Incidental detection of Bombay Blood Group in an Elderly Patient Undergoing Evaluation For Thrombocytopenia: A Rare Finding

Ashay Dilip Amlekar[1], Satheesh Mani[2], Sajith B.S.[3]

ABSTRACT

Bombay blood group is a rare blood group characterized by absence of normal A, B and H antigens and presence of corresponding antibodies in serum. We present a rare case of a sixty-two-year patient who was incidentally detected having Bombay blood group. The patient was advised Indirect Coombs Test (ICT) as a part of evaluation for thrombocytopenia. The detection of Bombay Blood Group was confirmed following a series of tests in blood bank.

Key words: Indirect Coombs Test (ICT), Bombay Blood Group, Agglutination.

INTRODUCTION

Bombay blood group was first detected by Dr. Bhende in Bombay, India in 1952. [1] It is the rarest of the rare blood groups. It is usually confined to Southeast Asian countries with the incidence of about 1 in 10,000 in India and 1 in 10,00,000 in European regions [2] The clinical significance of the Bombay blood group includes the inability to transfuse with other blood groups, such as A, B, AB, and especially the O type [3]. The Bombay group is commonly misinterpreted as group O. As individuals of the Bombay blood group produce clinically significant levels of anti-H antibodies, only blood products belonging to the same blood group can be administered to them. Incompatible blood transfusions lead to haemolytic transfusion reactions, which contribute to morbidity and mortality. Timely detection of such cases is crucial [4].

CASE REPORT

A sixty-two-year patient's blood sample was received in our blood bank for the Indirect Coombs Test (ICT) who was undergoing evaluation in view of thrombocytopenia. The standard blood bank procedure was followed for the Indirect Coombs Test. The serum isolated from patient's blood was incubated with red blood cells of known antigenicity. Heamolysis occurred after incubation at 37°C. The test was repeated, and the result was the same. This prompted the laboratory to do an immediate spin with pooled cells and there was strong agglutination (4+), indicating probable presence of anti-H antibodies in patients' serum. Since there was only plain sample available, an EDTA sample was also requested and complete Forward and Reverse group was performed. Reverse Grouping showed agglutination in all tubes of A, B, and O Pooled Cells. Testing with anti H lectin was performed on Patient's Red Cells and the results were negative confirming the Bombay Group. Direct Coombs Test (DCT) was performed to rule out presence of cold agglutinins and results were negative. Auto control was negative which ruled out the presence of Autoimmune Antibodies. Indirect Coombs Test (ICT) could not be completed as the pooled Bombay blood group Red cells were not readily available. The patient had no history of blood transfusion but had donated blood once as a replacement donor, and the status of that blood unit is unknown. He was counselled about his phenotypical status, its rarity and advised to register himself with leading blood banks as a recipient and also to get his family members tested for their blood group. As the patient was resident of other state and family members were in a village, their blood group couldn't be tested. Patient after completion of treatment for thrombocytopenia returned to his state.

DISCUSSION

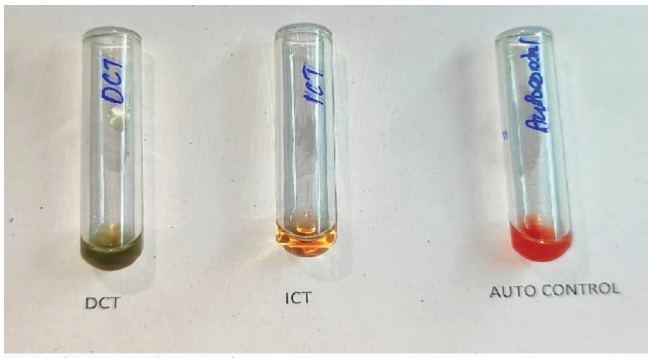
Indirect antiglobulin testing is clinically useful for the detection of circulating antibodies that have the potential to induce RBC hemolysis; this test is most commonly utilized for RBC phenotyping and in crossmatch screening for blood transfusion. [5] In Bombay blood group individual, there is no formation of H antigen due to lack of Fucosyl Transferase enzyme mediated by H gene. [6] Hence phenotypically, Bombay blood group is identified by the absence of A, B and H antigen on red cells while serum contains anti A, anti B and anti H. [7] The concern with Bombay blood group is that the individuals having this group can only receive either autologous blood donation or blood from an individual of Bombay phenotype. It is important to identify it in emergent situations, because any other type of blood being used can have lethal effects on the recipient. It is recommended that individuals with Bombay blood group should get all their family members and relatives tested for the blood group. They should also register themselves with leading blood

[1]Senior Divisional Medical Officer & Consultant Pathologist, Department of Pathology, [2]Chief Lab Superintendent, Department of Pathology, [3]Chief Lab Superintendent, Department of Pathology, Bharat Ratna Dr.Babasaheb Ambedkar Memorial Hospital, Byculla, Mumbai, Central Railway

Corresponding author: Dr. Ashay D. Amlekar,5/7 Central Railway Officers Quarters, Lakhamshi Napoo Road, Hindu Colony, Dadar East, Mumbai 400014

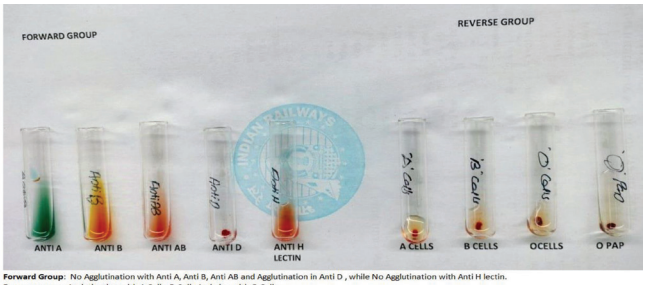
How to cite this article: Ashay Dilip Amlekar, Satheesh Mani, Sajith B.S. Incidental detection of bombay blood group in an elderly patient undergoing evaluation for thrombocytopenia: a rare finding. International Journal of Contemporary Medical Research 2024;11(11):K1-K2.

BY-NC-ND



DCT and Auto Control are Negative
ICT shows Haemolysis

Figure-1:



Forward Group: No Agglutination with Anti A, Anti B, Anti AB and Agglutination in Anti D , while No Agglutination with Anti H lectin.
Reverse group : Agglutination with A Cells, B Cells And also with O Cells.

Figure-2:

banks so that in case of emergency they can be contacted.[8]

CONCLUSION

A positive ICT result of a patient whose blood group is labelled as O phenotype should always be checked for anti H antibodies. Bombay group serum will give strong agglutination (4+) to haemolysis with pooled red cells. Thus positive ICT becomes the first indicator of the Bombay phenotype. For such patients, ICT can be completed with pooled cells from Bombay group donors only. Both forward and reverse grouping should be performed to confirm the diagnosis.

REFERENCES

1. Bhende YM, Deshpande CK, Bhatia HM, Sanger R, Race RR, Morgan WT, et al. A "new" blood group character related to the ABO system. Lancet 1952;1:903-4.
2. Balgir RS. Detection of a rare blood group 'Bombay (Oh) phenotype' among the Kutia Kondh primitive tribe of Orissa, India. Int J Hum Genet 2005;5:193-8
3. Ekanem, Emmanuel, Santosh Poozhikalayil, and Anita Sinha. 2020. "The Bombay Blood Group: How Rare Is It? A Case Report and a Review of the Literature". Journal of Advances in Medicine and Medical Research 32 (7):24-29.
4. Bhar (Kundu), Sudeshna; De, Anisha; Saha, Anindita; Bhattacharyya, Chiranjib. Pediatric patient with Bombay blood group: A rare case report. Saudi Journal of Anaesthesia 9(3):p 318-320, Jul–Sep 2015. | DOI: 10.4103/1658-354X.154738
5. Theis SR, Hashmi MF. Coombs Test. [Updated 2022 Sep 12]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/sites/books/NBK547707/
6. Das S and Kumar HRA. "Bombay Blood A Rare Entity". Journal of Clinical Biomedical Science 1.3 (2011): 122-125.
7. Oriol R.,et al. "Molecular genetics of H". Vax Sanguinis 78 (2000):105-108.
8. Suraci N, Mora M. Bombay blood phenotype: Laboratory detection and transfusions recommendations. Int J Blood Transfus Immunohematol 2016;6:8–11.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 28-09-2024; **Accepted:** 24-10-2024; **Published:** 30-11-2024