0.90 for Eku and 0.88 for Jos. The mean bias and imprecision of TcB compared to STB across the total population were found to be 0.5 ± 7.6 mg/dL, as determined by the Bland and Altman method. At STB levels exceeding 12 mg/dL, the correlation ($r = 0.84$) and the bias and imprecision of the measurements were only marginally less robust. Additionally, when infants were categorized based on their skin pigmentation, the correlation between TcB and STB measurements remained strong. The findings suggest that TcB measurements serve as a valuable and dependable indicator for estimating STB levels in pigmented neonates, including those with hyperbilirubinemia and kernicterus. In settings where reliable STB measurements are unavailable, the relatively straightforward and noninvasive nature of TcB measurements can play a crucial role in guiding phototherapy and exchange transfusions, thus mitigating bilirubin-induced morbidity and mortality in low-resource clinical environments.[10]

Singhal PK et al conducted an evaluation of 454 newborns diagnosed with pathological hyperbilirubinemia, finding that approximately one-third of the cases (34.6%) remained unexplained despite comprehensive investigations. A significant majority of the infants (62.5%) exhibited hyperbilirubinemia attributed to hemolytic factors. The cases were classified into three distinct categories based on four key variables: peak serum bilirubin level, age at which the peak level was reached, age at which phototherapy commenced, and the total duration of phototherapy. Group I (mild) encompassed non-hemolytic hyperbilirubinemia, including idiopathic cases, bacterial infections, intrauterine infections, and other causes. Group II (moderate) included

both hemolytic and non-hemolytic hyperbilirubinemia resulting from prematurity, oxytocin administration, and bruising or cephalhematoma. Group III (severe) consisted of hyperbilirubinemia due to hemolysis linked to blood group incompatibility between the mother and the infant, as well as G-6-PD deficiency. A total of 66 infants required to exchange blood transfusions (EBT), with 100 EBTs performed overall. Notably, the majority of infants (80.3%) necessitating exchange blood transfusion were classified in Group III. The predominant cause of hemolytic hyperbilirubinemia that required exchange blood transfusion was Rh isoimmunization, followed by G-6-PD deficiency and ABO isoimmunization.[2]

**CONCLUSION**

Physiologic causes include majority of the cases of neonatal jaundice. Adequate screening of the neonates should be done for assessing physiologic and non-physiologic causes of neonatal jaundice.

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