

Case Report

ANTI-M: REPORT OF TWO CARDIAC CASES WITH REVIEW OF LITERATURE

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ABSTRACT

Anti-M is a naturally occurring antibody reacting optimally at 4-25⁰C. Anti-M consists of Immunoglobulin M (IgM) antibody but considerable number may have IgG component. Anti-M antibody is more common in children than in adults. Most Anti-M are not active at 37⁰C and generally be ignored in transfusion practice. However, this antibody, if present in an individual, can lead to a problem in immunohematology laboratory. We report 2 cases of clinically significant anti-M antibodies that came to hospital with history of chest pain and shortness of breath and diagnosed as coronary artery disease. One case presented as cross match incompatibility and other showed discrepancy between forward and reverse ABO grouping thus creating diagnostic difficulty for blood bank staff. We reviewed the literature to find out the significance of cross-match incompatibility and blood group discrepancy.

Keywords: *Anti-M Antibody, Allo Antibody, Direct Agglutinative Test (DAT), Indirect Agglutination Test (IAT), Anti Human Globulin (AHG)*

INTRODUCTION

Anti-M is a naturally occurring, cold reactive, saline agglutinins reacting optimally at 4-25⁰C. Anti-M consists of IgM antibody but considerable number has IgG components, either alone or with IgM. Anti-M antibody is common in children than in adults. Most of Anti-M are not active at 37⁰C and can generally be ignored in transfusion practice. Anti-M is considered to be the cause of acute and delayed Hemolytic Transfusion Reactions and rarely been responsible for severe Hemolytic Disease of Fetus and Neonates. Presences of alloantibody in patients lead to difficulty in finding compatible RBC units and thus delay in issuing compatible blood (Zalpuri, 2012). The prevalence of clinically significant alloantibody in Indian literature has been reported from 0.09% to 1.4% of samples, depending on the study population and the test method sensitivity (Garg *et al.*, 2014; Makroo *et al.*, 2014; Pahuja *et al.*, 2011; Zaman *et al.*, 2014). Antibodies to M and N antigen are associated with variable clinical significance as 50-80% of anti-M are IgG or have a component of IgG (Makroo, 2014).

We report clinically significant anti-M antibodies in two cardiac cases, one presented as cross match incompatibility and other showed discrepancy between forward and reverse ABO grouping thus creating diagnostic difficulty for blood bank staff.

CASES

Case 1

A 61 year old male, non-diabetic, non hypertensive and non-smoker was admitted to hospital with complaint of chest pain and unstable angina. On coronary angiography, it was found to be Triple Vessel Disease and Coronary Artery Bypass was planned. Demand for 4 units of Packed Red Blood Cells was received in the blood bank. The blood group of patient was 'A' Rh 'D' Positive. 15 units were cross matched with gel technique and found to be incompatible. Direct agglutinative test (DAT) was found negative with negative auto control. Indirect agglutination test (IAT) was positive (4+) by Gel technique (ID micro typing system). Antibody screening was done using Low Ionic Strength Solution (LISS). Indirect Agglutination Test screening with 3 cell panel showed positive reaction in AHG phase and at room temperature. Antibody identification was done using 11 cell panels (Bio-Rad, ID Micro Typing system) which identified anti-M with dosage effect. An extended phenotype of patient showed antigen – M negative.

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Case 2

A 62 years female, non-hypertensive, hypothyroid, Type II diabetes mellitus admitted to the hospital with complaints of shortness of breath, dry cough and restlessness. Coronary Angiography diagnosed her of Triple Vessel Disease. She had a past history of carcinoma right breast for which mastectomy was done 18 yrs back but no history of blood transfusion. On admission, ABO grouping was performed. Blood cell grouping showed 'A' Rh D positive phenotype but serum grouping showed positive reaction with all the three cells; A-cells, B-cells and O-cells with immediate spin, at room temperature and at 4⁰C. At 37⁰C, there was 1+/mixed field reactions in A- cells and O- cells and 3+ reactions in B-cells. Advance investigations showed negative Direct Agglutination Test (Poly Specific) with negative auto control in AHG phase. On Antibody screening by 4 cells panel by Solid-Phase Red Cell Adherence (SPRCA, Immucor), most suspected antibodies were D, C, E, Le^a, M, S, Fy^a and JK^b. Antibody identification by 11 cell panels using positive and negative antigen for C, E, M and S cell suggested the presence of cold autoantibody and "anti-M" alloantibody which were interfering in the reverse grouping resulting in enhanced reactivity at room temperature and at 4⁰C.

DISCUSSION

Anti-M antibodies are usually naturally occurring, cold reactive and clinically insignificant antibodies. Majority of antibodies are IgM antibodies but IgG component may co-exist alone or in combination. The frequency of anti-M in routine blood donors is 1 in 2500 to 5000 (Kleen and Anstee, 2015). Few series report prevalence of anti-M antibodies in Indian population in the range of 2.5% to 8.22% (Makroo *et al.*, 2014; Pahuja *et al.*, 2011; Zaman *et al.*, 2014). Because of rarity of these antibodies, there are many Indian case reports about clinically significant anti-M antibodies in children, antenatal patients and among healthy donors (Mathur *et al.*, 2011; Tondon *et al.*, 2008; Jain *et al.*, 2015; Das *et al.*, 2013). To the best of our knowledge, this is the first Indian report of anti-M antibodies in two cardiac cases that were diagnosed as having Triple Vessel Disease. Both these cases were having blood group as 'A' positive; the first case showed the dosage effect, a finding similarly observed by Khalid *et al.*, (2011) who also had the diagnostic difficulty in a patient having blood group as 'A' positive and on further investigations, it was found to be anti-M with dosage effect. Although clinically significant anti-M antibodies are rare, it is extremely important to carefully interpret the results of blood grouping and pre-transfusion testing as there has been cases reported in literature where anti-M antibody caused delayed hemolytic reactions (Sancho *et al.*, 1998; Alperin *et al.*, 1983; Furlong and Monaghan, 1981) and hemolytic disease of newborns (Duguid *et al.*, 1995; Furukawa *et al.*, 1993 and Kanra *et al.*, 1996). Thus, it is suggested that any discrepant blood grouping and cross-match incompatibility should not be released without resolution and confirmation. It is also recommended that all patients requiring blood transfusions should be screened for presence of allo-antibodies and it should be included in pre-transfusion testing protocol so that compatible, antigen-negative blood products can be provided to prevent adverse transfusion reactions.

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