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A Case Report

HEMOLYTIC DISEASE OF NEWBORN DUE TO ALLOIMMUNISATION TO ' c ' ANTIGEN

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ABSTRACT

Among the blood group systems, Rh blood group system showing highly polymorphism and most of its antigens are highly immunogenic and can cause clinically significant hemolytic reactions, if antibodies are developed against them. In Rh system, D is highly immunogenic and one of the commonest cause of severe hemolytic disease of newborn. Other common Rh antigen in sequence of immunogenicity are c, E, C, e. Here we are reporting a case of HDN due to Anti-c.

INTRODUCTION

Among the blood group systems, Rh blood group system showing highly polymorphism and most of its antigens are highly immunogenic and can cause clinically significant hemolytic reactions, if antibodies are developed against them **(1)**. Among these D is highly immunogenic that can cause severe hemolytic disease of fetus and new born **(2)**. But, due to widespread use of Rh-D immunoglobulin, the incidences of HDN due to Anti-D are decreasing and there is relative increase in alloimmunisation due to non Rh –D antigens. **(4, 5, 6)**. Non Rh –D antigens in sequence of immunogenicity are c, E, C, e. **(3)**. Here we are reporting a case of HDN due to Anti-c.

CASE REPORT

A 26 year old female ,reg. no.20779 (G2P2A0L2), with history of first normal vaginal delivery (3 yr. before), no previous transfusion history, now delivered full term second female baby .On day second of child birth, mother and baby sample were sent to blood bank for double volume exchange transfusion with approximate requirement of 520 ml. of whole fresh blood.

On evaluation mother blood group was O positive. Baby group was also O positive and baby's sample was showing direct coomb's test positive 4+ reaction

Antibody screen was done on mother sample which was positive on 3 cell panel in 2nd and 3rd cell with 4+ reaction. Her 3 cell panel was positive for c, E, K, Jk-b, Le-a, M, and S antibodies. On further evaluation of mother's serum with 11 cell panel anti –c antibody was confirmed. On taking history father was O negative and first child having blood group O positive. Mother having phenotype CCeek- while baby having Cceek-. The baby was given O positive [CCeek] fresh whole blood approx. 520 ml for double volume exchange transfusion and recovered well.

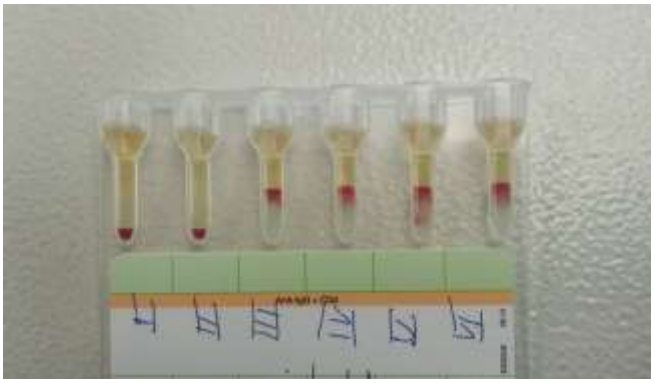

Figure 1: 11 cell panel on mother serum

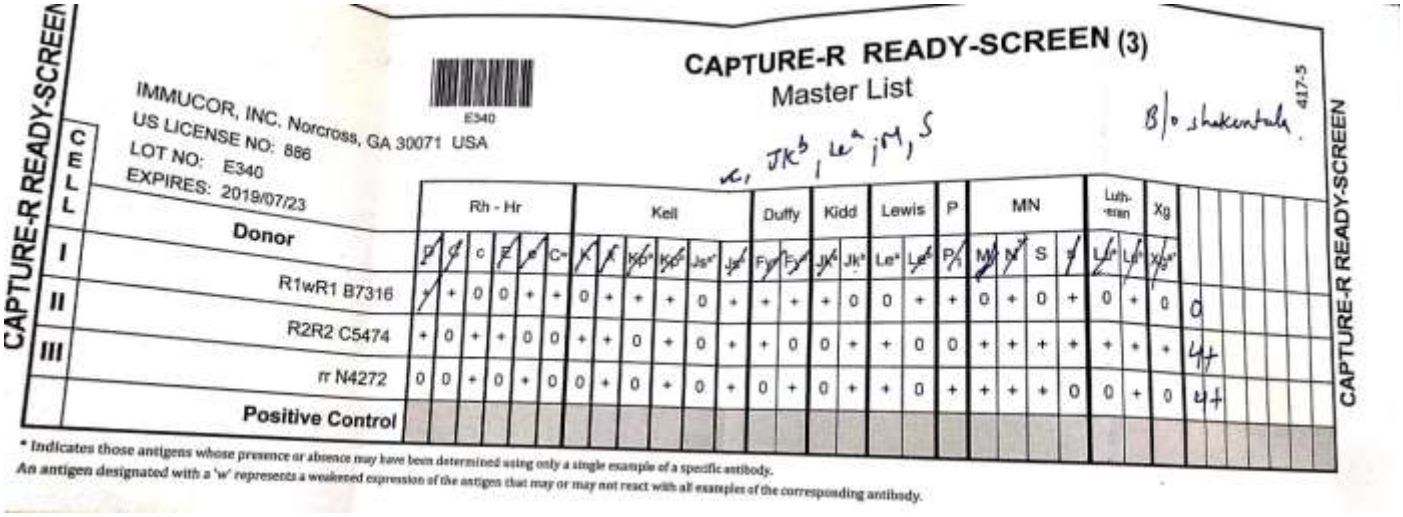

Figure 3: antigram of 3 cell panel

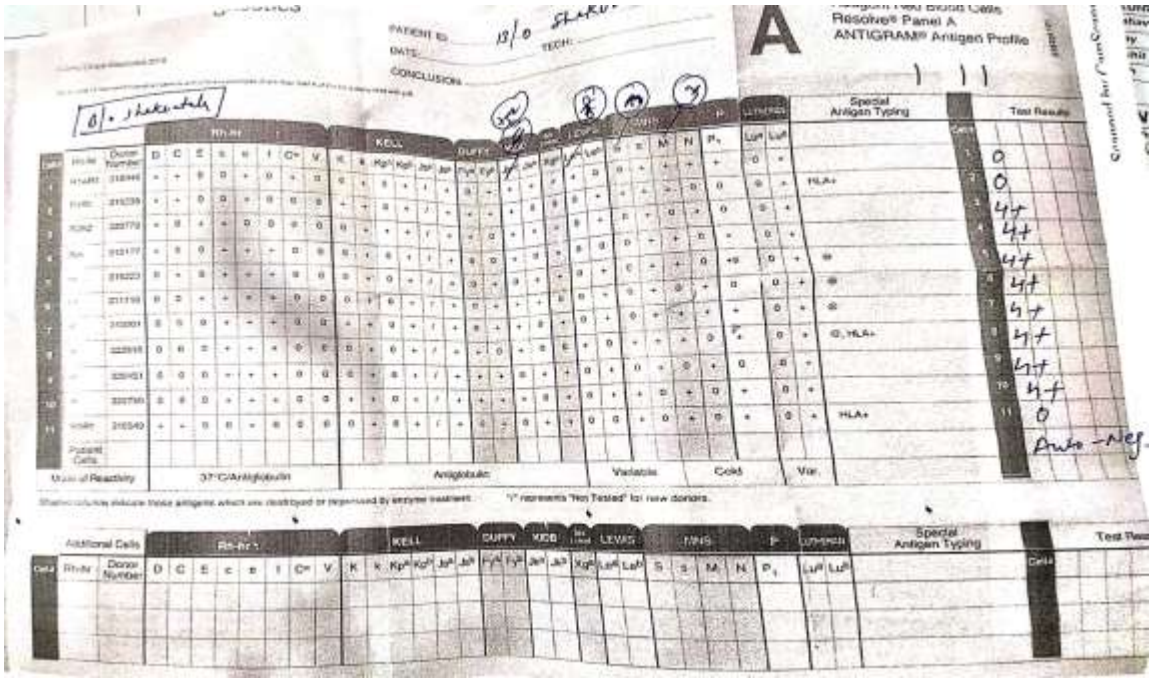

Figure 4: Antigram of 11 cell panel

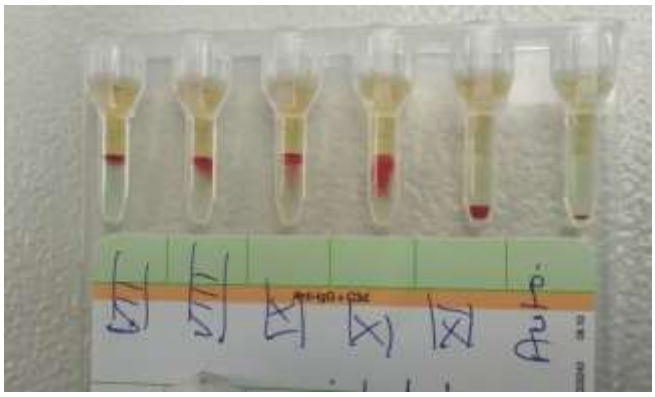

Figure 2: 11 cell panel on mother serum

DISCUSSION

Rh blood group system containing approx. 49 antigens out of which clinically significant hemolytic reaction reported against D, C, E, c and e antigens **(6)**. Most common antibodies reported was anti-E followed by anti-K and anti-C, which causes severe hemolytic reactions **(7)**. While mild HDN reported by anti-c, anti-E, and anti-e **(2)**. The first case of HDN due to anti-c antibody in Rh –D positive mother in India was published in a retrospective diagnosis made in 2007 **(8)**. Moderate

hemolytic reactions can be caused by anti-Cw and anti-Cx. **(2)**. The combination of anti-c and anti-E reported severe fetal and neonatal hemolytic disease **(4)**. In our case, sensitization to mother occur during 1st pregnancy that leads to formation of anti-c antibody. These antibodies are of IgG in nature and can cause clinically significant hemolysis of antigen presenting cells. Due to Ig G in nature, these antibodies can cross the placenta and causes destruction of fetal antigen positive cells **(1)**. Persistence of Anti-c antibody can occur up to 5 yr. after first detection **(9)**.

It is recommended that routine red cell antibody screening should be done irrespective to D positive or negative status of pregnant female that reported in ANC clinic and if no antibodies was detected, second screening should be done in 3rd trimester between 28 weeks and 36 weeks **(1)**.

Testing for irregular blood group antibodies in pregnancy is necessary for better prediction and early diagnosis of HDN.

CONCLUSION

Anti-c antibody can cause severe HDN. So every antenatal woman whether Rh positive or negative should be screened for irregular antibodies at their first appointment and if found negative repeat screen b/w 28 weeks and 34 weeks is mandatory for early diagnosis of HDN and better prognosis.

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