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Case report *Medical research*

A case report of Antepartum Haemorrhage and Bombay blood group

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Case history

A 24 year old woman Primi gravida with seven months period of gestation came from fisherman community, Gangavaram mandalam from low socio economic status, presented with bleeding per vagina since one day. She was admitted in labour room for evaluation and management. There was no history of labour pains or draining per vagina. No history of trauma. She was having regular cycles with moderate flow. And no other medical or surgical complications associated with.

On examination the woman was very pale with tachycardia with low blood pressure. Obstetric examination showed the height of uterus 28 weeks which was corresponding to the period of gestation with good fetal heart rate, and uterus relaxed. Speculum examination confirmed that there was no active bleeding other than brownish discharge.

Investigations confirmed that she was anaemic with 7G HB, blood group O +ve with non-reactive screening reports. USG showed a single live fetus with 28 weeks of gestation with major degree of Placenta previa.

Management:

As she was anaemic we decided to transfuse the compatible blood. Blood sample for cross matching for two to three units of blood was sent. But her blood was repeatedly incompatible with O +ve blood from the blood bank in our hospital. Then we tried from another two blood banks outside the hospital. The medical officer from the Lion's blood bank informed us that the blood group was Bombay blood group which was very rare and that was the reason for incompatibility. When we were trying to get the blood of Bombay blood group, we failed to get, because of it's rarity. Finally we motivated the donor from her close relative, maternal uncle having same blood group which was compatible to her blood.

Fortunately we were able to get two units of compatible blood with Bombay group from Lion's blood bank and transfused. We identified another donor from the same community with Oh group. We kept his contact address and informed to be ready to donate blood when this woman required. The woman had again a massive bout of bleeding at 32 weeks. Then we decided for termination of pregnancy. The Women was given two dose of Betamethasone for lung maturity. We reserved two units of blood from the blood bank in Hyderabad. The pregnancy was terminated by Elective Caesarean section and resulted a live female fetus with APGAR 10 with weight 1.9 KGS. One unit Oh blood transfusion was given. The post-operative period was uneventful and discharged her on 8th PO day with Iron supplementation.

DISCUSSION

The hh blood group is known as Oh or Bombay blood group which was discovered by Dr.Y.M.Bhende in Bombay in 1952(1). In this blood group the blood cells do not have ABO antigens and H antigen. H antigen is the precursor of ABO blood group antigens resulting Anti A, Anti B, Anti H antibodies. This blood is incompatible with all other blood groups except with similar phenotype. The Bombay (Oh) phenotype is characterized by the absence of A, B, and H antigens on red cells and occurs rarely, especially in tribal populations of India. It is found in 1 in 10,000 individuals in India. Balgir has shown 1 in 278 incidence of the Bombay phenotype among the Bhuyan tribal population of Orissa (India). He has also reported an incidence of 1 in 33 among the Kutia Kondh primitive tribe from Kandhamal district of Orissa(2). And 1 in one millions in Europe. Reverse grouping or Serum grouping need to be done to diagnose this rarest group. (3). But in Thaiwan little high incidence with 1 in 8000. But a very high incidence is in people living on Reunion (Island in Indian Ocean). Approximately half million people were identified. As this blood group with lack of H antigen (5). the people with this blood group can receive only from the donors with H antigen deficient. Because the A and B antigens cannot be formed without the H antigen precursor, their RBCs also lack these antigens. As a result, these individuals produce anti-H, anti-A, and anti-B and can therefore be transfused only with RBCs that also lacks the H, A, and B antigens i.e., they can only receive blood from another person with the Bombay phenotype.

The function of the H antigen, apart from being an intermediate substrate in the synthesis of ABO blood group antigens, is not known although it may be involved in cell adhesion (6)

The clinical significance of the Bombay blood group is Transfusion reaction If patients with anti-H in their circulation receive transfusions of blood that contains the H antigen (e.g., blood group O), they are at risk of suffering an acute hemolytic transfusion reaction due to Anti H reactivity(6).Hemolytic disease of the newborn. In theory, the maternal production of anti-H during pregnancy could cause hemolytic disease in a fetus who did not inherit the mother's Bombay phenotype. In practice, cases of HDN caused in this way have not been described, possibly because of the rarity of the Bombay phenotype(6).

Blood group O is present 45% in Caucasians, 49% in Blacks, 43% in Asians, and 55% in Mexicans The frequency of the H antigen is equivalent to the frequency of blood group O in which the H antigen remains unaltered (7). Anti-H is naturally occurring in people with H antigen deficiency. Anti H reactivity can be capable of hemolysis. It can activate the complement cascade which lyses RBCs while they are still in the circulation (intravascular hemolysis).

Biochemistry of Antigens: The H antigen and the A and B antigens are synthesized by series of enzymes i.e Glycosyl transferases that transfer monosaccharides resulting antigens with oligosaccharide chains which are attached to lipids and proteins that are anchored in RBC membrane.

The H antigen is produced by a specific fucosyl transferase. Depending upon a person's ABO blood type, the H antigen is converted into either the A antigen, B antigen, or both. If a person has blood group O, the H antigen remains unmodified. Therefore, the H antigen is present in the highest amounts in blood type O and in the least amounts in blood type AB. Two regions of the genome encode two enzymes with very similar substrate specificities—the H locus (FUT1) and the Se locus (FUT2).The H locus contain the FUT1 gene, which is expressed in RBCs. At least one functioning copy of FUT1 needs to be present (H/H or H/h) for the H antigen to be produced on RBCs. If both copies of FUT1 are inactive (h/h), the Bombay phenotype results.

The Se locus contains the FUT2 gene, which is expressed in secretory glands. Individuals who are "secretors" (Se/Se or Se/se) contain at least one copy of a functioning enzyme. They produce a soluble form of H antigen that is found in saliva and other bodily fluids. "Non-secretors" (se/se) do not produce soluble H antigen. The enzyme encoded by FUT2 is also involved in the synthesis of antigens of the Lewis blood group.

The common H phenotypes are "secretor" and "non-secretor". In Secretor type, H antigen is expressed on RBCs and in saliva. Anti-H is not produced. The genotypes are H/H or H/h; Se/Se or Se/se. In Non Secretor type H antigen is present on RBCs. But it is absent from saliva. No anti-H is produced. The genotypes are H/H or H/h; se/se

In Bombay phenotype H antigen is not expressed on RBCs and not found in saliva. The Serum contains anti-H. The Genotype is h/h se/se

The screening for H deficiency in individuals with circulating Anti H is confirmed by Haemagglutination using the lectins Ulex europaeus and Lotus tetragonolobus and human anti-H sera from known Bombay subjects(8)

CONCLUSION

Oh or Bombay blood group is very rare. If the cross matching sample of O+ve blood is repeatedly incompatible with blood with O+ve blood, we need to suspect Bombay blood group. And we should confirm by Haemagglutination test. And as this blood group is very rare, it is better to form a Forum of similar phenotype and educate them to donate blood for needy people in area wise.

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