Bombay blood group - Case report

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INTRODUCTION

Bombay blood group, known as Oh (or) h/h blood group is the rare blood type. Bhende (1952), first discovered this blood group in Bombay (now called Mumbai), India (Balgir, 2005;, 2007; Chowdhury et al., 2013). The Bombay group (Oh) results from the inheritance of two rare recessive h genes which occur at a locus other than the ABO gene locus (Balgir, 2007; Chowdhury et al., 2013). It is a blood group which shows absence of A, B, H antigens on red cells and presence of anti-A, anti-B and anti-H antibodies in serum (Balgir, 2007; Chowdhury et al., 2013). The H antigen is located on the surface of red blood cells and is the precursor of A and B antigens. H antigen can be synthesized by H gene (FUT1) and (FUT2) which is located on chromosome 19 and give rise to glycosyltransferase that add 1-fucose to a precursor substance to produce H antigen on red cells (Balgir, 2005;, 2007; Khan and Mansoor, 2009).

India has the highest number of people with Bombay blood group and probability of finding person with Bombay blood type is 1: 10,000. In Tamil Nadu the prevalence is about 0.005 % (Anju et al., 2011; Balgir, 2007; Khan and Mansoor, 2009). A patient with Bombay blood group should be transfused only with same group. Whereas O Bombay donors packed cells can be transfused across ABO group (Hayedeh et al., 2007; Khan and Mansoor, 2009; Yashovardhan et al., 2012).

CASE REPORT

We report a case of 40 year old female patient, with complaint of lower abdominal pain and increased menstrual bleeding for 4 months with signs and symptoms suggestive of anaemia. The investigation revealed a haemoglobin of 9.2 g/dL; RBC count 4.14 millions/mm³; packed cell volume 30.3 %; Total leukocyte count 10,700/mm³ ; differential leuko-cyte count: neutrophils 59%; lymphocytes 36%; eosinophils 1.7%; and monocytes 2.9%; mean corpuscular volume 73.1 fL; mean corpuscular haemoglobin 22.2 pg and platelet count 2.96/mm³. Urea and creatinine were within normal limits. USG abdomen shows bulky uterus measuring 9.5 x 6.5 x 5.3 cm and fibroid measuring 2.7 x 2.1 cm approximately noted in anterior wall. Endometrial curettage and endocervical biopsy was done and sent for histopathological examination. Microscopic examination showed disorderly proliferative endometrium, cervix biopsy showed features of chronic cervicitis. Patient was first treated with hormone therapy for 6 months and observed.

Keywords: Bombay phenotype, H antigen, Oh blood group, rare blood type, transfusion reaction
In this rare Oh Bombay phenotype, the individual is homozygous recessive (hh) genotype of FUT1 and hence cannot form the H precursor of the A and B antigens whereas in ABO blood group, the individuals carries the homozygous dominant (HH) or heterozygous (Hh) genotype, and form H precursor of A
and B antigen (Khan and Mansoor, 2009). The expression of A and B antigen is determined by H and Se gene, which both give rise to glycosyltransferases that add L-fucose, producing the H antigen. Therefore H antigen is present in all human erythrocytes except those in rare individuals of oh-(Bombay) phenotype (Balgir, 2005).

During cell grouping or forward grouping Bombay blood group may be categorized as O group. When cross matching with other O blood group it would show incompatibility. Therefore reverse grouping and anti H lectin has to be performed to detect the Bombay blood group. These basic tests can prevent a patient from acute transfusion reaction (Hayedeh et al., 2013). Finding an O Bombay donor may be the tough part, but with the help of the rare donor registry in internet it is made very easy to find O Bombay donor. Every blood bank should maintain a rare donor register.

**CONCLUSION**

Bombay blood group is the rare phenotype and it can be mistaken as O. So proper testing is required to detect Bombay phenotype. Basic test with Anti H lectin confirms the absence of H antigen and reverse grouping with O cell confirms the presence of Anti H in the patient plasma.

Patient should be aware of Bombay phenotype and sufficient number of units should be reserved prior to the surgery as there is no alternative red cell transfusion in O Bombay phenotype. Autologous transfusion can be tried if the patient meets the selection criteria. In emergency if there is any delay in obtaining Bombay phenotyped units, patient should be supported only with the plasma or plasma expander. Never to transfuse the patient with O blood group as it contains higher number of H antigen which leads to acute transfusion reaction.

**REFERENCES**


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