Original Article

Study of neonatal hyperbilirubinemia in babies born to 'O' positive mother

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Abstract

Problem statement: Jaundice in a neonate is one of the most vexing problems that can occur in 60% of term and 80% of preterm babies. Hyperbilirubinemia is known to be associated with significant morbidity like neonatal bilirubin encephalopathy and even death.[2] Clinical jaundice is defined as the visible manifestation of the chemical hyperbilirubinemia. It is unusual to recognise jaundice clinically until the serum bilirubin concentration exceeds 7mg/dl. **Methods:** All babies to 'O' positive mother at M.G.M. Medical College and L.S.K. Hospital were included in the study, it was prospective cohort study of 1 year, period- Nov- 2014 to Dec- 2015. **Results:** The present study enrolled 200 babies born to '0' positive group mother. Among 200 babies 120 (60%) had 'O ' positive and 80 (40%) had other than O positive babies. Cord bold sample taken from all of 200 babies to study the neonatal hyperbilirubinemia. Out of babies. 10 had cord blood bilirubin level more than 4mg/dl and total 37 (7 were preterm and 30 were term) babies developed hyperbilirubinemia which required phototherapy. Among them 10 required exchange transfusion. Two babies expired on 4th day of life, One preterm baby of A positive blood group and another term baby of O positive blood group. Both of them developed hyperbilirubinemia, received phototherapy and exchange transfusion. Both to them had culture proven sepsis. **Conclusion:** Early diagnosis and prompt management with phototherapy and exchange transfusion may save many jaundiced newborns and prevent long term sequelae in them. Hence the present study was undertaken to improve the clinical and neurological outcome of such babies with neonatal hyperbilirubinemia by appropriate therapy. Beside these, this study would also help to develop a proper protocol for future management of neonatal hyperbilirubinemia.
Keywords: Hyperbilirubinemia, cytotoxicity, Reticulocytosis, spherocytosis.

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INTRODUCTION

Approximately 20% of all pregnancies are associated with ABO-incompatibility between mother and the fetus 7and only< 10%of all these cases manifests ABO-haemolytic diseases of the newborn (ABO-HDN) clinically and almost exclusively ABO-incompatibility occurs A and B blood group of 'O' positive mothers . These babies are at high risk of severe hyperbilirubinemia (bilu. level more than 16 mg/dl).[1] ABO-HDN first described by hallbrecht (1944) and it results from the action of maternal anti-B antibodies on fetal erythrocytes of the corresponding blood group in 'O' positive mothers. Isohaemagglutinin (anti-A or Anti-B) of IgG type crosses the placenta and destroy the A or B type of RBC of the fetus.[2] Hyperbilirubinemia due to ABO-HDN is mostly in the unconjugated (indirect) form, which is non-polar, insoluble to water and transported to liver cells to bound with albumin. Bilirubin bind to albumin usually does not cross the central nervous system and is thought to be nontoxic. Some drugs like sulphonamide, free fatty acid displaces the bilirubin-albumin binding and then bilirunbin becomes toxic.[3] The diagnosis of ABO-HDN is suspected by early onset of jaundice in A or B Blood group baby of 'O' positive mother with mild splenomegaly. Anaemia is usually absent. Cord blood bilirubin estimation of more than 4 mg/dl, presence of

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maternal IgG and anti-A or anti-B antibodies, positive antibody dependant cell-mediated cytotoxicity (ADCC) assay and detection of antigen density of A or B antigens in the RBC will be suggestive of ABO-incompatibility induced hyperbilirubinemia, Reticulocytosis and spherocytosis is usually present on peripheral smear. DCT is usually negative of weakly positive[4]

METHODS

All babies born to '0' positive mothers at MGM medical college and LSK hospital were included in the study.

Study Design: Prospective cohort study of 1 yr.

Exclusion Criteria

- Babies born to mothers who suffered from jaundice 2wks prior to delivery.
- Babies who were known to suffer from congenital infection in utero.
- Babies weighing less than 1000gm

Period: One year (Nov 2014 — Dec 2015)

Sample Size: 200 babies (Total delivery in Nov 2014 – Dec 2015. Expected Positive mothers were 10%. Confidence limit was taken 95%. Descriptive study for random sampling using EPI info-6 formula).

RESULTS

The present study enrolled 200 babies born to '0' positive group mother. Among 200 babies 120 (60%) had 'O ' positive and 80 (40%) had other than O positive babies. Cord bold sample taken from all of 200 babies to study the neonatal hyperbilirubinemia. Table 1 Show the age group of mother.

Table 1: Mother's Age

Age group	Number	Percentage
< 19 Yrs	18	9%
19-30 Yrs	171	85.5%
31 Yrs	11	5.5%
Total	**200**	**100%**

Table 2: Gestational Age of Babies

Character	Number	Percentage
SGA	24	12%
AGA	172	86%
LGA	4	2%
Total	**200**	**100%**

In our study, there were 4-LGA, 24-SGA and 172-AGA babies. 198 were singleton and there was only one twin pair.

Anthropometry: Table 3 Shows the weight group of the babies.

Table 3: Birth weight of Babies

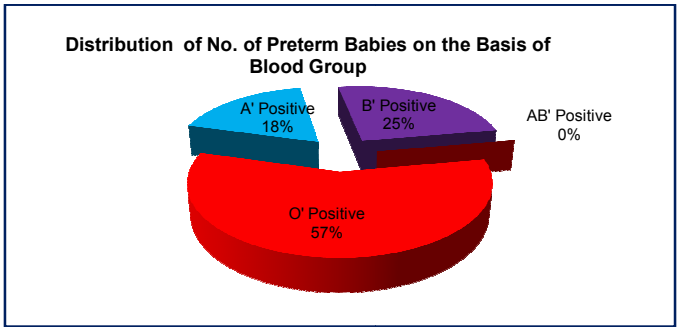
Weight group	Number	Percentage
< 1.5 kg	5	2.5%
1.6 – 2.4 kg	35	175%
>2.5 kg	160	80%
> 4 kg	0	0%
Total	**200**	**100%**

Table 4: Distribution of Blood Group with Gestational Age

Blood Group	GA			Total
	28-36 wks	37-42 wks	>42 wks	
A	5	34	-	39
AB	-	3	-	3
B	7	30	1	38
O	16	100	4	120
Total	**28**	**167**	**5**	**200**

Table 5

0 positive	A positive	B positive	AB positive
16	5	7	0



Statistical Analysis

The data was entered into MS Excel and both univariate and multivariate analysis using Chi-square test, paired comparison test, multiple correlation analysis were carried out to evaluate the significance of ABO - incompatibility. All analysis were carried out using statistical software SPSS.

CONCLUSION

Total 200 babies enrolled in the study where 28 babies were preterm. SGA babies were 12% and LGA babies were 2%. Similarly, baby's weight <1.5kg were 2.5%, 1.6-2.4kg were 17.5% and >2.5 were 80%. There were 60% '0' positive blood group babies. Maximum mothers were primigravida — 190(95%). 21 babies out of 80(26%) with ABO-incompatibility developed hyperbilirubinemia. All babies of ABO-incompatibility with hyperbilirubinemia were DCT negative. Blood group other than '0' positive babies had higher number of retic count. All 37 hyperbilirubinemic babies received phototherapy and among them 11 (30%) babies required exchange transfusion. It is well known to all paediatricians and neonatologists that 'O' positive

mothers pose an important risk for ABO-incompatibility and pathological hyperbilirubinemia in their newborns. Hence, early screening of all 'O' positive mothers and their newborns will markedly reduced the morbidity and mortality due to severe hyperbilirubinemia.

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