Case Report

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Real eyes realizes real lies: A case report and review of nuisance antibodies in immunohematology

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Abstract:

Detection of nonspecific antibodies unrelated to blood group antigen that causes nuisance in pretransfusion testing is a rare event. Their interpretation is often made only after the exclusion of all possible clinically significant antibodies and results in the unnecessary expenditure of reagents and human resources. We report one such nuisance antibody detected in an antenatal female that showed pan reaction with antibody screening and identification panel red cells including auto control but was compatible with group-specific donor units. Direct antiglobulin test was positive with no hematological evidence of bleeding. Repeat antibody screening test performed after washing the panel red cells and use of panel cells from different manufacturer showed negative reaction raising the suspicion of antibody specificity against chemical constituents in suspension medium of panel cells. Interpretation of nonspecific antibodies as to what they really are demands extensive immunohematological work-up and causes a delay in issue of blood components to the recipient.

Keywords:

Immunohematological work up, nuisance antibodies, pretransfusion testing

Introduction

Pretransfusion testing in transfusion service plays a vital role in the detection of clinically significant antibodies and aids in the provision of the compatible unit to the recipient within the standard turnaround time.[1,2] However, antibodies unrelated to blood group antigen are sometimes encountered in routine pretransfusion testing with no well-defined serologic characterization.[3] Resolution of such cases calls for unnecessary additional immunohematological work-up and causes a delay in issue of the compatible unit to the recipient. Here, we present a case of an antenatal female with nuisance antibody that reacted only with the components of the reagent red cell suspension medium.

Case Report

We received the blood sample of a 42-year-old antenatal female posted for laparotomy in view of ruptured ectopic for pretransfusion testing. Request for two units of both packed red cells and fresh frozen plasma was raised by the clinician. Her preoperative hemoglobin was 7.4 g/dL and had no previous history of blood transfusion. Review of her obstetric history revealed one abortion and no living child.

The entire pretransfusion workup except blood grouping was performed by column agglutination technique using low ionic strength solution (LISS)/Coomb's Anti IgG + C3d gel card (Bio-Rad). On blood grouping, by automated column agglutination technique (Biovue, Ortho Clinical diagnostic USA) no ABO discrepancy was observed, and the patient

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was typed as O positive. Antibody screening with three cell panel (Bio-Rad Diamed GmBH, Switzerland) showed pan reaction of grade 1+ agglutination [Figure 1]. Direct antiglobulin test (DAT) showed grade 2+ reaction with no hematological evidence of hemolysis. However, drop in hemoglobin to 6.3 g/dL due to intraoperative blood loss was noted. Further, crossmatch with group-specific donor unit was compatible, and hence, we performed indirect antiglobulin test (IAT) with in-house pooled O cells which also showed a negative reaction. To characterize the antibody coating the red cell we performed acid elution followed by IAT of eluate against reagent red cells. It showed panreaction of grade 1+ agglutination [Figure 2]. However, we could not perform auto-adsorption in view of patient's low hemoglobin and proceeded with antibody identification using 11 cell panel (BIO-RAD Diamed GmBH, Switzerland) and it showed panreaction of grade 1+ agglutination [Figure 3]. As panreaction was observed only with reagent red cells, we repeated antibody screening test by washing the diacell panel cells and also with panel cells from a different manufacturer (surgiscreen cells, ortho clinical diagnostics). Both the tests showed negative reaction confirming the antibody specificity against suspension medium of diacell panel cells [Figures 4 and 5]. Since patient's pretransfusion sample was both DAT and autocontrol positive with no evidence of hemolysis and antibody screening and identification test became negative with washed panel cells we concluded it to be clinically insignificant warm autoantibody that is cross-reacting with suspension medium of Diacell reagent red cells.

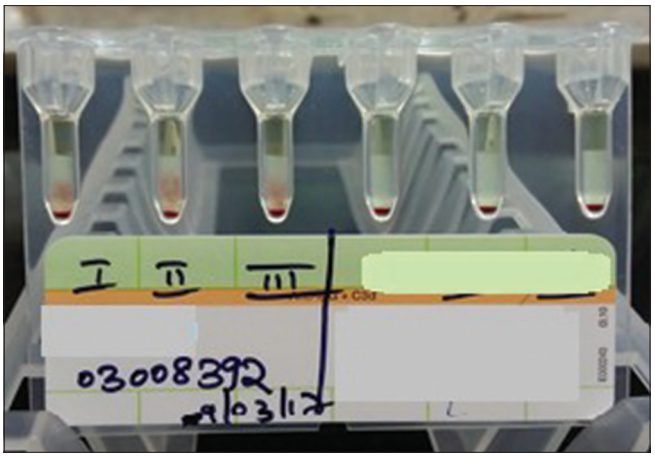

Figure 1: Antibody screening using ID - Diacell I, II III cells (Biorad)

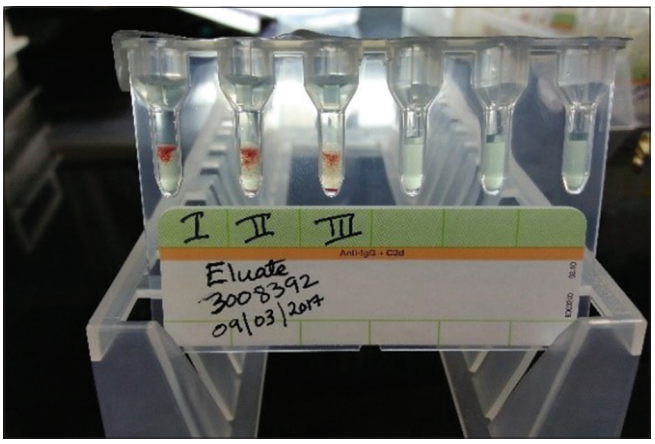

Figure 2: Antibody screening of eluate using ID - Diacell I, II, III cells (Biorad)

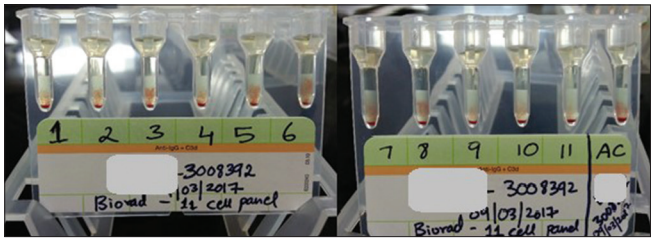

Figure 3: Antibody identification using ID-Diacell 11 cell panels (Bio-Rad)

Discussion

Detection of nonspecific antibodies in pretransfusion testing is uncommon. Their frequency and immunological characterization are not well-defined. In literature, nonspecific antibodies unrelated to blood group antigen are found to interfere in pretransfusion testing from blood grouping to antibody screening and crossmatching.[3] In our case, there was no discrepancy in blood grouping. However, pan-reactive antibody screening test and positive DAT raised the suspicion of warm autoantibody. Further, group-specific donor unit was compatible in AHG phase suggesting antibody specificity against reagent red cells. To substantiate this, antibody identification panel also showed panreactivity with no specific pattern. Fortunately, these *in vitro* serologic findings were not associated with *in vivo* hemolysis. This suggests the antibody may not be against clinically significant antigens of red cells.

Implementation of type and screen policy as a part of routine pretransfusion testing has proved beneficial in early detection of clinically significant antibodies and shortening of turn-around time for the issue of blood components.[4,5] Commercial reagent red cells used in antibody screening and identification are usually stored in buffered preservative suspension medium to maintain their functionality and cellular integrity. In our center, we use Diacell® I, II, III cells which contain modified LISS buffer, co-trimaxazole (Sulfamethoxazole + trimethoprim) and sodium azide as the suspension medium. Few manufacturers also use modified Alsever's solution containing neomycin, chloramphenicol, amphotericin-B, and hydrocortisone as the suspension medium.[6] Antibodies to these antibiotics if present in a healthy

Figure 4: Indirect antiglobulin test using washed ID- Diacell I, II, III cells (Biorad)

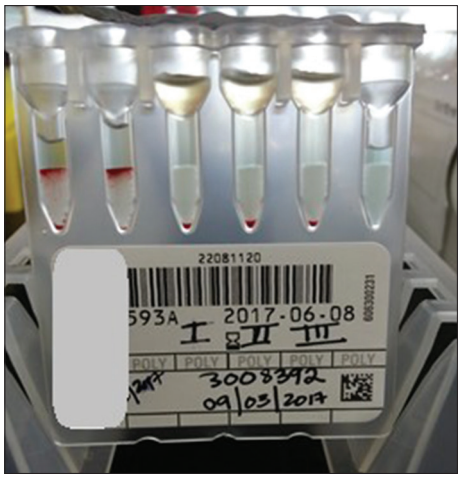

Figure 5: Indirect antiglobulin test using surgiscreen cells (Ortho clinical diagnostics)

individual may react with reagent red cell but not with donor red cells.[7,8]

Garatty has reported antibodies against chemicals in suspension medium including the sodium azide preservative. These chemicals are not covalently bound to reagent red cells and can be easily removed by washing the cells.[3] Therefore, antibodies to chemicals will react with reagent red cells only in the presence of the chemical. A similar finding was noted in our patient's sample and got resolved by washing the diacell reagent red cells and by the use of reagent red cells from a different manufacturer (ortho clinical diagnostics) containing amphotericin, neomycin sulfate and gentamycin suggesting the specificity of antibody against the suspension medium of diacell reagent red cells. However, we could not specify to which constituent of suspension medium is these antibodies are really reacting.

Pham *et al*. have reported antibodies against co-trimoxazole in commercial LISS to mimic as an antibody against a high prevalence antigen.[9] However, we ruled out this possibility as autocontrol was positive. Antibodies against commercial blood grouping antisera, various enhancement media (LISS, polyethylene glycol), and ingredients of column matrix of gel card are found in literature and are known to give an erroneous reaction in immunohematological workup.[3,10] Sometimes, these antibodies may show blood group specificity, for example, paraben in LISS additive solution that shows Jka and Rh specificity.[10,11] However, no specific pattern was observed in our antibody screening and identification test. The possibility of drug-induced antibody was ruled out from medication history and change in serologic reaction with washed reagent red cells.

Introduction of newer technologies and reagents in the field of immunohematology despite being beneficial also alerts us to anticipate the emergence of newer nonspecific antibodies that are capable of deceiving as well as time-consuming as to what they really are. Interpretation of these antibodies poses a great challenge to immunohematologists, especially in resource-limited countries.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Downes KA, Shulman IA. Pretransfusion testing. In: Fung MF, Grossman BJ, Hillyer CD, Westhoff CM, editors. Technical Manual. 18th ed. USA: AABB; 2014. p. 367.
2. Chapman JF, Elliott C, Knowles SM, Milkins CE, Poole GD. Guidelines for compatibility procedures in blood transfusion laboratories. Transfus Med 2004;14:59–73.
3. Garratty G. *In vitro* reactions with red blood cells that are not due to blood group antibodies: A review. Immunohematology 1998;14:1-1.
4. Pathak S, Chandrashekhar M, Wankhede GR. Type and screen policy in the blood bank: Is AHG cross-match still required? A study at a multispecialty corporate hospital in India. Asian J Transfus Sci 2011;5:153-6.
5. Agrawal A. Type and screen policy: Is there any compromise on blood safety? Transfus Apher Sci 2014;50:271-3.

6. Martincic I, Mastronardi C, Chung A, Ramirez-Arcos S. Unexplained agglutination of stored red blood cells in Alsever's solution caused by the gram-negative bacterium *Serratia liquefaciens*. Immunohematology 2008;24:39-44.
7. Garratty G. Problems in pre-transfusion tests related to drugs and chemicals. Am J Med Technol 1976;42:209-19.
8. Umlas J, Turner LA. Antibodies to hydrocortisone in reagent red cells causing positive antibody screening tests. Transfusion 1993;33:686-8.
9. Pham BN, Gien D, Bensaad F, Babinet J, Dubeaux I, Rouger P, *et al*. Antibodies to co-trimoxazole (trimethoprim and/or sulfamethoxazole) related to the presence of the drug in a commercial low-ionic-strength solution. Transfusion 2012;52:844-8.
10. Rajendran A, Deepthi Krishna G, Suresh B, Sreedhar Babu KV, Jothibai DS. Red cell incompatibility due to antibody against ingredient in column matrix: A rare entity. J Clin Sci Res 2016;5:40-3.
11. Judd WJ, Storry JR, Annesley TD, Reid ME, Bensette M, Waddington S, *et al*. The first example of a paraben-dependent antibody to an Rh protein. Transfusion 2001;41:371-4.