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CASE REPORTS

# HYPERBILIRUBINEMIA DUE TO MINOR BLOOD GROUP INCOMPATIBILITY (ANTI C) IN A NEWBORN: CASE REPORT FROM A TERTIARY CARE TEACHING HOSPITAL

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**ABSTRACT**

Maternal alloantibodies against erythrocyte antigens Rh (D) usually cause clinically significant hemolysis in neonatal period. Anti-c is the next most common cause of severe HDNB after anti-D. We present In this article, a case of HDNB due to anti-c antibody incompatibility, which is a rare cause of anemia. A Preterm 35 weeks GA male baby with birth weight 2240 grams, Bilirubin total was 28.9 mg/dl, DCT was positive, Hb 10.5 gm/dl. Then minor blood group incompatibility was suspected and sent for analysis. Meanwhile baby was given ivig @1gm/kg over 6hrs. Extended Rh phenotyping turned out to be Anti-c antibody positive in mother's serum causing alloimmune hemolytic anemia in baby. Anti-c antibodies may occur due to prior exposures such as blood transfusions, abruptio placenta, spontaneous abortion, previous cesarean section. In newborns presenting with evidence of neonatal jaundice due to hemolysis not due to Rh and ABO incompatibilities, possibility of minor blood group incompatibility should be considered. There is a necessity for introduction of antibody screening for pregnant woman as a part of antenatal care in order to reduce burden of HDNB.

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**KEYWORDS**

Anti C, Neonatal Jaundice, HDNB.

## Introduction

Hemolytic disease of newborn refers to the hemolysis of neonatal erythrocytes by maternal alloantibodies. Maternal alloantibodies against erythrocyte antigens Rh (D) usually cause clinically significant hemolysis in neonatal period and its frequency has decreased with the increase in the use of anti-D gammaglobulin. Hence, the contribution of minor blood groups incompatibility other than Rh(D) antigen, such as Kell, c, C, E, e has gradually increased.[1,2] The prevalence of red cell antibodies other than anti-D with the potency to induce HDNB ( Hemolytic Disease of New Born) is about 1 in 500 pregnancies.[3] Anti-c is the next most common cause of severe HDNB after anti-D.[4] We present In this article, a case of HDNB due to anti-c antibody incompatibility, which is a rare cause of anemia.

## Case Report

A Preterm 35 weeks GA male baby with birth weight 2240 grams, born out of non consanguineous marriage, 2nd by order delivered through cesarean section in view of severe oligohydramnios. Breastfeeding was initiated within few hours of life and baby was passing urine and stools. Baby developed icterus till palms and soles within 24 hrs of life but was feeding well.There were no signs of bilirubin encephalopathy.

Initially started on Phototherapy & necessary investigations were sent. Bilirubin total was 28.9 mg/dl, DCT was positive, Hb 10.5 gm/dl, Reticulocyte count was 7% indicating hemolytic anemia with jaundice. G6PD enzyme levels were normal. Both mother and baby blood groups were B+ve. Though the bilirubin level was falling under exchange transfusion criteria, the procedure couldn't be done due to cross match incompatibility with the baby's blood.

Then minor blood group incompatibility was suspected and sent for analysis. Meanwhile baby was given ivig @1 gm/kg over 6 hrs. As the Hemoglobin has fallen to 7 gm/dl, PRBC with most possible cross match compatibility was transfused which was very difficult to obtain. Baby received triple surface intensive phototherapy for 48 hours.

Extended Rh phenotyping turned out to be Anti-c antibody positive in mother's serum causing alloimmune hemolytic anemia in baby. Later, Hemoglobin levels stabilized and bilirubin levels showed a falling trend. Baby was discharged home on Day of life-8 when active and feeding well. BERA (Brain stem Evoked Response Audiometry) was done on follow up visit and was normal. No rebound hyperbilirubinemia was found. Informed consent from parents was taken for publishing the data.

## Discussion

Traditionally RhD alloimmunization had been the most common cause of HDNB. Introduction of antiD immunoglobulin prophylaxis in both antenatal and postnatal periods had decreased the incidence of RhD alloimmunization from 14% to 2%.[5]

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Next most common cause for HDNB is ABO incompatibility. Then comes minor blood group incompatibility(kelly,duffy,C,c,E,e antigen systems). Though rare these minor blood group incompatibilities can cause severe hemolytic disease postnatally.[6,7] In newborns presenting with evidence of neonatal jaundice due to hemolysis not due to Rh and ABO incompatibilities, possibility of minor blood group incompatibility should be considered. There is a necessity for introduction of antibody screening for pregnant woman as a part of antenatal care in order to reduce burden of HDNB. Developing countries with resource limited setting need to frame universal antenatal screening guidelines in order to decrease the incidence rate.[8,9]

Anti-c antibodies may occur due to prior exposures such as blood transfusions, abruptio placenta, spontaneous abortion, previous cesarean section.[10] In our case, mother had history of blood transfusion during First pregnancy, probably when allosensitization might had occurred.

HDNB due to minor blood group incompatibility may have wide clinical presentation ranging from hydrops fetalis to subclinical hemolysis.[11] Our case had active hemolysis and hyperbilirubinemia requiring phototherapy and Intravenous immunoglobulins. DCT positivity is not directly proportional to severity of disease and is usually positive only in 30% of minor group incompatibilities.[12]

**Conclusion**

Pediatricians should consider minor blood group incompatibility while dealing with non ABO/Rh mismatch hemolytic jaundice in newborns. Universal screening for antibodies should be encouraged antenatally in order to prevent mortality and morbidity in newborns due to minor blood group incompatibility hemolytic jaundice.

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**References**

1. Özcan M, Sevinç S, Erkan VB, Yurdugül Y, Sarıcı SÜ. Hyperbilirubinemia due to minor blood group (anti-E) incompatibility in a newborn: a case report. Turk PediatriArs. 2017; 52:162-164.
2. Eder AF. Update on HDFN: new information on long-standing controversies. Immunohematology. 2006; 22:188-195.
3. Koelewijn JM, Vrijkotte TG, van der Schoot CE, Bonsel GJ, de Haas M. Effect of screening for red cell antibodies, other than anti-D, to detect hemolytic disease of the fetus and newborn: population study in the Netherlands. Transfusion. 2008; 48:941-952.
4. Geoff D, Imelda B. The Rh blood group system. In: Essential guide to blood groups. Blackwell Publishing, Amsterdam, the Netherlands, 2007; pp 33-44.
5. Roberts IA. The changing face of haemolytic disease of the newborn. Early Hum Dev. 2008; 84:515-523.
6. Thakral B, Agrawal SK, Dhawan HK, Saluja K, Dutta S, Marwaha N. First report from India of haemolytic disease of the newborn by anti c and anti E in Rh (D) positive mothers. Haematology. 2007; 12:377-380.
7. Wu KH, Chu SL, Chang JG, Shih MC, Peng CT. Haemolytic disease of the newborn due to maternal irregular antibodies in the Chinese population in Taiwan. Transfus Med. 2003;13:311-314.
8. Smith HM, Shirey RS, Thoman SK, Jackson JB. Prevalence of clinically significant red blood cell alloantibodies in pregnant women at a large tertiary-care facility. Immunohematology. 2013; 29:127-130.
9. Moinuddin I, Fletcher C, Millward P. Prevalence and specificity of clinically significant red cell alloantibodies in pregnant women - a study from a tertiary care hospital in Southeast Michigan. J Blood Med. 2019; 10:283-289.
10. Zipursky A, Bowman JM. Isoimmune hemolytic diseases. In: Nathan DG, Oski FA. Hematology of infancy and childhood. 6th ed. Vol 1. Philadelphia: WB Saunders; 2003: 44-73.
11. Liley HG. Immune hemolytic disease of the newborn. In: Nathan DG, Oski FA, (eds). Hematology of infancy and childhood. 7th ed. Vol 1. Philadelphia: WB Saunders; 2009. p. 89-92.
12. Sarici SU, Alpay F, Yeşilkaya E, Ozcan O, Gökçay E. Hemolytic disease of the newborn due to isoimmunization with anti-E antibodies: a case report. Turk J Pediatr 2002; 44: 248-50.