Para-Bombay: A blind spot in blood grouping?

Access this article online	
Website: www.ajts.org	Quick Response Code:
DOI: 10.4103/0973-6247.83258	

Sir,

Para-Bombay or red blood cell (RBC) H negative secretor

individuals, having weak or absent anti-H activity, may remain undetected on routine blood grouping, as is illustrated in the following case.

A 64 year old lady was referred to us, as a suspicion of Bombay phenotype had been raised elsewhere. Two years previously, however, she had been uneventfully transfused with O positive blood. We performed grouping by tube method (using saline and low ionic strength solution at 37 and 4˚C, and Coombs antiserum) as well as column method. Forward grouping was negative with anti-A, anti-B and anti-AB antisera and positive with anti-D indicating O positive blood group. Anti- H lectin and serum from a known Bombay group donor showed negative reactions with patient cells signifying absence of H antigen on the patient's red cells. Backward grouping with patient's serum showed 4+ reactions with A group cells, and B group cells, and negative reactions with pooled O cells as well as cells from four out of five O group donors. One unit showed a 2+ reaction in the Coombs phase. An antibody screen using a commercial three cell panel was negative.

The patient's RBCs were then typed for Lewis antigens. This showed Le (a-b+) denoting secretor status. On the basis of these tests, para-Bombay (RBC H negative, secretor) phenotype was assigned. Presence of H antigen on the RBC membrane and in secretions is determined by *H* and *Se* (secretor) blood group loci respectively, which code for distinct Fucosyl Transferase (FUT) enzymes- FUT 1 and FUT 2.[1,2] The classical Bombay group is *hh/sese*, i.e., lacking both H and Secretor gene function, whereas persons with *hh/Sese* or *hh/SeSe*, lack H antigen on RBCs but possess it in secretions and are referred to as para-Bombay secretors or RBC H negative secretors.

Para-Bombay group individuals usually retain some H antigen on RBCs and weak anti-H activity, which is often demonstrable only at 4˚C or by using absorption and elution techniques. In our patient, no anti-H activity was demonstrated either by routine techniques or at 4˚C. Without the use of anti-H lectin or antiserum, the para-Bombay phenotype would have remained unidentified and the patient, grouped as O.

The reported prevalence of Bombay and para-Bombay phenotypes in Indians is reportedly 1/10,000.[2] However, since anti-H is not routinely used in blood grouping, many cases may remain undetected.

Koda *et al.*, attribute Indian Bombay and para-Bombay phenotypes to an inactivating missense mutation at the H locus, accompanied by deletion at the SE locus in the case of Bombay individuals.[3]

Based on their study, Lin Chu *et al.*, stated that Chinese and possibly other para-Bombay individuals who are secretors may be transfused with compatible (especially pre warmed indirect antiglobulin test compatible) units of normal ABO blood groups when units of Bombay or para- Bombay blood are not available'.[4] Whether this inference applies to the Indian population has not been examined. Hence we recommended autologous transfusion in this case, although a previous O blood group transfusion appeared to have produced no reaction.

Mary P. Chacko, A. Mathan, D. Daniel
Department of Transfusion Medicine and Immunohaematology, Christian Medical College and Hospital, Vellore, India

Correspondence to: Dr. Mary Purna Chacko, Department of Transfusion Medicine and Immunohaematology, Christian Medical College and Hospital, Vellore - 632 004, Tamil Nadu, India.
E-mail: purna@cmcvellore.ac.in

References

1. Kumazaki T, Yoshida A. Biochemical evidence that secretor gene, Se, is a structural gene encoding a specific fucosyltransferase. Proc Natl Acad Sci USA 1984;81:4193-7.
2. Blood groups and red cell antigens. Dean L. Bethesda (MD): National Center for Biotechnology Information (NCBI), National Library of Medicine, National Institute of Health, Bethesda, MD (US); 2005. Available from: http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi. [Last cited on 2010 Mar 3].
3. Koda Y, Soejima M, Johnson PH, Smart E, Kimura H. Missense mutation of FUT1 and deletion of FUT2 are responsible for Indian Bombay phenotype of ABO blood group system. Biochem Biophys Res Commun 1997;238:21-5.
4. Lin-Chu M, Broadberry RE. Blood transfusion in the para-Bombay phenotype. Br J Haematol 1990;75:568-72.