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Case Report

Obstetrics and Gynaecology Section

A Rare Case of A2+ve Blood Group in an Obstetric Emergency

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ABSTRACT

We present a rare case of A2+ve blood group with Placenta praevia with Obstetric Haemorrhage in mild hypovolemic shock. An emergency request for blood transfusion confounded the blood bank officer as the patient's blood was seemingly incompatible with all ABO blood groups. Further investigation revealed the patient's blood group to be a rare subtype of the A group known as A2+ve. This article highlights the need to be aware of such rare subgroups, especially in tertiary referral centres like ours, where unbooked Obstetric emergencies are encountered on a regular basis, so life-saving measures can be appropriately taken.

Keywords: Placenta Praevia, ABO Blood-Group System, Blood Transfusion

CASE REPORT

A 31-year-old unbooked lady presented to the Obstetric emergency ward and a diagnosis of gravida 2, para 1, living 0 with 27 weeks of gestation with central placenta praevia with ante partum haemorrhage was made. She had undergone a previous caesarean section at term for a transverse lie and the baby was still-born. Patient had been treated for secondary infertility and conceived spontaneously ten years later with the present pregnancy. General examination revealed the patient to be in mild hypovolemic shock with a tachycardia of >130 beats/minute. Her blood pressure was 94/60 mmHg. Haemoglobin was 8.4 gm/dL. Blood group was A+ve but when sent for cross matching was found to be incompatible with all ABO groups. Senior blood bank officers were called in and further tests done indicated a rare subgroup of A2+ve. No blood in our bank and two other major blood banks was found compatible. Ultimately, four pints of compatible A2+ve blood was found after screening nearly 600 pints of A+ve blood at the Karnataka Red Cross Blood Bank. At present patient has received 3 pints of blood and antenatal steroids. Since she has no further bleeding we plan to monitor her as an inpatient till she crosses her period of viability or the fetus can sustain in an extra uterine environment, provided she has no further life threatening haemorrhage which would compromise either her or the baby.

DISCUSSION

Massive obstetric haemorrhage is a major contributor towards maternal morbidity and mortality. The main causes are abruptio placentae, placenta praevia and postpartum haemorrhage [1]. Clinicians managing pregnant women should be equipped with the knowledge of blood and blood products and skills for managing massive obstetric haemorrhage. We are all familiar with the blood groups O, A, B discovered by K Landsteiner in 1900, by performing a series of mixing experiments with the blood of 22 colleagues in which red cells from each individual was mixed with the serum of each of the others. On the basis of the agglutination pattern that he observed, Landsteiner could establish three groups of individuals (A, B and O). Two years later, Landsteiner recognised a fourth (AB) group when the experiment was repeated on a larger group of subjects. Most clinicians are, however, unfamiliar with the fact that in 1911, Landsteiner detected the presence of subgroups of A, one of which was exhibiting weaker expression of the A antigen and named the two subgroups A1 and A2. Genetically, A2 is an Arctic biotype, inherited as a Laplander gene from ancient ancestors in Scandinavia [2]. 80% of blood group A and AB persons are subtype A1 and A1B, respectively. The other 20% of these blood groups are subtype "non-A1", most often A2 (or A2B), but occasionally a more rare subtype (e.g. A3, Aint, etc.). [3] Thirty-three major blood group systems (including the AB and Rh systems) have been recognised and any of them, if mismatched can cause haemolytic transfusion reaction. The percentage of A blood group in Indians is lesser than Caucasians at 27% and 41%, respectively. O group is the highest in Indian population at 34% followed by B group at 31%. AB is rarer at 8% [4]. The occurrence of A2 subgroup is rare in the Asian population and hence, A2 and A2B blood groups are the rare blood types amongst Asians. The African and Caucasian populations also show a lower frequency of the blood group A2B. Incidence of A2 population in India is approximately 8.0% and for A2B is 8.6% [5]. The prevalence of anti-A1 antibodies among A2 and A2B samples was 1.8% and 3.75%, respectively [6]. Generally an A2 is not identified until they have developed an antibody to A1 cells. This occurs either from an exposure by transfusion or a pregnancy. Once an A2 has developed an anti-A1, the A2 can only be transfused with A2 blood or with O blood that is compatible. When organs are transplanted between individuals, similar ABO compatibility/immune rejection considerations also apply, but there have been some documented cases of organs from A2 individuals being transplanted into group O or B patients, without the need for debilitating immune suppression [7]. Most of the individuals with a rare blood group are coincidently identified when a routine pre-transfusion testing or pregnancy follow-up is performed, if the antibodies corresponding to the rare specificity are present. There is a growing awareness of the impact of the genomics revolution on transfusion medicine and its potential to transform the way blood is selected for transfusion. From antibody-based technology to now single-nucleotide polymorphism (SNP) genotyping for blood, PCR-technology will help in extended matching of RBC units [8]. Such advances in cross-matching of blood can save the lives of many, especially, as in this case, young women of child bearing age and thus reduce maternal mortality.

CONCLUSION

An awareness of rare blood groups and subtypes will help focus on recruiting minority donors. Though, multiple SNPs are available for ABO typing, providing extended-matched RBC units is unlikely

for all patients. But, with advances in genotyping and better blood inventory–management systems more patients will be able to benefit from extended-matched transfusions.

Until then, the challenge lies in integrating such testing into the blood bank environment, standardizing methods and enhancing information systems to use effectively. In India where maternal mortality rates are still high, the major cause being haemorrhage, easily accessible compatible blood transfusion would help decrease these rates. The establishment of a state and national register of donors of rare blood groups and their alleles in India would aid in creating awareness of their existence.

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