CASE REPORT

Anti-M antibodies as a cause of intrauterine fetal death and neonatal hyperbilirubinaemia

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SUMMARY

A preterm male infant (35 weeks), appropriate for gestational age with birth weight of 2.20 kg was born to a 28-year G2 P0 mother. The mother's blood group was A positive and the father's was B positive. Her first pregnancy was an intrauterine fetal death due to immune hydrops. The mother's blood was positive for indirect Coomb's test with 1:32 dilution and anti-M antibodies. This pregnancy was induced at 35 weeks of gestation. Investigations from the cord blood revealed A positive blood group, positive direct Coomb's test, haematocrit of 41.4%, cord reticulocyte count of 5.3% and total serum bilirubin (TSB) of 2.7 mg/dL. Phototherapy was started at 27 h of life for visible jaundice. In view of progressive pallor and a sudden rise of bilirubin, the infant was subjected to exchange transfusion on day 5 of life. The transfusion was given with O negative and anti-M antibodies negative donor blood. Total serum bilirubin (TSB) prior to exchange transfusion was 28 mg/dL and packed cell volume (PCV) was 21%. Phototherapy was continued for a total duration of 8 days.

BACKGROUND

Antibodies with anti-M are detected in 10% of pregnant women with a positive antibody screen. It is the most frequently encountered antibody of the MNS blood group system but anti-M is rarely associated with haemolytic anaemia in the fetus or newborn. We report a case of a newborn with anti-M antibody immune haemolysis presenting with severe hyperbilirubinaemia requiring exchange transfusion and a previous sibling death due to intrauterine immune hydrops.

Prompt and early diagnosis with aggressive management would result in good outcome of these newborns.

CASE PRESENTATION

A preterm male infant (35 weeks) appropriate for gestational age with birth weight of 2.20 kg, was born to a 28-year G2 P0 mother. The mother's blood group was A positive and the father's blood group was B positive. This pregnancy was complicated by gestational diabetes mellitus which was controlled on diet. Her first pregnancy was an intrauterine fetal death due to immune hydrops. The mother's blood was positive for indirect Coomb's test (ICT) with 1:32 dilution and anti-M antibodies. In this pregnancy too, the mother's ICT was positive. Antenatal scans showed polyhydramnios (amniotic fluid index-18) but no hydrops, Doppler ultrasound of middle cerebral artery (MCA)

revealed peak systolic velocity in zone B of Marie's curve. Pregnancy was induced at 35 weeks of gestation. The baby cried immediately at birth and had Apgar's of 8/9/9 at 1, 5 and 10 min, respectively. Investigations from the cord blood revealed A positive blood group, positive direct Coomb's test (DCT), haematocrit of 41.4%, reticulocyte count of 5.3% and total serum bilirubin (TSB) of 2.7 mg/dL. On examination the infant was healthy with no pallor, no splenomegaly and was started on breastfeeding. Intensive compact fluorescent tube light phototherapy was started at 27 h of life for visible jaundice and serum bilirubin of 10.5 mg/dL. The maximum serum bilirubin increased from 13.5, 14.7 to 28 mg/dL on day 3, day 4 and day 5, respectively. The haematocrit dropped from 36.5% on day 3 to 21% on day 5. Hydration was maintained with supervised breastfeeding and weight monitoring. The weight loss on day 5 from birth was 4.6% (2.1 kg). In view of progressive pallor and the sudden rise of bilirubin, the infant was subjected to exchange transfusion on day 5 of life. The transfusion was given with O negative and anti-M antibodies negative donor blood. TSB prior to exchange transfusion was 28 mg/dL and PCV was 21%. Prior to exchange the infant also had decreased activity, hypotonia and poor Moro reflex. Phototherapy was continued for a total duration of 8 days. MRI of the brain, tone assessment, sucking and Moro reflex at discharge was normal. On follow-up at 1 and 4 months of age, brainstem evoked response audiometry was abnormal and the child was started on hearing aids.

INVESTIGATIONS

- ▶ Maximum TSB on day 5: 28 mg/dL
- ▶ Lowest haematocrit on day 5: 21%, reticulocyte on cord blood 5.3%
- ▶ Positive DCT, the baby's and mother's blood groups are A positive
- ▶ Anti-M antibodies positive

DIFFERENTIAL DIAGNOSIS

- ▶ Minor blood group incompatibility
- ▶ ABO incompatibility: no ABO setting
- ▶ Rh blood group incompatibility: the mother's blood group is A positive

TREATMENT

- ▶ Intensive phototherapy
- ▶ Exchange transfusion

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OUTCOME AND FOLLOW-UP

The baby was discharged and in follow-up was found to need hearing assessment at 5 months of age.

DISCUSSION

The MNS system is the second blood group system to be described by Landsteiner and Levine in 1927 and is 1 of the 30 blood group systems currently recognised by the International Society of Blood Transfusion (ISBT).¹ This blood group system consists of 46 antigens of which M, N, S, s antigens are commonly encountered. These antigens are expressed only on the red blood cells and are fully developed on the fetal red blood cells. Anti-M antibodies are usually cold antibodies which are not reactive at 37°C and hence generally ignored in transfusion practice.²⁻³ Anti-M also occurs naturally in individuals whose red blood cells lack the M antigen and have no history of sensitisation.⁴ Anti-M antibodies are naturally occurring antibodies which were first described by Wolff and Jonsson in 1933.⁵ They are the most frequently encountered antibodies of the MNS blood group system.⁶ Anti-M antibodies are rarely associated with intrauterine deaths/non-immune hydrops or haemolytic disease of the newborn (HDN).⁷ The index case is a rare association of anti-M antibodies with fetal hydrops and severe neonatal hyperbilirubinaemia and only few cases have been reported.^{2-3,8} Gao *et al*, reported one case of HDN and reviewed 21 cases of HDN seen by them over a period of 20 years. Mild or severe anaemia and icterus were found in all infants. A total of 11 neonates had jaundice on the first day of life. Severe jaundice with abrupt increase necessitating exchange transfusion was seen in 8 of the 22 infants.³ Young-Owens *et al* reviewed the management strategies and outcome in gravidas with anti-M isoimmunisation. They analysed 90 women who had 115 pregnancies over 26 years. Among those with positive indirect antiglobulin test, 104 pregnancies had titres at or less than 1:4. Forty of the 70 infants tested were positive for M antigen. There was no case of haemolysis of newborn, mild or severe.⁸

Learning points

- Immune haemolysis due to anti-M antibodies is a rare cause of neonatal jaundice and should be considered in all neonates with immune haemolytic jaundice not because of Rh and ABO incompatibility.
- These infants need to be monitored for sudden unexpected rise of bilirubin.
- Threshold for exchange transfusion must be kept low as there could sudden and expected rise in jaundice in these newborns.

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Competing interests None.

Patient consent Obtained.

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