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Original research article

Incidence of Neonatal Jaundice in tertiary care hospitals - A prospective study

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Abstract:

Introduction: Neonatal jaundice is the commonest abnormal physical finding during the first week of life. Neonatal hyperbilirubinemia (NNH) is a significant cause of neonatal morbidity and prolongation of hospital stay, which in turn increases the chances of sepsis and mortality in the newborn period. Even following detailed laboratory investigations, pediatricians are often faced with a significant number of neonates with hyper bilirubinemia where exact cause remains unidentified.

Aim: To find out the prevalence of neonatal hyperbilirubinemia in babies various tertiary care medical colleges between JAN2018 to DEC2018

Materials and Methods: All the full term babies born in the three tertiary care medical college hospitals in Tamil Nadu and Kerala between, January 2018 and December 2018 were enrolled for this prospective study, after informed consent. preterm, lowbirth weight babies and who developed jaundice due to septicaemia are excluded from the study. Data was collected according to the proforma. All babies were examined in natural day light for appearance of icterus. Peripheral venous blood sample was drawn at the first appearance of significant clinical icterus according to Kramer's criteria.

Results: Total babies registerd : 32,671 babies developed neonatal jaundice 3280 Incidence of NNH is 10.7% babies in our study

Conclusion: Premature babies have much higher incidence of neonatal jaundice requiring therapeutic intervention than term newborn. Neonates with untreated, severe hyperbilirubinemia (>20mg/dL) can developed signs of acute bilirubin encephalopathy. Hence, early identification and timely intervention will save the children.

Key words: neonatal hyperbilirubinemia, physiological jaundice,NNJ,NNH

INTRODUCTION

Conventionally, neonatal hyperbilirubinemia (NNH) has been defined as bilirubin levels greater than 12.9 mg/dl in preterm babies and 15 mg/dl in term babies. Total serum bilirubin value of more than 12.9 mg/dl at any time during first week of life was considered as hyperbilirubinemia . Appropriate treatment in the form of phototherapy or exchange transfusion was given as per standard guidelines and protocols after identifying the cause.

To identify the etiological spectrum, several investigations for the baby were done: viz. Serum bilirubin,ABO, Rh typing, DCT, Reticulocyte count, hemoglobin estimation, peripheral smear, hematocrit and G-6 PD screening.

MATERIALS AND METHODS

All the full term babies born in the three tertiary care medical college hospitals in Tamil Nadu and Kerala between, January 2018 and December 2018 were enrolled for this prospective study, after informed consent. preterm, lowbirth weight babies and who developed jaundice due to septicaemia are excluded from the study. Data was collected according to the proforma. All babies were examined in natural day light for appearance of icterus. Peripheral venous blood sample was drawn at the first appearance of significant clinical icterus according to Kramer's criteria.

RESULTS

TABLE 1 Demographic detail:

Characteristics	**Category**	**Frequency**
Age (years) of mothers	Below 20	9261
	21-29	12381
	30-39	10288
	≥ 40	941
Parity	primi	19680
	multi	12991
Body Mass Index (kg/m^2)	19-25	314
	>25	695
Blood group	0	11877
	A	6177
	B	9834
	AB	4783
INCOMPATIBILITY	ABO	593
	RH	NIL
Family Type	Nuclear	30361
	Joint	2310
Family Income in rupees P M	≤ 50,000	29515
	>50,000	3156
Other Health Problems	Yes	2248
LSCS among study population	15,338	

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Characteristics	Category	Frequency
NORMAL DELIVERY	16,642	
ASSISTED DELIVERY	691	
TOTAL	32,671	

TABLE 2

Occurrence of hyperbilirubinemia in relation to mode of delivery

Mode of delivery	Babies without Hyperbilirubinemia (n=32,671) 100%	Babies with Hyperbilirubinemia (n= 3280) 10.7 %
caesarean section	15,338 (46%)	1687 (11.00%)
instrumental	691 (2.1%)	96(14.00%)
normal vaginal delivery	16,642 (57.66%)	1497 (9.00%)

Table – 3 Occurrence of hyperbilirubinemia in relation to age of mother

Age (yrs.)	Babies without Hyperbilirubinemia n=29391(100%)	Babies with Hyperbilirubinemia n=3280 (100%)
<20	9261 (31%)	877(26%)
20-29	12881(43%)	1401 (42%)
30-39	6308(21%)	903 (27%)
>40	941(3%)	99(3%)

Table – 4 Occurrence of hyperbilirubinemia in relation to maternal disease

Maternal disease	**Babies without Hyperbilirubinemia** n=29391(100%)	**Babies with Hyperbilirubinemia** N 3280(100%)
GDM	2057 (7%)	201(6%)
Hypertension	690 (2%)	89 (2%)
Hypothyroidism	765(3%)	92 (3%)
None	25879 (88%)	2898 (89%)

Table – 5Occurrence of hyperbilirubinemia in relation to type of feeding

Type of Feeding	**Babies without Hyperbilirubinemia**	**Babies with Hyperbilirubinemia**
Exclusively breast fed	25,570 (78%)	2604(79%)
Formula fed	7,101 (22%)	676(21%)

Discussion

In India, the incidence of NNH varied from 4.3% to 6.5% of all live born babies. Recently, the incidence of significant hyperbilirubinemia is documented as 10.5% in term live born babies and 25.3% in near term group. Incidence of NNH is 10.7% of all live born babies in our study. Premature babies have much higher incidence of neonatal jaundice requiring therapeutic intervention than term newborn. Neonates with untreated, severe hyper bilirubinemia (defined as serum total bilirubin level >20mg/dL) can develop signs of acute bilirubin encephalopathy. If not treated immediately, they might go on to develop Kernicterus, a chronic, neurologically devastating condition resulting from bilirubin toxicity.

We have noted that in cases of OA incompatibility, where the mother is of 'O' blood group and the baby is of 'A' blood group, the percentage of babies who develop hyperbilirubinemia is 2%. Of the cases of OB incompatibility, where the mother is of 'O' blood group and the baby is of 'B' blood group, the percentage of babies who develop hyperbilirubinemia is 3%. If we take ABO incompatibility as such, the incidence of hyperbilirubinemia is 5%.

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It is always our temptation to suspect more incidence of neonatal jaundice if mother is 'O' and baby is either 'A' or 'B'. It is interesting that, in the studies carried out in different institutions, one in the early 60's and the other in the early 70's, have shown that OA, OB and total ABO incompatibility in mother and baby pairs had higher incidence of NNH and according to those studies a baby with ABO incompatibility had 1.75 times more incidence of jaundice than the other mother and child combinations (except Rh incompatibility). Though blood group incompatibility as a group is more significantly associated with NNH in the present study, it is mostly due to incompatibility of Rh group causing jaundice. Rh incompatibility in late 80's was 9.8%. In our series, Rh incompatibility was 4.16%, which is comparable to the incidence of Rh incompatibility carried out in different institutions**.** The incidence of NNH in Rh incompatibility can only be decreased by the religious use of anti-D gamma globulin (Rho GAM) in all deliveries and miscarriages in the Rh negative mothers. In a previous study from one hospital, the non ABO, non Rh group played a significant contribution towards causation of jaundice. In the present study, in 32% of cases of NNH there was no ABO or Rh incompatibility and we could not correlate other confounding factors. Therefore, maternal blood group other than Rh negative, cannot give us a sufficient signal whether jaundice would occur in their babies or not. Though maternal age, parity, use of OCP at the time of conception and maternal disease played a predictive role in causation of NNH in certain studies, the present study does not show any statistically significant evidence that these factors may play a role in NNH. Malnourished mother and mothers from poorer background with lower per capita income may be at higher risk of neonatal hyperbilirubinemia. However, the present study has conclusively proved that there is no statistically significant association of per capita income and nutritional status of mother with NNH and maternal malnutrition may be blamed for IUGR but cannot be blamed for higher incidence of NNH.

CONCLUSION

All the maternal factors included in this study could not clearly predict the incidence of NNH which continues to be a barrier against early discharge of normal newborn babies.

Blood group incompatibility as a whole is associated with increased incidence of hyperbilirubinemia. ABO incompatibility does not have a significant impact on the incidence of NNH. Rh incompatibility is associated with increased incidence of neonatal hyperbilirubinemia. Judicious use of inj. Anti –D immunoglobulins should be emphasized in suspected cases of Rh incompatibility to prevent NNH & its neurological effects.in our study none of the case with Rh incompatibility found.Early detection of maternal risk factors also should be done to prevent the development of NNH & Kernicterus. Maternal age, mode of delivery, parity of mother, use of OCP at the time of conception, maternal disease, nutritional status of mother, type of feeding of newborn do not have any association with neonatal hyperbilirubinemia.

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