INTRODUCTION
The Bombay group is a rare autosomal recessive phenotype within the ABO blood group. It represents genetically suppressed A, B and H genes. When considering such patients for transfusion, only blood of identical Bombay type can be safely transfused. We are reporting a patient having Bombay phenotype blood, underwent emergency dilatation and curettage with active per vaginal bleeding due to retained products of placenta. There are numerous anaesthetic considerations, including emergency surgery with hemodynamic instability due to ongoing blood loss, dilutional coagulopathy as well as presence of Bombay phenotype that severely limit the possibility of red blood cell transfusion. Only four donors were registered with the blood bank of the institution and none was traceable. It becomes a real challenge for the anesthesiologist to manage such type of patients without having units of red packed cell which management is described hereby.

CASE REPORT
A 22 years old female weighing 53 kg with no known comorbidities presented in emergency department (ER) with heavy per vaginal bleeding due to retained pieces of placenta. She delivered a baby 4 hours ago per vaginally and was referred to our hospital for further management. At the time of presentation in ER, the patient was hemodynamically unstable with heart rate of 130 beats per minute and blood pressure of 80/45 mmHg. Her respiratory rate was 24 breaths per minute and oxygen saturation was 96% on room air. She was immediately shifted to theatre for dilatation and curettage, in the meanwhile her blood was sent for laboratory investigations as well as for cross match. At the time of induction we just came to know that patient’s blood group is Bombay phenotype, so the option of red blood cells transfusion was not there. Only 4 donors with Bombay phenotype were registered with the Blood Bank of the Aga Khan University Hospital. We tried to contact the donors but none of them was available. Other laboratory investigations were within normal limit except hemoglobin, which was 9.3 gm/dl.

Because her fasting was incomplete, rapid sequence induction with cricoids pressure was planned. Patient was induced with midazolam 2 mg, ketamine 75 mg and suxamethonium chloride 80 mg. Intravenous pethidine 50 mg was given after intubation for analgesia. Anaesthesia was maintained with 40:60 oxygen and

ABSTRACT
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Key Words: Bombay phenotype. Hemodynamic instability. Dilatation and curettage. Blood group.
nitrous oxide along with intravenous infusion of midazolam at 2 mg/hour along with intermittent boluses of atracurium. BIS value was maintained between 46 - 54 throughout the procedure.

Duration of surgery was 2 hours. The blood loss was approximately 1200 ml, which was replaced by crystalloid and colloid. We maintained her hemodynamics with heart rate between 90 - 105 beats per minute and mean arterial pressure between 60 - 65 mmHg to minimize blood loss. Placenta was removed with dilatation and curettage and there was no active bleeding.

At the end of surgery, oropharyngeal suctioning was done and residual neuromuscular blockade was reversed with neostigmine 2.5 mg and 0.4 mg glycopyrrolate. She was allowed to regain complete consciousness and reflexes, after then she was extubated. She was shifted to recovery room and her postoperative vitals were within normal limits except her heart rate 100 - 110 / minute.

In the recovery room we sent her blood for laboratory investigation in which all labs were within normal range except hemoglobin level of 7.2 gm/dl and international normalization ratio (INR) of 1.75. So six units of FFPs were transfused to patient. Patient remained stable in the recovery room and shifted to the ward next day.

DISCUSSION

Bombay red blood cell phenotype (Oh or hh) was first described by Bhende et al. in 1952 who documented the incompatibility of a patient with group O blood with multiple group O donors. The Bombay phenotype has since been determined to be a rare autosomal recessive phenotype confined mostly to the Southeast Asian countries.

According to the International Society for Blood Transfusions, there are over 700 documented erythrocyte antigens and twenty-nine blood grouping systems. Landsteiner's ABO blood typing system remains the single most important group for blood transfusions. Briefly, the A, B, AB, and O blood types refer to specific antigenic sugar moieties attached by an alpha 1-2 linkage to short oligosaccharide chains that exist as the carbohydrate moiety of glycolipid and glycoprotein molecules located on red blood cells. This linkage is controlled by the action of glycosyltransferase enzymes that specifically select for N-acetyl-D-galactosamine (GalNAc) for type A and for D-galactose (Gal) for type B. The glycosyltransferase enzyme for type O blood cross-reacts immunologically with the A and B transferase enzymes but is functionally silent. These transferase enzymes are the product of four major alleles located on the long arm of chromosome 9.

In addition, there is another glucose antigenic moiety, fucose, the H antigen, which serves as the precursor of the A, B, and O antigens. The responsible transferase for fucose is the product of a very common H gene that is lacking in the Bombay phenotype. Since the fucose moiety is a necessary precursor for the A and B antigens, Bombay blood will type as O, but will have hemolytic auto-antibodies to the H antigen.

The Bombay type is very peculiar because in routine tests for blood grouping it is a O type, but during cross-matching procedure donor's O-type cells get clumped with the serum of Bombay type recipient, as Bombay type possesses suppressed H-gene. The serum contains anti-H antibody as an A or B-type serum does anti-B or anti-A respectively as a natural protector. When considering such patients for transfusion, only blood of identical Bombay type can be safely transfused.

Thus, perioperative management of transfusion with autologous red blood cells is challenging given the conflicting concerns of a limited supply of available blood. It is fortunate that patients with Bombay phenotype can receive any fresh frozen plasma, platelets and cryoprecipitate for the treatment of coagulopathies. There is no well-documented disease association with Bombay phenotype. However, all patients with type O blood, including Bombay phenotype, have been described with higher rates of bleeding complications.

There are numerous anaesthetic considerations for this particular case including emergency surgery with ongoing bleeding along with hemodynamic instability, dilutional coagulopathy and presence of Bombay phenotype that severely limits the possibility of red blood cell transfusion.

In elective surgeries, the approach of pre-donating and deep freezing autologous red blood cells has been used successfully. Patients with Bombay phenotype red blood cells present as type O, but they are unable to receive red blood cells from any phenotype other than Bombay phenotype. Fortunately, they are able to receive all other blood products, including fresh frozen plasma, cryoprecipitate, platelets, prothrombin complex concentrate, and recombinant activated factor VIIa. Coordination among blood bank service, surgery, and anaesthesia is important in managing these patients.

REFERENCES


