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Original Research Paper Pathology

A CASE OF CLINICALLY SIGNIFICANT ANTI-M ANTIBODY

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ABSTRACT The MNS antigen system is a human blood group system based upon two genes; glycophorin A and glycophorin B, located on chromosome number 4. There are currently 46 antigen in the system, but the five most important antigens are M,N,S,s and U. Most anti -M antibodies are naturally occurring IgM antibodies. Anti-M reacting at room temperature can be a cause of blood group discrepancy. Antibodies to Anti-M antigen are associated with hemolytic transfusion reaction if antigen reacting incompatible pack cells given.

KEYWORDS : MNS system, Anti-M antibody, alloantibody, Clinically significant, Naturally occurring

Introduction:

Anti-M antibody is a relatively common "naturally occurring" antibody first described in 1933 by Wolff & Johnson[1]. Among antibodies of MNS blood group system, anti-M is relatively common antibody[2]. Most anti-M antibodies are not active at 37°C, & therefore are not clinically significant[3]. If anti-M antibody is active at 37°C, antigen negative compatible red cells should be provided for transfusion because such anti-M antibodies may cause an acute or delayed Hemolytic Transfusion Reaction(HTR)[4]. Anti-M antibody is more common in infants than in adults[5]. Antibodies to M and N blood group antigens are associated with variable clinically significance as both IgG and IgM type of antibodies[6].

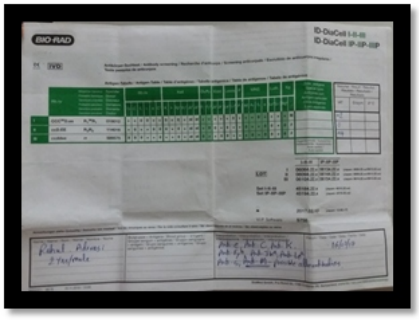
In the present case we observed an antibody reacting at 37°C in 2 years old male child.

Case detail:

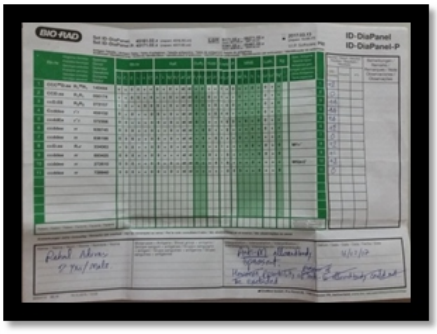
A 2 year old male child presented with neck swelling and fever since 15 days was admitted in LG general hospital Ahmedabad. He had no documented history of previous blood transfusion. Laboratory investigation included CBC, ESR and all serology. Results were within all normal range except Hemoglobin and ESR which was 6gm% & 40 mm/hr respectively at admission. Blood samples were received at our blood bank with request of 170 ml pack cell volume. Determination of blood group was done by conventional tube method. It showed forward grouping as a A positive while reverse grouping showed as O positive. To rule out technical errors we repeated with new sample but reactions were the same. To rule out positive possibility of cold antibodies ,the grouping was repeated using tube method at 4°C, Room temperature and after incubation at 37°C, but with same results. Next, we performed an antibody screen (Dia cell I.II.III -test cells DiaMed) along with an autocontrol. The auto control was negative , ruling out the possibility of an antibody. It was reported as blood group discrepancy. Further investigation like DAT and IAT were done. IAT showed positive(+2 agglutination) result and DAT showed negative (No agglutination) result. Unexpected antibodies were suspected in patient's serum. Three Cell screening panel [DiaMed GmbH,Pra Rond 23, 1785 Cresssier FR, Switzerland] revealed positive reaction +2 agglutination in panel 1st and 3rd shows +4 agglutination. There is negative(No agglutination) reaction with 2nd panel. This suggested possibility of Anti e, Anti C, Anti K, Anti Fyb, Anti JKa , Anti Lea, Anti s, Anti M antibodies.

For excat typing of these unkown antibodies blood sample was sent at department of IHBT civil hospital. Eleven cell screening panel was kept. It showed positive reaction in cell panel 1,3,4,5,6,8,9,10. It was suggestive of Anti M alloantibody specificity.

The red cells with M antigen negative compatible with patients serum in saline and AHG phase was given for transfusion.



THREE CELL SCREENING PANEL



ELEVEN CELL SCREENING PANEL

DISCUSSION:

There are approximately 30 recognized blood group systems, some of which are clinically very important. Of these, the ABO and Rh system are well understood. The MNS system (International Society of Blood Transfusion number 002) (7) is a highly complex system that has 46 antigens(8). The common antigens in this system are M, N, S, and s. The prevalence of naturally occurring anti-M antibody detectable with saline-suspended cells at room temperature in blood donors who donate routinely is 1:2,500 with M+N–cells and 1: 5,000 with M+N+ cells (9). Antibodies to M are generally not considered clinically significant because most react at low temperatures. Although it is not an uncommon antibody, studies about anti-M antibodies are sparse (mostly case reports) because of its clinical insignificance. The largest series reported was from

Severance hospital, South Korea, where 20 patients with naturally occurring anti-M antibodies were examined over 7 years (10). In blood banking, the significant antibodies are those that react at 37°C and are capable of causing HTR or hemolytic disease of the newborn. There are case reports of delayed HTR due to anti-M antibody (11). There are also case reports of anti-M antibody having a wide thermal range (12,13). In our case we also encountered anti-M antibody reacting at RT as well as at 37°C, which made it clinically significant. The nature of the antibody, whether IgM,IgG, or IgM with an IgG component, could not be determined in our case but because the reaction was seen in a wide thermal range the antibody may be an IgM with an IgG component. In the literature, 50-80% of these antibodies are considered IgG or with IgG component.(14).

Anti-M antibody is an uncommon cause of hemolytic disease of the newborn. It is recommended that, if the maternal blood has anti-M antibody, which is IgG in nature and optimally reactive at 37°C, then the father's blood must be checked for the presence of the M antigen (15). If the father's blood has the M antigen, the fetus may be at risk. There are not enough studies and guidelines in the literature outlining what titers should be considered clinically significant. After delivery, the infant's MN antigen status should be determined (15). There is one study examining the unpredictability of the dose effect by gel technology (16). In our case, we noted the clinically significant difference in reaction strength with a double dose of M as compared to a single dose. All cells with a double dose showed a +4 reaction, whereas single-dose cells (cell numbers 2, 6,and 8) showed +2 to +3 reactions. Gel technology can be as effective and error free as the tube method in detecting the dose effect in antibody identification.

CONCLUSION :

Anti M antibody is naturally occurring clinically insignificant antibody but its presence in the plasma may pose a problem in blood grouping and cross matching. The problem in blood grouping as we encountered may be an extra reaction of the reverse grouping. This issue can be resolved by repeating the reverse grouping after incubation, if the reaction will persist then an antibody screen and identification should be done to rule out a clinically significant antibody. For transfusion purpose as long as anti M antibody dose not react at 37°C , it is sufficient to issue red cell unit that are cross match compatible in the antiglobulin phase. However if the antibody reacts at 37°C cross match compatible red cells should be typed for M antigen and M antigen negative blood should be provide.

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