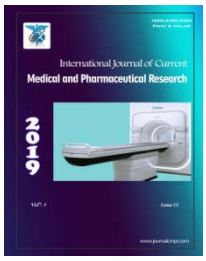
INTERNATIONAL JOURNAL OF CURRENT MEDICAL AND PHARMACEUTICAL RESEARCH
ISSN: 2395-6429, Impact Factor: 4.656
Available Online at www.journalcmpr.com
Volume 5; Issue 12(A); December 2019; Page No. 4764-4766
DOI: http://dx.doi.org/10.24327/23956429.ijcmpr201912796



Research Article

TO STUDY THE FREQUENCY OF HAEMOLYTIC DISEASE OF NEWBORN DUE TO ABO MATERNAL-FETAL INCOMPATIBILITY

Dogra Ashu[1], Singh Kalidash[2], Jasani Jasmin[3] and Hiryur PremNath[4]

[1]IHBT, and Incharge Blood Bank at SBKSMIRC Vadodra
[2]Department of Pathology SBKSMIRC, Vadodra
[3]Pathology SBKSMIRC, Vadodra
[4]IHBT SBKSMIRC, Vadodra

ARTICLE INFO

Article History:
Received 12th September, 2019
Received in revised form 23rd October, 2019
Accepted 7th November, 2019
Published online 28th December, 2019

Key words:
Hemolytic disease of newborn, Direct Antiglobulin test, ABO incompatibility.

ABSTRACT

Background: Hemolytic disease of newborn is characterized by the presence of IgG antibodies in maternal circulation, which causes hemolysis in the fetus by crossing the placenta and sensitizing red cells for destruction by macrophages in the fetal spleen with consequent hyperbilirubinemia.
Aim: Present study was done to find out Prevalence of ABO HDN in our hospital .
Material and Methods: Sample were collected after fulfilling inclusion and exclusion criteria. Samples with significant hyperbilirubinemia with rising bilirubin level on the first day more than 18 mg/dl and reticulocytosis more than 5 along with peripheral smear showing features of haemolysis with spherocytes, schistocytes ,polychromasia were taken as positive cases .The following tests were performed on each satisfactory specimen: (1). Direct Coombs test,(2) ABO Rh (3), Hemoglobin, (4) plasma bilirubin, (5) examination of peripheral smear (6) reticulocyte count.
Results: In present study a total of 100 cases were studied and out of this 31% reported ABO HDN. Out of 31 ABO incompatible neonates 22(70.97%) were males and 9(29.03%) were females. The percentage of O-A incompatible neonates were 17% , percentage of O-B incompatible neonates were 13% and1% belonged to O - AB group.
Conclusion: The estimated risk of ABO HDN among non-group –O offspring of blood group O women is 31%. Early identification of high risk neonates with ABO incompatibility, diagnosis and early intervention can reduce morbidity and mortality.

INTRODUCTION

Haemolytic disease of newborn was first described in the medical literature in 1609, when it was diagnosed in one French housewife.[1]ABO haemolytic disease of the newborn (ABO HDN) is the most common Maternal- Fetal blood group incompatibility. Unlike the Rhesus disease, it is usually a problem of the neonate rather than the Fetus. ABO HDN is restricted almost entirely to group A or B babies born to group O mothers with immune anti-A or anti-B antibodies.[2} The red cells which are sensitized by the antibodies are destroyed by macrophages in the foetal spleen with consequent hyperbilirubinemia.[3]

The spectrum of clinical problems is Haemolysis occurring in the Fetus ranging from minimal Hyperbilirubinemia to severe Anaemia with Hydrops Fetalis or Kernicterus requiring Exchange Blood transfusion. . Early detection and treatment of neonatal hyperbilirubinemia is important in prevention of Bilirubin-induced encephalopathy in the affected children.[4] Routine antenatal antibody screening tests (indirect Coombs test) do not routinely include screening for ABO HDN. Diagnosis is usually made by investigation of a newborn baby who has developed jaundice during the first day of life.

ABO haemolytic disease may affect a first pregnancy as frequently as a subsequent one, even if the blood group set-up is correct. HDN –ABO is protective against Rh immunization as anti A and anti-B antibodies which are naturally occurring in the serum of A, B or AB mother destroy incompatible foetal red cells immediately on entering to the maternal circulation.[5]. For reasons that are unclear B-O incompatibility (mother type O Baby type B) seems to be in general more severe than A-O incompatibility.

ABO HDN can occur if

1. Mother is O and Foetus is A or AB (MOST common)
2. Mother is A and Foetus is B or AB .
3. Mother is B and Foetus is A or AB.[6]

The proportionate frequency due to ABO incompatibility requiring treatment in newborns is approximately around 5% of all hyperbilirubinemias.

*Corresponding author: **Dogra Ashu**
IHBT, and Incharge Blood Bank at SBKSMIRC Vadodra

Present study included Prevalence of ABO HDN, bilirubin levels, haemoglobin levels of newborn.

MATERIAL AND METHODS

Sample were collected after fulfilling inclusion and exclusion criteria. All mothers with blood group A,B,O, WITH 37 completed gestational weeks and all full term newborns with birth weight of 2.5 kg and above were included in study. Exclusion criteria involved mothers with metabolic disorders like diabetes, high BP, preterm infants, infants with any signs n symptoms of systemic illness.

Sample for study included oxalated umbilical vein blood, obtained from infants born at Dhiraj hospital from 2015 to 2016.

A total of 100 specimens were available for examination. Samples with significant hyperbilirubinemia with rising Bilirubin level on the first day more than 18 mg/dl and reticulocytosis more than 5 along with peripheral smear showing features of haemolysis with spherocytes, schistocytes, polychromasia were taken as positive cases .The following tests were performed on each satisfactory specimen: (1). Direct Coombs test,(2) ABO Rh (3), Hemoglobin, (4) plasma bilirubin, (5) examination of peripheral smear (6) reticulocyte count.

RESULTS AND OBSERVATIONS

In present study a total of 100 cases were studied and out of this 31% reported ABO HDN. Out of 31 ABO incompatible neonates 22(70.97%) were males and 9(29.03%) were females. The percentage of O-A incompatible neonates were 17 (54%) , percentage of O-B incompatible neonates were 13(41.90%) and one (3.20%) belonged to O - AB group. (**Table 1)**. Jaundice was detected within the first 24 hours in 2 (6%)neonates and 8 (25%)neonates had anemia. The Mean initial Bilirubin levels in ABO HDN was upto. 18µmol/l. The mean initial haemoglobin was 13.2g/dl. **(Table -2).** The mean reticulocyte count was 7.1. Direct coombs test was positive in 4 (12.90%) cases. The relation of HDN to birth weight was insignificant as mean weight of ABO/HDN babies was 2.81kg compared to mean weight of ABO incompatible babies was 2.76 kg.

Table 1 Blood group wise distribution of ABO HDN.

A	B	AB
17(54%)	13(41.90%)	1 (3.20%)

Table 2 Blood- indices in ABO –HDN Cases

Indices	Values
Hemoglobin (g/dl)	13.2.
Reticulocyte count(x10^9/l)	7.1.
Bilirubin(µmol/l)	18.

DISCUSSION

The present study was a prospective and noninterventional type of study. The distribution of blood group in ABO/HDN was 17 for O-A incompatibility, 13 for O-B and 1 for O-AB incompatibility. Similar study done by Bashiru S etal in year 2011 at Akintola university found frequency of O-A incompatibility 16% and O-B incompatibility 8%. (8) A study done in india by Bhat Yr et al the proportion who were O-A and O-B incompatible were 50.4% and 49.6% respectively. Table 3.

Table 3 Distribution of Blood group O-A and O-B group with bilirubin 16-20(µmol/l) in ABO/HDN

Blood group	Present study	Bhat Yr etal[9]
A	54%	50.4%
B	41%	49.6%

ABO/HDN seen in Male infants was 70.97% and in female infants was 29.03%. This was in concordance with study done by Faris.B etal which had 68.8% males and 35.2% females. Direct coombs test was positive in 4(12.9%) cases .Negative and weak DCT was seen in studies done by Kalakheti etal .(10) Incidence of ABO/HDN WAS taken on parameters like bilirubin, haemoglobin, reticulocyte PBF and DCT.

Table 4 Shows comparison of indices in ABO/HDN group.

Table 4 comparison of indices in ABO/HDN group

Indices	Present study	Richard et al(11)	Farish B etal(12)
Hemoglobin	13.2	14.66	14
Reticulocyte	7.1	5.71	5
Bilirubin	18	3.08	>19

CONCLUSION

The estimated risk of ABO HDN among non-group –O offspring of blood group O women is 31%. Early identification of high risk neonates with ABO incompatibility, diagnosis and early intervention can reduce morbidity and mortality.

References

1. O.Simon L Toby, Walter H Dzik and others.Rossis principles of transfusion medicine.Third edition.2002.chapter 30,pageno:428.
2. Akanmu AS, Oyedeji OA, AdeyemoTA, Ogbenna A . Estimating the risk of ABO Hemolytic disease of newborn in Lagos. J Blood Transfusion,2015.E pub 2015 sep17.
3. A.G. Hadley," Laboratory assays for predicting the severity of haemolytic disease of the fetus and newborn," Transplant immunology, vol.10,n0.2-3 pp191-198,2002.
4. A.G. Hadley. Laboratory assays for predicting the severity of haemolytic disease of the fetus and newborn. Transplant Immunology,2002;10:191-198.
5. McIntosh N. The newborn;In: Forfar and Arneils Textbook of paediatrics. 5th edition.U.K. pa. churchhillivingstone,London;1998;232-233.
6. Dean Edell: ABO Incompatibility.In: General Health Encyclopedia. Adam Corn.1988;67-69.
7. Incidence,laboratory diagnosis and serologic prediction of haemolytic disease of newborn infants due to ABO incompatibility.Padiator Padol 1984;19(3):263-78.
8. Bashiru S. Oseni and Oluseun F Akomolafe. The frequency of ABO blood group maternal fetal incompatibility, maternal iso-agglutinins, and immune agglutinins quantitation in Osogbo,Osun state, south west of Nigeria Asian J Transfusion Sci.2011 Jan;5(1):46-48.
9. Bhat YR, Kumar CG. Morbidity of ABO haemolytic disease in the newborn. Paediatr Int Child Health,2012 May;32(2);93-6.
10. Kalakheti BK, Singh R, Bhatta NK, Karki A, Baral N. Risk of neonatal hyperbilirubinemia in babies born to O positive mothers: a prospective cohort study. Kathmandu univer Med J .2009 Jan-Mar;7(25):11-5.

11. Richard E. Rosenfiel A-B Hemolytic disease of the newborn A nalysis of 1480 cord blood specimens, with special references the direct antiglobulin test and to the group O mother.. Blood Journal 1955 10:17-28

12. Faris B. AL-Swarf, Rekan S. Juma. Hemolytic disease of newborn due to ABO Incompatibility. Tikrit medical journal 2009;15(2):70-78.

How to cite this article:

Dogra Ashu *et al* (2019) ' To study the frequency of haemolytic disease of newborn due to Abo maternal-fetal incompatibility', *International Journal of Current Medical and Pharmaceutical Research,* 05(12), pp 4764-4766.

****