

A Rare Case of Hemolytic Anemia

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Case Report

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Abstract

Anti c is an antibody against c antigen, which is one of the minor antigens of the Rh system. Anti-c antibodies are a rare cause of autoimmune haemolytic anemia in adults. Here we present a case of an adult female who presented with anemia in failure. Blood transfusion was planned for the patient but patient's blood could not be cross matched to the major ABO blood groups. Patient was transfused with least incompatible (O negative) blood and subsequently developed features suggestive of haemolytic anemia. Direct Coombs test was positive for warm type IgG antibody and Anti-c antibody was subsequently detected to be positive.

Keywords: Hemolytic Anemia; Hypertension; Hypothyroidism; Alloantibodies; Reticulocyte

Introduction

Rhesus (Rh) blood grouping system is one of the 35 known blood grouping systems. Rh system is the second most important blood group system after ABO [1]. Rh mediated hemolytic transfusion reactions are immunoglobulin G (IgG) mediated. Anti-c Rh antibody although has been reported to cause hemolytic disease of new born. Acute Hemolytic Transfusion Reactions due to Anti-c antibody have been scarcely reported in literature.

The Rh antigens are highly immunogenic, and most of the Rh antibodies should be considered as potential causes of hemolytic transfusion reactions and Hemolytic disease of newborn. The Rh blood group contains the D antigen which differs from the C/c and E/e antigens by 35 amino acids. This large difference in amino acids is the reason why the Rh antigens are potent at stimulating an immune response. Rh antibodies rarely activate complement [2]. They bind to RBCs and mark them up for destruction in the spleen (extravascular hemolysis). Anti-D, anti-C, anti-e, and anti-c can cause severe hemolytic transfusion reactions. There are a few examples of Rh alloantibodies that are naturally occurring and are of the

IgM type, but they are in the minority. Routine blood typing for Rh D status in both blood donors and transfusion recipients has reduced the incidence of transfusion reactions caused by anti-D [3]. But sensitization to other Rh antigens can be a problem in transfusion medicine. This case report highlights one such scenario.

Case Report

A 56 Year old female, known case of T2DM, hypertension and hypothyroidism presented with the chief complaints of breathlessness since past 3 months and fever since 15 days. Physical examination revealed the presence of tachypnoea, pallor, bilateral pitting pedal oedema and bilateral basal crackles. Based on history and examination, a diagnosis of anemia in failure and Community acquired pneumonia were considered. Laboratory investigations revealed low Hemoglobin of 5.6mg/dl. Total count 16230cells/mm³ and platelet count of 2.7 lakh cells/mm³. Chest x ray showed features suggestive of bronchopneumonia. Patient was started empirical treatment for the same. Sputum culture report was awaited.

Further workup for anemia was done. Peripheral smear showed microcytic hypochromic anaemia with neutrophilic leukocytosis and no hemoparasites. Reticulocyte count was 4% (corrected reticulocyte count-1.45%). Serum iron profile done showed Serum iron 7mg/dl, TIBC 178.1 and transferrin saturation of 3.9% suggestive of iron deficiency anemia. Repeat Hb was 4.6g/dl. Blood transfusion was planned for the patient. However patient's blood could not be matched to the major ABO blood groups. ANA profile sent was negative. Further, with a suspicion of autoimmune haemolytic anemia, Direct and Indirect Coombs test was done and found to be negative. LDH was 300. Repeat Peripheral smear showed no evidence of hemolysis. Bone marrow aspiration and biopsy done and was suggestive of normal megaloblastic thyroid maturation with megakaryocytic hyperplasia. Review of previous medical records of the patient revealed that the patient had undergone a surgery 6 months ago and least incompatible blood was transfused post surgery.

Following discussion with the Department of Transfusion Medicine, it was decided to transfuse least incompatible blood group (O negative). 2 pints of pRBCs (least incompatible) were transfused to the patient under the cover of Inj. methylprednisolone and Inj. Chlorpheniramine. No transfusion reactions were

observed. Following the transfusions, patients Hb improved to 7 g/dl. However, approximately 10 days after the transfusion, patient developed fever, jaundice and hematuria. LFT done showed indirect hyperbilirubinemia (Total bilirubin-7 direct-3.3). A possibility of antibodies to non major blood antigens was thought of. Coombs test was repeated. The repeat coombs test came positive for IgG type warm antibody. So, test for antibodies to minor antigens (anti C, anti D anti E) were done. Anti c antibody was found to be positive. PNH work up was initially planned as DCT was negative but later deferred as repeat DCT was positive. Then, the patient was started on Inj. Methylprednisolone 250mg q6h. Patient's hemoglobin showed improving trend. No further blood transfusion was done. Bronchopneumonia was resolving. Liver functions being normalized. On discharge CBC -Hb-7.6, TC-8500, Plt-2.84. Patient was started on tab prednisolone 40 mg od and azathioprine 25mg od. On follow up Hb-11.1, TC-5620, Plt-2.69.

Discussion

Rh blood group system is a complex blood group system. There are about 50 different antigen specificities. The Rh locus is located on the long arm of chromosome 1 (on 1p36-p34) [4]. Genes on this chromosome control the expression of Rh antigens. Common Rh antigens are D, c, E, C and e in order of immunogenicity. Rarely no Rh antigens are expressed resulting in Rh null phenotype. Rh antibodies are produced in Rh negative individuals following exposure to foreign RBCs after transfusion or pregnancy. In the current case, inability to obtain cross matched blood lead to further investigations and detection of anti C antibodies. Anti-c, mostly IgG, is clinically the most common Rh antibody after anti-D and is reported to cause hemolytic disease of newborn and DHTR as a single or with anti-E antibody. In a study done to assess the incidence of RBC alloantibodies in Indian patients attending a tertiary care hospital, prevalence of anti c antibodies was found to be 6.4% [5].

The present case is being reported owing to the rarity of hemolytic anemia being caused by anti -C antibody. Routinely, Rh positive or Rh negative status is given only as per the presence of D antigen and minor antigens are not taken into consideration. In contrast, many developed countries routinely perform both antibody screening and extended red cell phenotyping. It is important to keep in mind that minor antigens may be a cause of haemolytic anemia especially in multi transfused patients [6]. Thus, antibody screening in selected cases helps in difficult situations to understand the underlying reason in

alloimmunised patients and also to find suitable antigen negative donor units.

References

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