Delayed hemolytic transfusion reaction due to anti-D in Rh (D) positive patient

Sir,

Individuals, whose cells have a qualitative variation of the D antigen lacking one or more components of the D antigen, are said to have a partial-D phenotype. D-positive individuals harboring a "partial" D antigen may produce an allo-anti-D. We encountered a case of delayed hemolytic transfusion reaction (DHTR) due to anti-D developed in Rh (D) positive female patient.

A 57-year-old female, Para 4, from Kenya, was referred to our hospital as a case of recurrent Carcinoma left breast stage IV for 3rd line chemotherapy. She had a history of few episodes of transfusion 6 months before admission to our hospital. Historical records showed her blood group as "B-Positive."

On admission, patient's hemoglobin (Hb) was 6.6 g/dl, and she received 4 units of compatible packed red cells (PRCs) transfusion which was uneventful. After a week, another blood request was received for 2 units of PRC due to low Hb 7.0 g/dl. Patient blood group was done using automated platform (Autovue Innova™, Ortho Clinical Diagnostics, USA) and was B Rh (D) positive. Her serum was screened for irregular antibodies using commercial three cell antibody screening panel (Diacell, DiaMed, Cressier sur Morat, Switzerland) showed a positive reaction with panel I (1+) and II (2+) giving possibilities of Anti-D, C, E, Fy^a, Jk^a, Le^b antibodies. Antibody identification using ID-Diapanel (Biorad, Diamed, Cressier sur Morat, Switzerland) showed only P2 (2+) and P8 (1+) positive and was not conclusive. Routine crossmatching showed 2+ incompatibility with all 10 B Rh (D) positive units crossmatched. Polyspecific direct antiglobulin test (DAT) and auto control was 2+ positive. To rule out autoimmune etiology, elution test was performed using acid elution kit (Diacidel, Biorad Diamed, Cressier sur Morat, Switzerland). Antibody screening of eluate was positive in panel I and II with the possibility of Anti-D, C, E, Fy^a, Jk^a, Le^b Antibodies. On antibody identification Panel I, II, III, and VIII were positive and Anti-D Rh antibody was confirmed using negative exclusion in the eluate obtained from patients Red blood cells (RBCs) [Figure 1a and b].

For confirmation of Rh group, her blood group was repeated using conventional tube method using monoclonal eryclone anti-D (IgM and IgG + IgM) (Tulip Diagnostics, India), which showed 4+ reaction. B-Negative units were crossmatch compatible were transfused, and the patient was discharged with Hb 9.4 g% with stable status. On review of our records, we found that antibody screening was negative at the time of admission and all crossmatches were compatible. We also noticed that there was the inadequate rise of Hb from 6.6 to 8.0 g/dl after 4 units of transfusion which subsequently fell to 7 g/dl in week duration. However, other hemolytic investigation parameters were not available. There was no history of passive administration of anti-D.

The history of 4 PRC transfusions a week before, rapid fall of Hb, development of positive DAT with confirmation of anti-D in the eluate, incompatibility with all B-positive units and compatibility with Rh negative units confirmed DHTR. The samples were sent for partial D-confirmation and Rh genotype to a reference laboratory in South India. However, it could not be confirmed due to inadequate sample.

DHTR is defined as the posttransfusion finding of a positive DAT and a newly developed RBC alloantibody with clinical signs of hemolysis. DHTR may sometimes manifest as an inadequate rise of posttransfusion Hb level or unexplained fall in Hb after a transfusion.

Partial D has a significant implication in transfusion and pregnancy. Individuals with Partial D have missing portions of D antigen and can develop anti-D antibody if exposed to missing epitopes.[1] A case reported by Ipe *et al.* on severe hemolytic transfusion reaction in sickle cell disease was due to anti-D in a RhD positive patient.[2] Her Rh genotype revealed homozygosity for RHD*DAU4 that encodes partial D antigen.

This case highlights that some cases of partial-D can be missed during routine serological Rh testing and can lead to anti-D alloimmunization. They should be distinguished serologically by a pattern of reactivity using advance partial D typing kit or monoclonal antisera and by Rh genotyping. Therefore, an

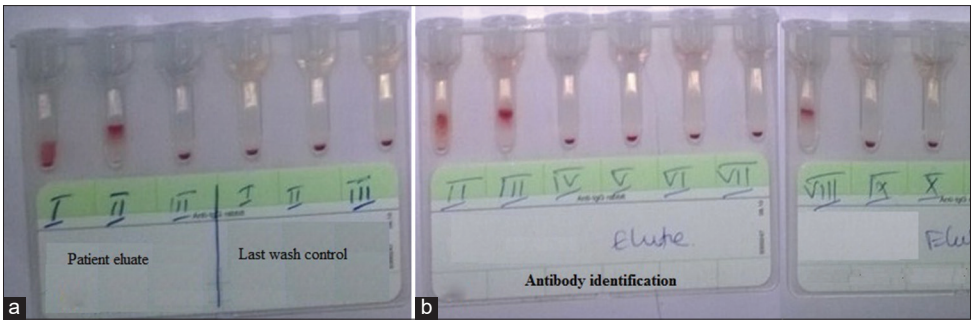

Figure 1: Patient eluate (a) antibody screening and (b) antibody identification results

accurate D-antigen identification is essential for pretransfusion and antenatal evaluation to prevent anti-D alloimmunization.

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Conflicts of interest

There are no conflicts of interest.

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