

Analysis of ABO blood group discrepancies in a tertiary care centre

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BACKGROUND:

- Ensuring the safety of blood transfusion is a fundamental responsibility of blood centres, necessitating the precise identification of ABO blood groups during pre-transfusion testing.
- Blood group discrepancy is the unexpected reactions in forward and reverse grouping resulting in a mismatch between both the results.
- The most common cause of a discrepancy is a technical or clerical error. After this possibility has been ruled out, ABO discrepancies fall into four general categories: 1) Weak- reacting or missing antibodies in the reverse grouping, 2) unexpected or additional antigen reactions in the forward grouping, 3) discrepancy between forward and reverse grouping caused by protein or plasma abnormalities, rouleaux formation, 4) discrepancy in forward and reverse grouping due to miscellaneous problems.

OBJECTIVES:

To analyse the reasons for commonly occurring ABO group discrepancies and their resolution by serological workup.

METHODS:

- A retrospective observational study was done in The Department of Immunohematology and Blood Transfusion, Civil Hospital, Ahmedabad for a period of one year from April 2023 to March 2024.
- Blood group discrepancies encountered over the period were retrieved from blood grouping discrepancy register and analysed.
- Blood group was determined by conventional tube technique and further investigated with additional techniques and reagents. The data was compiled, tabulated and plotted graphically.

RESULTS:

- A total of 1,26,839 samples received for blood grouping; discrepancy was encountered in 325(0.26%) blood samples. With group IV discrepancy being most prevalent 144 (44.32%), followed by group II discrepancy 92 (28.3%), group I discrepancy 78 (24%), group III discrepancy 11 (3.38%).
- Group I discrepancy was resolved by enhancing the reaction by prolonged incubation at 4 °C or by increasing serum: cell ratio.
- Group II discrepancy was noted due to subgroups, which was resolved most commonly by Anti-A1 lectin antisera.

Blood group discrepancies

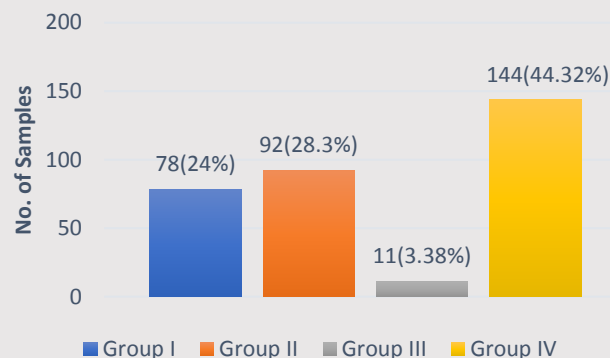


Figure 1: Category (group) wise distribution of discrepancies.

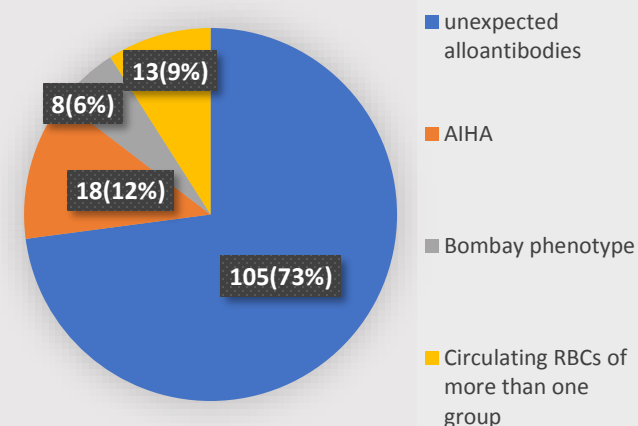


Figure 2: Underlying Reasons for Group IV discrepancy

- Group III discrepancy was resolved by washing the cells 3-4 times with normal saline.
- The underlying reasons for group IV discrepancies are unexpected alloantibodies, cold reactive autoantibodies, Bombay phenotype, Circulating RBCs of more than one ABO groups due to RBC transfusion or exchange transfusion. Cold autoantibodies were resolved by pre warming technique, Bombay phenotype was resolved by anti H lectin.

CONCLUSION:

- Resolving discrepancies before transfusion is essential. This study highlights the importance of both forward and reverse grouping.
- It is crucial to meticulously investigate all ABO discrepancies using available resources.
- Advanced investigative modalities, including molecular techniques, should be employed when serological methods are insufficient.
- In such patients where transfusion is unavoidable, O Rh Negative packed red cells and AB plasma can be transfused when resolution is delayed. In case of Bombay phenotype, only Bombay phenotype red cells must be transfused.

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