Case Report

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Haemolytic Disease of Foetus and Newborn (HDFN) due to Anti c with Previous Fatal HDFN in Two Other Siblings

Transfusion Medicine Section

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ABSTRACT

Haemolytic Disease of Foetus and Newborn (HDFN) or Haemolytic Disease of Newborn (HDN) has been known to occur mostly as a result of Rh-isoimmunisation. However, HDFN due to minor antigens of the Rh system have also been reported. Anti-c causes severe HDN after anti D. Here, we report a case of HDN due to anti-c and we want to emphasise the importance of routine antibody screening as part of the antenatal services for all pregnant woman so as to prevent hazardous complications for the baby.

Keywords: Antiglobulin, Isoimmunisation, Jaundice

CASE REPORT

A 34-year-old lady with gravida 4 and para 4 presented with a history of her first baby dying one day after birth with neonatal jaundice. The second baby was normal at birth with no history of jaundice and is healthy. The third baby had a history of severe neonatal jaundice within 24 hours of life and phototherapy was instituted but baby could not be saved. The fourth child is a female presenting with jaundice since birth. On the fourth day it was admitted with complaints of yellow skin discoloration, poor feeding habits, weakness and jaundice on examination. On testing, haemoglobin was 11gm% and bilirubin was found to be 30 mg/dl. A Direct Antiglobulin Test (DAT) was found to be positive (3+). Baby's blood group found to be "O" Positive. Cold acid elution was performed with baby's cell and the antibody found was anti-c. DAT became negative. Baby's Rh phenotyping showed R1R2 (DCe/DcE) [Table/Fig-1].

Blood group of the mother was also "O" positive. Mother's antibody screening was found to be positive. Antibody identification showed presence of anti c, and confirmed by adsorption and elution methods. The mother's Rh phenotype was typed as R1R1(DCe/DCe.) [Table/Fig-1].

A minor cross-match with antigen negative blood was performed and showed compatibility. So a double volume exchange transfusion was done for the baby with antigen negative blood and bilirubin came down to 9 mg/dl after 72 hours. The follow up details are given in [Table/Fig-2].

Parameters	Pre transfusion of blood/blood product	Post transfusion	
		24 hrs	72 hrs
Haemoglobin (gm%)	11	19	18
Bilirubin (mg/dl)	30	19	9

[Table/Fig-2]: Follow up details of the case.

DISCUSSION

HDN occurs when IgG antibody from the mother crosses the placenta thereby coating and destroying red cells of the neonate and foetus. Antibodies especially to minor antigens of c and Kell of the Rh system are mostly responsible for moderate to severe haemolytic disease of newborn. Sometimes, other minor red cell antibodies may also cause severe haemolytic disease of newborn and neonate [1]. Anti-D and anti-c can cause severe disease also. Anti-C, anti-E, and anti-e can cause mild to moderate disease [2]. In a Delhi based case study, it has been reported an alloimmunisation rate of 1.25% out of which Anti-D was found to

Cell No	Probable phenotype	D	C	c	E	e	Le (a)	Le (b)	Fy (a)	Fy (b)	JK (a)	JK (b)	Sample 1	Sample 2
1	R1R1	4+	4+	0	0	4+	0	0	3+	0	0	2+	0	0
2	R1R1	4+	4+	0	0	4+	2+	0	2+	1+	1+	0	0	0
3	R1R1	4+	4+	0	0	4+	0	3+	2+	0	0	0	0	0
4	R1r	4+	4+	2+	0	4+	2+	0	0	1+	3+	1+	3+	1+
5	R2R2	4+	0	4+	4+	0	0	4+	2+	0	2+	2+	3+	1+
6	R1r	4+	4+	3+	0	3+	0	3+	2+	0	2+	0	3+	1+
7	R2r	4+	0	4+	4+	4+	0	0	0	2+	0	2+	3+	1+
8	r'r	0	4+	4+	0	4+	0	2+	1+	2+	2+	0	3+	1+
9	Rr	0	0	4+	0	4+	1+	0	0	2+	1+	1+	3+	1+
10	Rr	0	0	4+	0	4+	2+	0	2+	0	1+	3+	3+	1+
11	Rr	0	0	4+	0	4+	0	0	2+	0	2+	0	3+	1+
	Auto control												0	0

[Table/Fig-1]: Antibody identification (shows the presence of major antigens): Figure shows reaction from 4 to 11 cells, which indicate the presence of anti-c.
Sample 1: Mother antibody identification (AHG phase)
Sample 2: Baby's elute antibody identification (AHG phase)

constitute 78.43%, Anti –c about 1.96 % and the rest were C, Kell and MNS antibodies [3].

Among the non-D antibodies, anti-c was the cause of greatest neonatal morbidity as per the study by Howard H et al., [1]. Antibody screening done in most of the transfusion and antenatal centres of India is restricted to Rh negative mothers and mainly for anti D antibodies. Hence there is a chance of prolonging the diagnosis of HDN resulting due to presence of antibodies to rare antigens of the Rh system, kell, duffy, and MNS system. So, it is strongly recommended to perform routine red cell antibody screening for pregnant mothers at the first antenatal check up and, if no antibodies are detected, then periodically (i.e., once more in the third trimester between 28 and 36 weeks) [4].

Management for anti-D and anti-c isoimmunisation are same, but blood used for foetal and/or neonatal transfusion should be negative for its respective antibody. Also, individual laboratories should have their critical titres standardised [4]. A case of HDN due to anti–c was also reported by Sheeladevi CS et al., [5].

Similarly, in our case report we found anti-c in the serum of the mother that might have been sensitised during her past pregnancies. Our case is unique in that, anti c presence was missed even after three successive pregnancies with two fatal outcomes. HDN could have been prevented by a routine protocol for maternal antibody screening during the antenatal period that would have ultimately led to proper monitoring and interventions for the prevention of HDN.

CONCLUSION

Antenatal services form a major part of our healthcare system that is crucial for the proper health of the mother and also growth and development of the baby. Even though we are in the developing world, we can take a step forward and ensure that our health care system emphasise antibody screening during the antenatal period to detect high risk pregnant women candidates for HDN not only for Rh negative but also Rh positive women so as to prevent alloimmunisation of the mother thereby preventing unwanted and fatal consequences.

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