

A Study of Neonatal Hyperbilirubinemia in Mid-Western Part of Nepal

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ABSTRACT

Introduction: Neonatal hyperbilirubinemia is a common cause of hospital admissions. Serum Bilirubin depends on birth weight and gestational age. Common causes of neonatal jaundice are physiological jaundice, breast feeding/milk jaundice, prematurity and pathological causes. Surmount total serum bilirubin over critical level, crosses the blood brain barrier leading to kernicterus. Prompt identification and proper management is of great importance otherwise there is a risk of bilirubin encephalopathy. **Objectives:** To find out the prevalence and causes of neonatal jaundice in our setting and treatment modalities undertaken. **Materials and methods:** A hospital based descriptive study was done among total newborns including both inborn and out born admitted in NICU, NGMC over the period of one year. A total 288 newborns with jaundice were enrolled in the study. Data were entered in excel and analyzed in SPSS 18th version. Descriptive data were presented through pie, bar graph, and table with frequency and percentage. **Results:** Prevalence of neonatal jaundice was 31%. Causes of neonatal jaundice were physiological and pathological in 56% and 44% cases respectively. Among the pathological causes ABO incompatibility was the most common cause seen in 11.4% cases followed by sepsis seen in 8.7% cases. **Conclusions:** Phototherapy is very effective treatment modality to reduce the serum bilirubin in most of the cases neonatal hyperbilirubinemia and if the bilirubin crosses the cut off limit according to Bhutani's chart then we have to consider exchange transfusion. Appropriate management in time leads to satisfactory outcome.

Key words: Kernicterus, newborn, pathological jaundice

INTRODUCTION

Neonatal hyperbilirubinemia is a commonest abnormal physical finding during first week of life causing hospital admissions. It is a benign condition subsiding of its own in most of the cases without any treatment. It is seen in 60% and 80% of full term and preterm infants respectively during the first week of life¹. Newborns appear jaundiced when bilirubin is more than 7mg/dl². Hyperbilirubinemia is of two types, physiologic and non-physiologic. Physiologic jaundice is when the serum bilirubin is up to 12mg/dl after 24 hours up to 5th day of life and possibly not rising more than 15mg/dl. Non physiologic Jaundice is jaundice occurring within 24 hours of age, any elevation in serum bilirubin requiring phototherapy, a rise in serum bilirubin levels of more than 0.2mg/dl/hr². Surmount total serum bilirubin over critical level, crosses the blood brain barrier. So, prompt identification and proper management is of great value to prevent bilirubin encephalopathy (kernicterus)³. Serum Bilirubin depends on birth weight and gestational age^{4,5}.

Neonatal Jaundice occurs due to their higher predisposition to production of bilirubin and their limited ability of excretion.

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Newborns especially preterms produce more bilirubin because of higher turnover of RBCs due to shorter life span⁶. Common causes of neonatal jaundice are physiological jaundice, breast feeding jaundice, breast milk jaundice, prematurity, pathological causes like hemolytic disease e.g. Rh-incompatibility, ABO incompatibility, neonatal sepsis, hypothyroidism etc⁷. The present study was undertaken to find out the prevalence and causes of neonatal jaundice in our setting and treatment modalities undertaken.

MATERIALS AND METHODS

This hospital based cross-sectional descriptive study was done in the department of Pediatrics, Nepalgunj medical college, Nepalgunj from July 2016 to June 2017. A total 288 newborns with jaundice were enrolled in the study in aforementioned period of study. All babies who were presented clinically with icterus and admitted in NICU/Nursery were included in the study irrespective of any other associated diseases. Babies over 28 days were excluded. Those newborns whose parents denied providing consent were also not included in our study. Clinical examination for jaundice was done by Kramer method⁷. Van den Bergh method was used for estimation of bilirubin. Bhutani's chart⁸ was used to decide treatment modality to be given.

Detailed history including gestational age, birth weight, age at onset of jaundice, breast fed or not, family history of jaundice was taken followed by detailed physical examination. Relevant investigations such as blood grouping and Rh typing of baby and mother, Cord blood bilirubin and hemoglobin, direct coomb's test (DCT) and bilirubin monitoring was done when Rh incompatibility was suspected. Further investigations carried

out were hemoglobin, peripheral smear and reticulocyte count. G6PD and thyroid function tests were also done when indicated. In newborns with sepsis, septic workup was done. Suspected intrauterine infections were ruled out with needful tests. Data were entered in excel and analyzed in SPSS 18th version. Descriptive data were presented in pie chart and tables with frequency and percentage.

RESULTS

Total 918 newborns were admitted during the study period out of which 288 cases were of neonatal jaundice. Prevalence of neonatal jaundice was 31%. Among which 175(61%)were male and 113(39%) were female babies. Causes of neonatal jaundice are presented in table I below.

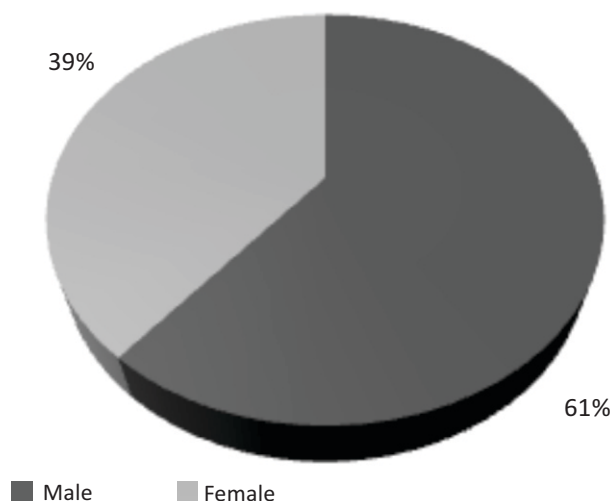


Figure 1: Sex Distribution of Newborns with Neonatal Jaundice

Term newborns were 169 (59%) and preterm were 119 (41%).

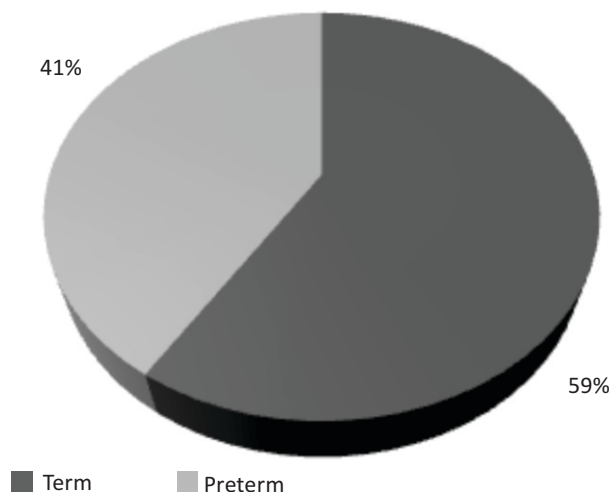


Figure 2: Distribution of Newborns according to gestational age

DISCUSSION

Our study includes 288 neonates of less than 28 days of life of which 61% were males and rest 39% were females. Several other studies have also shown such male predominance⁹⁻¹¹. The reason behind this male predominance in our part of the world may be social bias of taking care of male babies more. Prevalence of neonatal jaundice was 31% which was higher compared to other studies from Nepal medical college¹². This may be because of higher number of premature babies delivered in this mid western part of Nepal. In this study physiological jaundice was the commonest cause accounting 56% of cases. This is in accordance to other studies as well¹³⁻¹⁵. The second most common causes of neonatal jaundice in our

| Etiology | Preterm newborn No | Term newborn No | Total newborns |
|------------------------|--------------------|-----------------|-------------------|
| Physiological Jaundice | 99 (61.1%) | 63 (38.9%) | 162 (100%) |
| ABO incompatibility | 19 (57.6%) | 14 (42.4%) | 33 (100%) |
| Rh incompatibility | 4 (57.1%) | 3 (42.8%) | 7 (100%) |
| Sepsis | 16 (64%) | 9 (36%) | 25 (100%) |
| Cephalhematoma | 7 (33.3%) | 14 (66.4%) | 21 (100%) |
| G6PD | 0 (0%) | 1 (100%) | 1 (100%) |
| SGA | 20 (83.3%) | 4 (16.7%) | 24 (100%) |
| Hypothyroidism | 0 (0%) | 2 (100%) | 2 (100%) |
| Intrauterine infection | 1 (33.3%) | 2 (66.7%) | 3 (100%) |
| Breast milk infection | 1 (25%) | 3 (75%) | 4 (100%) |
| HIE | 2 (33.3%) | 4 (66.7%) | 6 (100%) |
| Total | 119 | 169 | 288 (100%) |

Table I: Distribution of Newborns According To Etiology of Neonatal Jaundice

| Causes | Phototherapy No | Exchange blood transfusion No |
|---------------------|-----------------|-------------------------------|
| ABO incompatibility | 33 (100%) | 6 (18.2%) |
| Rh incompatibility | 7 (100%) | 2 (28.6%) |
| Sepsis | 25 (100%) | 3 (12%) |
| SGA | 20 (83.3%) | 2 (10%) |
| HIE | 5 (83.3%) | 0 (0%) |
| Total | 90 | 13 |

Table II: Causes of Neonatal Jaundice requiring photo therapy and exchange blood transfusion

study was ABO incompatibility comprising of 11% of cases. This is supported by other studies also^{15,16}. Sepsis was the third cause of neonatal jaundice in our study constituting 9% of cases. Merchant et al¹⁵ found 8%, Narang et al¹⁰ found 9.6%, Valiyat et al¹² found 10% and Verma et al¹⁶ found 11.6% cases of neonatal sepsis as a cause of neonatal jaundice. Sepsis was found to be cause of neonatal jaundice in 36.36% cases in a study done at BPKIHS Dharan by Joshi et al¹⁷ cephalhematoma contributed to 7.3% of cases of neonatal jaundice this is comparable to other studies as well^{10,12}. In our study Rh incompatibility was diagnosed in 2.4% of cases which was lower as compared to other studies and higher in comparison to study done by Bajpai et al¹⁸. In our study 59% babies were pre-term and remaining 41% were term. Another study was done by Ali Ahmad et al¹⁹ also reports more pre-term babies to be cause of jaundice in Rajasthan whereas Valiyat et al¹² reported term babies more to be the cause of jaundice. The reason behind having more premature babies may be lack of education, poor socioeconomic condition and early marriage.

CONCLUSIONS

Neonatal jaundice was prevalent among 31.4% of neonates. Premature babies were higher in number (59%). Most common cause of Neonatal Jaundice was physiological jaundice followed by ABO incompatibility and sepsis. Mostly the cases of ABO incompatibility, Sepsis and SGA required phototherapy. Exchange blood transfusion required in few cases of ABO incompatibility, Rh incompatibility, sepsis and SGA.

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