CASE REPORTS

# PRETERM TWINS WITH HEMOLYTIC DISEASE OF THE NEWBORN FROM RHESUS ANTI-C ANTIBODIES AFTER OOCYTE DONATION

*Kalane Shilpa, Suryawanshi Pradeep, Vaidya Umesh*

**Abstract**

Maternal sensitization with rhesus anti-C antibodies is comparatively rare and may not be benign as seen in our case report. In pregnancies conceived using donor oocytes, the mother's blood group may differ from that of both the father and the oocyte donor, making blood group incompatibility more likely. We present twins, the result of a surrogate pregnancy using donor oocytes, born with hemolytic disease due to rhesus anti-C antibodies. Both infants required intensive phototherapy. Isoimmunization in the surrogate mother was not detected antenatally.

**Keywords:** twins, hemolytic disease, Anti C antibodies.

## Introduction

Isoimmunization with anti-C antibodies is not always benign and may cause significant hemolytic disease. With the success of in vitro fertilization and oocyte donation, more infertile couples may use these methods to conceive, with or without surrogacy arrangements. In pregnancies conceived with donor oocytes, there may be a higher risk of blood group incompatibility, and special vigilance is warranted. We report case of twins, the result of a surrogate pregnancy using donor oocytes, born with hemolytic disease due to rhesus anti-C antibodies. Both infants required intensive phototherapy.

## Case Report

Male twins, the result of a surrogate pregnancy using donor oocytes, were born to 40 year old primigravida by emergency caesarean section at 30.4 weeks of gestation, due to premature onset of labor. Mother's blood group was A +ve. Antenatal investigations were normal. The twins were dichorionic diamniotic. Both had hyaline membrane disease, received early rescue surfactant treatment and were stabilized. Both were small for gestational age. Birth weight of 1st twin was 1150 gram, length was 37 cm and head circumference was 27 cm, while 2nd twin's birth weight was 1120 gram, length was 36 cm and head circumference was 26 cm. Hemoglobin in twin1 at birth was 15.5 gm/dl and in twin 2 was 16 gm/dl. Twin 1 was noticed to have jaundice at 30th hour of life and total bilirubin was 8.4 mg/dl (direct 0.9 mg/dl). Intensive light emitting diode (LED) phototherapy was given. Jaundice responded to phototherapy and was below phototherapy range (6 mg/dl) on day 5 of life, hence phototherapy was stopped. Baby had further uneventful course. Twin 2 was noticed to have jaundice at 36 hours of life and total bilirubin was 8.8 mg/dl (direct 0.96 mg/dl). Intensive LED phototherapy was given. Jaundice responded to phototherapy and was below phototherapy range (5.5mg/dl) on day 6 of life, hence phototherapy was stopped. On 11th day of life, twin 2 had increasing jaundice with pallor with hypoxia needing continuous positive airway pressure (CPAP). There was mild hepatosplenomegaly. His bilirubin increased to 10.2mg/dl (direct 0.97mg/dl) and hemoglobin was 11 gm/dl. Reticulocyte count was 10%. Septic screen was negative (white cell count was 7200/cumm, absolute neutrophil count was 2100/cumm, platelets 282000/cumm and CRP was negative). Direct Coombs test (DCT) was 3+ positive. O negative (C antigen negative) packed cell volume (PCV) transfusion was given followed by intravenous immunoglobulin (IVIG) 1 g/kg. Baby responded to treatment and bilirubin decreased to 5.6 mg/dl, so phototherapy was stopped on Day 15 of life. Though twin 1 was asymptomatic, a DCT was still done that was 4+ positive. However since baby was asymptomatic, IVIG was not given.. Both babies were detected to have anti 'C' antibody positive. Mother screened negative for the anti C antibody. In-vitro fertilization by oocyte donation was done in another state of India, hence we could not approach the surrogate mother for further investigations.

## Discussion

Rh blood group system is a complex blood group system. There are many nomenclatures and about 50 different antigen specificities. Two closely linked genes on chromosome 1 control the expression of Rh antigens. Common Rh antigens are D, c, E, C and e in order of immunogenicity. (1) Rarely no Rh antigens are expressed resulting in Rh null phenotype. Some individuals express weak D antigen (Du phenotype) which can be detected only after testing through antiglobulin phase. Rh antibodies are produced in Rh negative individuals following exposure to foreign RBCs after transfusion or pregnancy. Initially IgM antibodies are formed followed by a transition to IgG. These persist for many years. As they are IgG in nature, these can cross the placenta and may coat fetal RBCs that carry the corresponding antigen. Rh immunoglobulin is a preparation of IgG anti D given to a D negative woman during pregnancy and following delivery of a D positive fetus. It can prevent only anti D hemolytic disease of newborn. Anti-C is a rare cause of hemolytic disease of newborn and very few cases have been reported in literature. (2–4) Mitchell et al have reported one child with severe hemolytic disease of newborn twins after surrogate pregnancy by anti-C antibody after oocyte donation. (4) Both babies needed exchange transfusion. (4) However in our case, only one baby needed PCV transfusion. Baker et al has reported a case of hemolytic disease of newborn caused by anti-c antibody necessitating intrauterine transfusion. (2) Moise et al studied irregular antibodies in pregnancy and found a decreased incidence of anti Rh D and increased incidence of anti Kell-K1. (5) Koelewijn et al studied the effect of first trimesters screening program on timely detection of hemolytic disease of newborn caused by antibodies other than anti D and found that severe hemolytic disease of newborn is associated with anti K, anti C and to a lesser extent by other Rh alloantibodies. (6) Another antibody implicated

in hemolytic disease of newborn is anti Cw although rare. (7-9)

Isoimmunization with anti-C antibodies is not always benign and may cause significant hemolytic disease. Management of hyperbilirubinemia due to HDN includes monitoring serum bilirubin levels, oral hydration, and phototherapy. For infants who do not respond to conventional measures, intravenous fluid supplementation, intravenous immunoglobulin, and exchange transfusion may be used. Several clinical trials have demonstrated that intravenous immunoglobulin (IVIG) reduces the need for exchange transfusion for hyperbilirubinemia in infants with hemolytic disease caused by Rh or ABO incompatibility. (10) Limited data exist for its use in other blood group incompatibilities such as anti-C and anti-E disease. (11) With the success of in vitro fertilization and oocyte donation, more infertile couples may use these methods to conceive, with or without surrogacy arrangements. In such cases, the provision of antenatal care may become a complex matter, involving several parties, and good communication between everyone involved is vital. In pregnancies conceived with donor oocytes, there may be a higher risk of blood group incompatibility. It's difficult to predict about blood group incompatibility. However special vigilance is warranted.

The present case is being reported owing to the extreme rarity of hemolytic disease being caused by anti-C antibody. The aim is to bring out the fact that antibodies other than anti D should be considered in cases that give a suggestive history.

**Contributor Statement**

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**References :**

1. Harmening DM. Modern Blood Banking and Transfusion Practices, FA Davis Company, Philadelphia, PA, USA, 5th edition, 2005.
2. Baker JW, Harrison KL, Harvey PJ. Anti-C haemolytic disease requiring intrauterine and exchange transfusion. Med J Aust. 1981; 2: 296.
3. Trevett TN, Jr, Moise KJ., Jr Twin pregnancy complicated by severe hemolytic disease of the fetus and newborn due to anti-g and anti-C. Obstet Gynecol. 2005; 106: 1178–1180
4. Mitchell S, James A. Severe hemolytic disease from rhesus anti-C antibodies in a surrogate pregnancy after oocyte donation: a case report. J Reprod Med. 1999; 44: 388–390
5. Moise KJ Jr. Non-anti-D antibodies in red-cell alloimmunization. Eur J Obstet Gynecol Reprod Biol. 2000; 92:75–81
6. Koelewijn JM, Vrijkotte TG, Schoot CE, Bonsel GJ, Haas M. Effect of screening for red cell antibodies, other than anti-D, to detect hemolytic disease of the fetus and newborn: a population study in the Netherlands. Transfusion. 2008; 48: 941–952
7. Chu HP, Kanagalingam D, Chan DK. Severe intrauterine hemolysis due to anti-C(w). Am J Perinatol. 2007; 24: 623–626
8. May-Wewers J, Kaiser JR, Moore EK, Blackall DP. Severe neonatal hemolysis due to a maternal antibody to the low-frequency Rh antigen C (w). Am J Perinatol. 2006; 23: 213–217
9. Kollamparambil TG, Jani BR, Aldouri M, Soe A, Ducker DA. Anti-C(w) alloimmunization presenting as hydrops fetalis. Acta Paediatr. 2005; 94: 499–501
10. Louis D, More K, Oberoi S, Shah PS. Intravenous immunoglobulin in isoimmune haemolytic disease of newborn: an updated systematic review and meta-analysis. Arch Dis Child Fetal Neonatal Ed. 2014; 99: F325.
11. Wagner T, Resch B, Legler TJ, Mossier C, Helmberg W, Köhler M et al. Severe HDN due to anti-Ce that required exchange transfusion. Transfusion. 2000; 40: 571-574

**From:** Division of Neonatology, Department of Pediatrics, Sahyadri Speciality Hospital, Pune, Maharashtra, India.

**Address for Correspondence:** Dr Kalane Shilpa, Flat no. 202, G Building, Wondercity Katraz-S.N.76, Pune-46, Maharashtra, India.

**Email:** shilpauk1@gmail.com

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