



CLINICO ETIOLOGICAL PROFILE OF NEONATAL HYPERBILIRUBINEMIA IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Neonatal hyperbilirubinemia is a universal problem affecting nearly 60% of term and 80% of preterm neonates during first week of life. Early discharge of healthy term newborns is a common practice because of medical, social and economic constraints, neonatal hyperbilirubinemia is a cause of readmission.

Objectives: The present study was conducted to determine the etiological factors responsible for neonatal hyperbilirubinemia in healthy term newborns.

Methods: The present study was conducted on a prospective study of 1,841 neonates delivered at Government General Hospital, Srikakulam over one year study period August 2019 to August 2020.

Serum bilirubin was estimated who had jaundice. Investigations done were serum bilirubin, complete blood picture with peripheral smear, blood grouping (ABO, Rh) of baby and mother, CRP.

Results: During study period 350 newborns were identified with jaundice. Maximum number of newborns had physiological jaundice 238(68%) where as 112(32%) had pathological jaundice. The commonest cause of pathological jaundice was found to be septicemia 53(15.14%), followed by ABO incompatibility 32(9.1%), Rh incompatibility 10(2.8%), Intracranial hemorrhage 3(0.85%), cephalhematoma 2(0.57%), hypothyroidism 1(0.28%), idiopathic 11 (3.14%).

Conclusion: Physiological jaundice is the most common cause of jaundice in newborn babies. It is important to identify and assess neonates at risk for pathological jaundice to prevent acute bilirubin encephalopathy and subsequent kernicterus.

KEYWORDS : Newborn ,Hyperbilirubinemia, jaundice.

BACKGROUND

Jaundice is the most common problem in the first week of life worldwide. It is observed in 60% of full term infants and 80% of preterm babies in the first week'. Jaundice is also the commonest reason for delayed hospital discharge and readmissions in the first week of life^{2,3}. Neonatal hyperbilirubinemia occurs due to a variety of factors. It may be physiological or pathological. Physiologic hyperbilirubinemia is seen in neonates due to multiple factors,^{4,5} such as an increased number of red cells with a shorter life span prone for hemolysis. Also, neonates have increased enterohepatic circulation due to decreased gastrointestinal tract motility during initial few days of life, causes bilirubin reabsorption. Physiologic volume restriction due to the low volumes of breast milk is also seen in neonates. Introduction of delayed cord clamping can also be a risk factor. Hemolytic disease of the newborn (HDN) is one of the common pathologic cause of hyperbilirubinemia during the early neonatal period, mostly due to Rhesus (Rh) incompatibility, ABO incompatibility, G6PD deficiency, and rarely induced by other alloimmune antibodies⁶, other causes include sepsis, asphyxia, and exposure to hemolytic agents. However, the etiology of neonatal hyperbilirubinemia may remain obscured in more than half of the cases.⁷

Bilirubin is an important antioxidant circulating in blood of new-born. Very high bilirubin levels might be toxic for central nervous system development. Severe neonatal jaundice has the potential to cause bilirubin encephalopathy (kernicterus) which can evolve into chronic and permanent neurological sequelae. Thus, survivors may suffer from severe neurological handicaps like cerebral palsy, gaze palsies and deafness. This sequelae is irreversible, but can be prevented by early diagnosis and appropriate management of neonatal

jaundice. For the management to be appropriate, identification of the etiological and risk factors is of paramount importance. The present study was conducted to assess the clinico-etiological profile of neonates admitted with jaundice in our NICU.

OBJECTIVES:

The study was conducted to evaluate the etiological factors responsible for neonatal Hyperbilirubinemia in term newborns.

METHODS:

The present study was conducted as a Prospective study of 350 term neonates admitted in NICU, Government General Hospital, Srikakulam, over one year of August 2019 to JULY 2020.

Serum bilirubin was estimated who had jaundice. The investigations done were Serum bilirubin (total, direct and indirect) complete blood picture, reticulocyte count, G6-PD estimation (qualitative), Coombs' test, peripheral smear examination, Blood group (ABO, Rh) of the mother and baby, CBC, CRP, thyroid function test.

All babies with serum bilirubin value of >15mg/dl were included in the study. General data including age, birth weight, age at detection of jaundice, breast feeding status, family history of jaundice was documented.

Inclusion Criteria :

Neonates with jaundice admitted in NICU or neonatology ward during study period, with serum bilirubin more than 15 mg/dL.

Exclusion Criteria :

1. Neonates with jaundice not admitted in NICU, attending outpatient department only. 2. Neonates with jaundice opted discharge against medical advice. 3. Preterm babies.

DISCUSSION

Neonatal jaundice is one of the most common cause of hospitalization of neonates in the first month after birth. In most cases, neonatal jaundice is transient and usually resolving at the end of the first week after birth. But when severe hyperbilirubinemia is present, there is a potential risk for acute bilirubin encephalopathy and kernicterus. This can lead to death in the first months, and infants who are still alive often suffer from mental retardation, movement and balance disorders, seizures, hearing loss at high frequencies, and speech impairment. So, timely diagnosis and treatment of neonatal jaundice are very important to prevent further complications.

Physiological jaundice was noted in 68% babies in our study and this is most common group. Normally some icterus appears on the second to third day, reaching its maximum on the second to fourth day and decreasing on the fifth to seventh days, mainly due to liver enzymes have not evolved enough. This jaundice is called physiologic jaundice. Various factors such as maternal diabetes, race, premature infant, medication use of mother, male gender, cephalohaematoma, breast feeding, weight loss, delayed stools in the baby may be correlated with physiologic jaundice⁸. Since most of these are normal physiological findings, it also increases overall contribution of physiological jaundice in cases of neonatal jaundice.

In our study we identified ABO incompatibility (9.14%) and Rh incompatibility (2.85%) as a risk factors for neonatal jaundice. Neonatal jaundice in babies with ABO incompatibility and Rh incompatibility is mainly due to hemolysis. These both are noted as a significant risk factors in many studies.^{9,10} Sepsis noted as a cause of neonatal jaundice in 15.14% babies and many studies also noted sepsis as a significant risk factor for jaundice¹¹.

Sepsis is known to cause hemolysis and hyperbilirubinemia, probably by increasing oxidative stress damaging red blood cells that are susceptible to cell injury.¹² Cephalhematoma (0.57%), intra cranial hemorrhage (0.85%), hypothyroidism (0.29%) were least common causes noted in our study. Cephalhematoma is collection of blood, mostly due to injury during delivery, commonly instrumental delivery. This is an avoidable cause. Jaundice in hypothyroidism is mainly due to polycythemia seen in such cases.

We noted 3.14% babies with idiopathic etiology. Many authors have also been unable to establish the etiology of hyperbilirubinemia in more than half of the cases in their series^{6,7}.

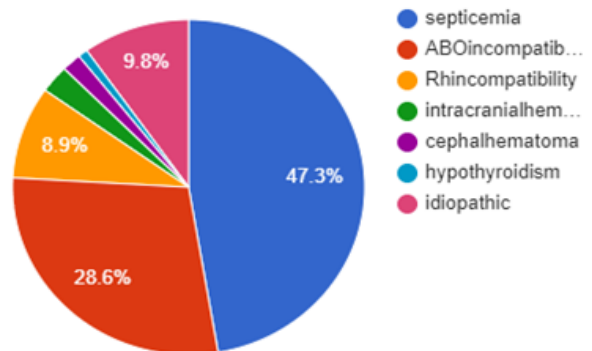
It emphasizes the need for more thorough investigations to find out the cause and further studies to determine the role of environmental factors and genetic interactions, which may exaggerate hyperbilirubinemia when associated with other high-risk conditions.

RESULTS:

A total of 350 term newborns with jaundice were studied. The maximum number of newborns had physiological jaundice 238 (68%), whereas 112 (32%) had pathological jaundice. The commonest cause of pathological jaundice was found to be septicemia 53 (15.4%), followed by ABO incompatibility 32 (9.14%), Rh incompatibility 10 (2.85%), intracranial hemorrhage 3 (0.85%), cephalhematoma 2 (0.5%), hypothyroidism 1 (0.28%), idiopathic 11 (3.14%).

Table 1: Causes Of Neonatal Hyperbilirubinemia.

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|-------------------------|-----|-------|
| Physiological jaundice | 238 | 68% |
| Pathological jaundice | 112 | 32% |
| Septicemia | 53 | 15.4% |
| ABO incompatibility | 32 | 9.14% |
| Rh incompatibility | 10 | 2.85% |
| Intracranial hemorrhage | 3 | 0.85% |
| Cephalhematoma | 2 | 0.5% |
| Hypothyroidism | 1 | 0.28% |
| Idiopathic | 11 | 3.14% |

Causes of Pathological Jaundice**Fig.1 Causes Of Pathological Jaundice.****CONCLUSION:**

Physiological jaundice is the most common cause of jaundice in newborn babies. It is essential to identify and assess neonates at risk for pathological jaundice to prevent acute bilirubin encephalopathy and subsequent kernicterus. Health care providers working with neonates play a key role in identifying and assessing neonates at risk for pathologic jaundice. Parents counselling is required for bringing their babies early to healthcare centre preventing acute bilirubin encephalopathy and subsequent kernicterus. Slightly higher incidence of septicemia than the other causes in our study may reflect the lacunae in maintaining asepsis at natal and postnatal practices in developing countries.

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