A Clinico-Laboratory Profile of Neonatal Hyper-bilirubinemia in Term Babies at B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal

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Abstract

Introduction Neonatal jaundice is a common cause of newborn admission. Early recognition and management decreases the morbidity and mortality related to it.

Objective To assess the incidence, causes and outcome of jaundice in term babies.

Methods A retrospective study was carried out of all term Babies with neonatal jaundice in BPKIHS over the Period of two years .Cases were evaluated along with Maternal, antenatal, natal history .Cases were observed as per the principle diagnosis. Laboratory Parameters including Serum bilirubin, Hemoglobin, Reticulocyte count, Blood Grouping of Mother and baby were assessed.

Results Out of 636 total admissions in Nursery and NICU 22 of them had significant jaundice. There was male Preponderance. Septicemia and ABO incompatibility were common causes of jaundice seen in 36.36 percent and 31.8 percent of babies respectively.

Conclusion Septicemia and Blood group incompatibility were the major cause of hyperbilirubinemia. Early detection and treatment is of paramount importance.

Keywords Neonatal hyperbilurubinemia , Septicemia , ABO incompatibility

Introduction

Neonatal jaundice is a common cause of admission of newborns. Since bilirubin is potentially toxic to the central nervous system, early detection and appropriate management of neonatal jaundice is of paramount importance, especially, bilirubin even in physiological ranges may cause permanent neuronal injury. The wide variation in etiology from various studies has been documented. We therefore undertook the present study to assess the incidence, causes and outcome of different modalities of the therapy of jaundice in term babies admitted in NICU and Nursery.

Methodology

This is an uncontrolled retrospective case study. All clinically icteric term babies admitted in NICU and Nursery of B.P.K.I.H.S. from May 2000 to April 2002 irrespective of other associated illness were taken for study. Case records were evaluated for details of maternal antenatal, and natal history, mode of presentation and therapeutic interventions. Cases were grouped according to principal diagnosis. Significant Jaundice was defined as total serum bilirubin exceeding 15mg/dl or even between 5 mg/dl and 15 mg/dl within 24 hour of birth or the same persisting beyond one week of life .A complete haemogram including Reticulocyte count, blood groupings of mother and baby. Direct coomb's test, Septic Screen as per guidelines given by Philip[1] (TLC <5000/cumm band / neutrophil ratio of 0.2 or higher, positive CRP, Elevated haptoglobin level, & ESR of 15mm or more for the 1st hr) & Blood C/S were evaluated. All babies with NNJ were divided into 2 groups

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~~(A)~~ Group A – Those with TSB<= 15 mg/dl >5 mg/dl but < 24 hrs of age
(B) Group B – Those with TSB>=15 mg/dl & >24 hr of age

Results

Table: 1 Causes of *Jaundice*

Cause	Group (A)		Group (B)	
	TSB<15 mg/dl & <24 hr of age, n=2		TSB>15 mg/dl & >24 hr of age, n=20	
	no	(%)	no	(%)
Rh incompatibility	0	(0)	1	(5)
ABO incompatibility	2	(100)	5	(25)
Sepsis	0	(0)	8	(40)
Cephalhaematoma	0	(0)	1	(5)
SGA	0	(0)	2	(10)
Idiopathic	0	(0)	3	(15)

Note: Birth Asphyxia was associated with Sepsis in 1 case and with SGA in 1 case.

Table: 2 Causes of *Jaundice* needing *phototherapy* and Exchange Blood Transfusion (*EBT)*

Cause	Phototherapy	EBT
	n = 14, no (%)	n = 5, no (%)
Rh incompatibility	0 (0)	1 (20)
ABO incompatibility	4 (28.57))	2 (40)
Sepsis	5 (35.71)	2 (40)
Cephalhaematoma	1 (7.14)	0 (0)
SGA	2 (14.28)	0 (0)
Idiopathic	2 (14.28)	0 (0)

Out of a total of 636 nursery and NICU admissions (both inborn & out born) 22 (3.46%) had significant Jaundice. There was a male predominance (15 were male & 7 female) with M:F: 2.1:1. The birth weight of babies varied from1.7 kg to3.9 kg (mean 2.979+/-0.575 kg).

The mean duration of onset of jaundice was 4.09+-3.053 day (day1-15th day) peak TSB level varied from 5.4 to 28.25 mg/dl (mean 17.41+/-5.19 mg/dl) with maximum TSB>20 mg/dl in 5/22 cases (22.72%).

Mean Hb level was 13.87+/- 3.59gm/dl with a range of 8–19.4 gm/dl. Septicemia, ABO incompatibility, Rh-incompatibility were observed in 8/22(36.36%), 7/22(31.8%), 1/22(4.54%) cases respectively.

Birth Asphyxia as concomitant aggravating factors was seen in two patients. Phototherapy and exchange blood transfusion were done in 14/22(63.63%) and 5/22(22.72%) babies respectively. Death occurred in only 1 patient (4.5%) because of septicemia.

In group A, only 2 babies developed significant Jaundice, both with ABO incompatibility. In group B maximum number of babies 8/20(40%) had septicemia followed by ABO incompatibility 5/20(25%), Idiopathic jaundice 3/20(15%) and SGA 2/20(10%).

Discussion The 3.46 percent incidence of pathological *hyperbilirubinemia* (TSB>15 mg/dl) seen in present study is in compliance with other reports[2,3].

In our series 68.18 percent of those who developed pathological *hyperbilirubinemia* were males with a ratio of male to female as 2.1:1. This result coincided with that of 64.2 percent from a study conducted in India[4].

A maximal TSB of >20 mg/dl occurred in 0.78 percent of total admissions in our study. Maximal TSB of >20 mg/dl was reported as 1.5 percent & 1.32 percent of live births, respectively by earlier studies[4,5]. This difference might have been caused because of the difference in procedure which they had taken this percentage with total live births, whereas our study was restricted to NICU and Nursery admissions only.

In our study, Sepsis was incriminated in 36.36 percent cases whereas one of the similar studies reported Sepsis in 11 percent cases of *Neonotal Hyperbilirubinemia* 6.Such a substantial difference might have been caused by percentage of out born babies which was 40.9 percent in the study where aseptic precaution during delivery of baby was not undertaken properly.

Out of 22 cases, 31.8 percent and 4.5 percent had ABO incompatibility and Rh incompatibility, respectively whereas one study stated 12 percent ABO & 5.3 percent Rh

incompatibility. However, higher incidence of ABO incompatibility than Rh incompatibility as tallied with their result[6].

Out of 22 cases of NNJ, 13.6 percent were of Idiopathic in origin. Various reports from India have revealed that Idiopathic NNJ ranged between 8.8 to 57.6 percent[7,8,9].

Birth asphyxia was found to be concomitant aggravating factor in 9.097 percent cases which was very close to that of 7 percent mentioned in one study[6].

In our series 22.7 percent cases required EBT and 63.63 percent cases required phototherapy. Maximum number of exchanges was done for Septicemia 9.09 percent cases and ABO incompatibility 9.09 percent percentage of cases comprising 80 percent of total exchanges followed by Rh *isoimmunization*. Similar findings were reported earlier as well[9,10].

Conclusion

Septicaemia and blood group incompatibility were the major causes of *Hyperbilurubinemia* in our study. In our part of South Asia, infection plays a major role in mortality and morbidity associated with jaundice. So, there should be early detection followed by aggressive treatment of infections and associated jaundice. Since Birth Asphyxia is an important and critical risk factor for significant jaundice, its prevention by early stabilization of baby after birth and active monitoring of those babies for Jaundice seems to be absolutely necessary.

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