**Case Report**

**Patient with rare blood group B(A) phenotype: A case report**

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**Introduction**

The ABO blood group system plays a crucial role in transfusion and transplantation practices [1]. Correct identification of ABO blood group in blood donors and transfusion recipients is paramount importance for compatible transfusion of red blood cells because of minor errors can lead to fatal transfusion reactions [2,3]. Serological methods are routinely used to determine the antigens of ABO blood group system and iso-agglutinin in serum. Weak expression of A, B and H antigens on the red cell surface are often inherited or acquired. They are probably the least frequently encountered and pose a challenge in the routine immune-hematology practice [4]. In B(A) phenotype, an autosomal dominant phenotype, there is a weak A expression on group B red blood cells [5]. So, it’s usually detected as an ABO discrepancy during blood group confirmation. It could be missed if only the cell grouping is performed and may lead to mislabeling of the patient/recipient blood group. This may cause hemolysis in B(A) phenotype patient if patient is transfused with A or AB Packed Red Blood Cells (PRBCs) or might end up in cross match incompatibilities.

Therefore, some ABO subgroups require molecular method to identify and also to correlate the change between DNA sequence variation in the ABO gene and the quality and quantity of blood group antigens on RBCs [6]. Here we would like to share a case of probable B(A) phenotype in a patient who was diagnosed as chronic liver disease with acute pancreatitis. To the simplest of our knowledge, this is the primary report of probable B(A) phenotype in a patient from India.

**Case report**

A 65-year-old female was admitted to our tertiary care center with one-week history of pain in abdomen, loss of appetite, generalized weakness. A complete blood count revealed Hb: 7.8 g/dL. Patient diagnosis was Chronic Liver Disease (CLD) associated with pancreatitis. Blood requisition was received at our blood bank for two-units of packed red blood cells (PRBC) in view of anemia. Patient blood grouping was performed using fully automated immune-hematology analyzer (MatrixAutoMax-80, Tulip Diagnostics (P) Ltd, India) by cell and serum grouping on gel column agglutination technology. For
The ABO gene is located at long arm of chromosome 9 (9q34) with 7 exons. Majority of the exonic DNA encoding the enzyme’s entire catalytic domain of the ABO glycosyltransferases are harbored on exon 6 and 7. Studies showed that mutations of ABO gene affected A and B glycosyltransferase activity and caused variant ABO phenotypes [8]. The different B(A) phenotype occurs due to specific mutations on exon 6 of B gene that cause the B transferase to synthesize small amounts of A antigen [9]. However, this mutation can occur on both exon 6 and exon 7, with exchange in amino acid of DNA [10].

In the present case, patient had no documented previous blood group and no history of previous transfusion. Family history revealed husband and children’s blood group as A Rh D positive without any discrepancies. Patient cell and serum grouping revealed Type II blood group discrepancy. After serological workup, her blood group was interpreted as probable B(A) phenotype and got transfused with 2 units of cross match compatible O group red blood cells. Both the units were transfused successfully without any adverse events. Her post transfusion hemoglobin was 9gm/dl but got expired after 4-day stay in ICU due to worsened clinical condition. For further confirmation, saliva testing was not done due to unavailability of sufficient sample; molecular analysis and serum B-glycosyltransferase level estimation were not done due to lack of facilities.

This report highlights the importance of performing both cell and serum grouping for all the patient samples. Performing cell grouping alone, usually done at remote or district level blood centers will miss most of the weaker sub groups. This wrong practice may lead to mistyping of patients, cross match incompatibilities and delay in finding compatible blood unit. To the best of our knowledge, this is the first case reported in patients with probable B(A) phenotype from India. A Blood donor with similar blood group was reported from India by Jain et al. [11].

Conclusion

Weaker ABO blood group variants showing blood group discrepancies are often missed in routine practices. Advanced techniques like Adsorption-Elution, saliva secretor studies and molecular testing are required for accurate blood grouping, especially in patients needing blood and its components. This case report emphasizes on resolving blood group discrepancies in patient samples in order to provide best blood components timely.

References


