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Risk Factor Assessment for Neonatal Jaundice: A Descriptive Observational Study

Authors
Dr Brijmohan Meena, Dr J N Sharma, Dr Sanjay Jain, Dr Suneeta Meena
Department of Pediatrics, Neonatal Units of SPMCHI, Zanana Hospital, Mahila and Gangori Hospital, SMS Medical College, Jaipur, Rajasthan INDIA
Corresponding Author
Dr Brijmohan Meena
A-93 Arjun Nagar Ist Tonk Phatak Jaipur (Rajasthan)
Email: *brij86mohan@gmail.com, Mob. No: - 09782230899*

Abstract
Background: *Jaundice refers to the yellowish discoloration of the skin and sclera due to accumulation of bilirubin. Neonatal jaundice is a common cause of newborn hospital admission. This study addressed the risks, characteristics and outcomes of the jaundiced newborn admitted to the hospital.*
Aims & Objectives: *To determine the risk factors of jaundice in neonates admitted in neonatal units, SMS Medical College, Jaipur.*
Subject & Method: *A Hospital based Descriptive, observational study conducted from March 2013 to April 2014. Study group included neonates admitted in the neonatology units with jaundice.*
Results: *Overall 500 newborns were investigated. Out of them 332 were male &168 were female. Of them 36.6% had gestational age <35 weeks, 22% had 35-36wks and 41.4% had ≥37 weeks. ABO &Rh incompatibility were found in 45.6% & 10.4 % respectively. Prematurity was seen in 36.6% cases. Septicemia was diagnosed among 27.8%. G6PD deficiency and hypothyroidism were found in 6 and 3 cases respectively. Birth Asphyxia was seen in 6.2 % of patients.*
Conclusion: *The study revealed that ABO incompatibility, prematurity, and sepsis were found most common risk factor for neonatal jaundice. All neonates with major risk factors should be kept in close observation in hospital. These infants after discharge should also be followed up at pre-decided time interval.*
Keywords: *ABO incompatibility, Birth asphyxia, Neonatal jaundice, Prematurity, Septicemia.*

INTRODUCTION

Neonatal jaundice is the most common clinical condition requiring evaluation and treatment in the newborn and is the common cause for hospital admission during the first week of postnatal life.

Jaundice refers to the yellowish discoloration of the skin and sclera of newborn babies that result from accumulation of bilirubin in the skin and mucus membrane. Clinically it becomes apparent when the serum bilirubin exceeds 7mg/dl and in adults exceeds 2mg/dl.[1]

Jaundice is the commonest abnormal physical finding with an incidence of about 60% in term babies and 80% in preterm babies. In preterm babies, the percentage is exceedingly high due to their physiological handicaps and other hazards of

prematurity like asphyxia, septicemia, respiratory and circulatory insufficiency. Non physiological or pathological jaundice is known to occur in 8-9% of newborns with approximately 4% after 72 hours of age.[2]

Various risk factors have been identified by different workers.

American academy of Pediatrics (AAP) lists various risk factors (major and minor) that are clinically significant and most frequently associated with an increased risk of Hyperbillirubinemia.[3]

Risk factors based approach consist of timely detection and close monitoring of these neonates to prevents brain damage and subsequent neuro-motor retardation.[2]

PATIENTS AND METHODS

This study is hospital based descriptive observation study, carried out on five hundred new borns, who were admitted to neonatal units attached to SMS Medical College, Jaipur (Rajasthan), suffering from Neonatal Jaundice during the period of March 2013 to February 2014. The exclusion criteria include More than 28 days of age and Neonates admitted in the pediatric surgical units.

Each case evaluated clinically and pre-tested performa will be filled and evaluated to find out the various clinical and laboratory risk factors. Other special investigations will be doing depending upon the clinical presentation & the report of initial investigations. Data will be analyzed by appropriate statics.

Sample size calculated as following: Expecting prematurity as a risk factor in 44% newborn with jaundice the sample size calculated 500 with allowable error 10% and CI 95%.So for study purpose 500 newborn with jaundice are included.

Ethical Considerations

All process was explained to parents or guardians of the participating new borns and written informed consent was obtained.

RESULTS

A total of 500 newborns comprising 332 males and 168 females were recruited for the study. The mean gestational age and birth weight were 35.2±3.76 weeks and 2.24 ± 0.815 kg respectively.

The characteristics of the newborns are following:-

Table 1. Quantitative characteristics of investigated new borns

Variable	Mean	SD
Gestational Age (wks)	35.2	3.76
Birth weight (kg)	2.24	0.815
Apgar Score	5.80	1.206
Hb (mg/dl)	16.87	2.523
WBC	11,173	5,337
PCV (%)	51	7.099
Reticulocyte Count	2.56	1.785
Serum Bilirubin (mg/dl)	16.59	4.316
Direct Bilirubin (mg/dl)	1.18	0.694

Qualitative characteristics of investigated new borns

Table 2. Major risk factors for Neonatal Jaundice

Variable	N	%
ABO incompatibility	228	45.6
Late Pre term (35-36 wks)	110	22.0
History of phototherapy in previous sibling	65	13
Exclusive breast feeding	55	11.0
Rh incompatibility	52	10.4
Cephalohematoma or Bruising	27	5.4
Onset within 24 hours of age	16	3.2
G6PD deficiency	6	1.2

Table 3. Minor risk factors for Neonatal Jaundice

Variable	N	%
Male gender	332	66.4
Gestational Age (37-40 wks)	207	41.4
History of jaundice in previous sibling	69	13.8
Infant of Diabetic mother	56	11.2

Table 4. Other risk factors for Neonatal Jaundice

Variable	N	%
Prematurity (<35 wks)	183	36.6
Sepsis	139	27.8
History of Oxytocin infusion in mother	71	14.2
Idiopathic	65	13.0
Birth asphyxia	31	6.2
IUGR	7	1.4
Polycythemia	5	1.0
Hypothyroidism	3	0.6

DISCUSSION

In our study population male (66.3%) were predominant with ratio of male to female 2:1. This result coincided with a study conducted in India by Anil Narang et al[4] and Heydarian F et al[5] in Iran which had 60% and 63.6 male population respectively.

ABO incompatibility (45.6%) & Prematurity (36.6%) were the most common causes of neonatal hyperbilirubinemia. Comparable results were reported by Anil Shetty et al 2014[6] from India and by Ali bulbul, Nihal Cayonu 2014[7].

Sepsis was incriminated in 27.8 % cases whereas similar studies reported sepsis as a risk factor of NNJ which ranging from 4 to 40 % cases.[4, 8, 9, 10, 11, 12]

Rh incompatibility was found in 10.4 % cases. A similar result was found in a study which contain 8.8% Rh incompatibility.[13]

In this study13% percent had no obvious cause and may be considered as idiopathic. Various reports from different countries revealed that Idiopathic Neonatal jaundice ranged between 8.8 to 53.1 percent.[5, 6, 14, 15, 8]

Only 6(1.2%) patients had G6PD deficiency is comparable with a study by Lalita Bhal et al[10] (2.9%) and Rasha Gamaleldin MD et al[13] (2.8%).

CONCLUSION

In our study ABO incompatibility, prematurity and septicemia were found to be most frequent risk factors of neonatal jaundice. Glucose-6-phosphate dehydrogenase deficiency (G6PD), TORCH, Hypothyroidism, Consanguity were found less frequently.

Thus all neonates with major risk factors should be identified and kept in close observation in hospital. These infants after discharge should also be followed up at pre- decided time interval.

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