Acta Scientific Women's Health (ISSN: 2582-3205)

Volume 3 Issue 5 May 2021

Review Article

A Review Article of Successful Feto-Maternal Outcome in Bombay Blood Group with Pregnancy and Severe Anemia: A Rarest Clinical Scenario

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Received: March 31, 2021

Published: April 23, 2021

Abstract

Bombay blood type is the rarest blood group known all over the world. The worldwide incidence of Bombay Blood group is one in every 250000 worldwide [1]. On red blood cells of these people there was absence of A, B and H antigens and also the anti-H antibodies were present in plasma. There is a probability that he anti-H antibodies in the maternal blood may lead to hemolytic disease in newborn and may trigger severe transfusion reaction specially hemolysis when exposed to any blood type other than Bombay blood group. Bombay blood group in pregnant is a rare entity. We report a case of Bombay blood group with anemia with preeclampsia with previous caesarean section managed intensively to give a healthy mother and baby. The biggest task is arranging blood for transfusion because the Bombay blood group is not available easily.

Keywords: Bombay Blood Group; Rare; Pregnancy; Preeclampsia; Autologous Transfusion; Anemia

Introduction

Bombay Blood group's incidence being about 1/10,000 individuals in India [3]. Its rare incidence makes the management even more difficult. The antigens on the red blood cells of these individuals such as A, B and H are not present. Also these people are characterised by the presence of antibodies in plasma that shall cross- react with all ABO phenotypes as a result of which they can be transfused with Bombay blood only [2,3]. It is this patho-physiology that makes the condition difficult to manage. The presence of anemia further makes the clinical scenario problematic to be managed.

Case Presentation

A 30 years old female, Gravida 2, Parity one, Living one, Previous Cesarean section, with 37.6 weeks of gestation, came with complaints of pain in abdomen and bilateral pedal edema since 15 - 20 days.

Obstetric history

Married Since 7 years, Gravida 1: 3.5 years back, female child, delivered by cesarean section in view of? Pre-eclampsia at Kalwa Hospital. No history of antenatal, postnatal and intra-partum com-

plications. She was immunized and registered. She was a diagnosed case of Bombay blood group and was hospitalized during the 4th month of the present pregnancy and was transfused 4 pints of blood.

On Examination, General condition fair, Afebrile, Pulse: 90 beats/min, regular, blood pressure: 140/90 mm Hg, Pallor was present, bilateral pedal edema was present, Urine albumin +1, deep tendon reflexes were normal and there were no premonitory symptoms present, vulval edema was present.

Her systemic examination revealed no abnormality. On abdominal examination uterus was 34 -36 weeks gestational size with podalic presentation, her Fetal Heart Sounds were regular, 144/min. The uterus was relaxed with no scar tenderness demonstrable. On speculum examination, we did not demonstrated any leak/bleed and her os was closed.

Her investigations revealed, Hemoglobin: 5.9 gm%, Platelet: 59 x1000/cu mm, WBC: 10.2 x1000/cu mm, Total Bilirubin: 1.6 mg%, SGOT: 22.9 U/l, SGPT: 15.7 U/l, Creatinine: 0.9 mg%, Uric Acid: 4.2 mg%, PT - 17.9 seconds, INR -1.41, Serum Iron: 41.5 ug %, Ferritin: 6.0 ng/mL, LDH: 481 U/l.

Patient was transfused two pints of whole blood. Patient underwent Cesarean section (under general anesthesia) as the patient was not willing for trial of labor after cesarean section (TOLAC). Intra operatively, she was given 1 pint whole blood and 1 pint FFPs. Patient delivered a female baby weighing 1.6 kg; baby was admitted in NICU in view of low birth weight.

Post operatively, the patient was managed in Intensive Care Unit. On day 2 post cesarean section, the patient had almost nil urine output and for which she underwent 2 cycles of hemodialysis.

On Ultrasound, gross ascites with bilateral medical renal disease detected. Frequent ascitic fluid tapping was done and fluid sent for cytology; fluid protein content found to be much higher than sugar content. SAAG (Serum Ascites- Albumin Gradient) was found to be higher than normal (2.06) suggesting further evaluation of liver disorders like Budd Chiari syndrome or Wilson's disease. However, her Auto immune disease of smooth muscle was ruled out by negative test results for ASMA (Anti Smooth Muscle Antibody). Wilson's disease ruled out by normal value of 24 hour urine copper levels.

Contrast Enhanced Computed Tomography of abdomen suggestive of the likelihood of SBP (subacute bacterial peritonitis) along with liver cirrhosis and splenomegaly, with bilateral pleural effusion.

Gastro enterology opinion suggested possibility of decompensated liver cirrhosis as a consequence of Budd Chiari syndrome or Wilson's disease with portal hypertension. Budd Chiari syndrome was ruled out as CECT showed normal IVC and hepatic veins. Wilson's disease was ruled out by ophthalmology work up showing no Kayser-Fleischer rings and no raised copper levels in the urine.

Abdominal Koch was made the diagnosis of exclusion and patient was started on AKT category I. Patient gradually improved on AKT with relief of signs like ascites, pedal edema and vulval edema.

The baby was monitored in neonatal ICU, was evaluated for Rh status which was positive, and baby gained weight gradually.

The patient's condition was managed with the involvement of multispecialities and was later on given discharge with a healthy baby.

Discussion

The rarity of the blood group and hence its meagre availability makes the management of such cases difficult. The Bombay blood group is an autosomal recessive phenotype resulting because of point mutation of the H gene as a result of which A, B, and H antigens are absent and hence anti-A, anti-B, and anti-H antibodies are produced in their blood [2,3]. Since there is absence of A and B antigens are absent in these people, hence the condition mimics the O blood group thereby making the diagnosis difficult. Hence in order to transfuse these patients, only two options are available, either an autologous blood transfusion or the transfusion with Bombay Blood group blood [4].

There is a theoretical risk of embellishment of anaemia, fetal tachy-bradyarrythmias etc if autologous transfusion is done in a pregnant women. Although some studies depict that autologous transfusion can be carried out without any problems practically [5]. Others have proposed the need for reconsideration in obstetric patients [6]. Yamada., *et al*. after studying the effects post autologous transfusion have suggested doing blood collection at 32-week gestation by phlebotomy of 400 ml per week [7]. In this case, we

did not have time to consider autologous transfusion because the patient was referred at a later stage.

The anti- H titres if in a very significant number in Bombay Blood group pregnancy may lead to hemolytic Disease of newborn in rare cases however it may not be true for every case. The meagre incidence of such cases may also because of a very minute amount of expression of the carbohydrate antigen by the red blood cells of fetus and also because majority belongs to the Ig M class which is known not to cross the placenta. The management calls for multimodality approach along with the provision of Bombay Blood standby to manage the cases efficiently [8].

Such cases are well manged if timely registration of referral is made. The work of certain voluntary groups that maintain a registry of such people with Bombay Blood Group is commendable. It is with their help that the availability of blood can be done with some ease.

When iron supplementation fails alone to combat the problem of anemia in these cases, use of parenteral iron and injection erythropoietin can be done. This combination can restore hemoglobin at a rate of 3.0 g/dl increase within 2 weeks) [9].

The case being previous caesarean made it even more challenging. A substantial reduction in a rate of primi caesarean section must be done to decrease the cases of placenta previa in scarred uteri [10]. The high incidence of unscarred caesarean sections to the propensity for trial of labour in a previous caesarean section is a significant change witnessed in a last decade [11]. However in this case patient was not willing for trial of labour after cesarean section and hence the case was managed with great surgical expertise and experience to make the intrapartum course uneventful.

Conclusion

If we know about the Bombay blood group in antenatal women, then we can contact and arrange for Bombay blood group donors. The management of Bombay Blood group in case of antenatal women, requires intense multiprong efforts by all specialities. The challenge lies from diagnosis of this rare blood group, to management of the anemia and its complications. The availability of blood and preparing a women to undergo uneventful obstetric course can be done by considering autologous blood transfusion and giving iron supplements. Maintenance of a blood group registry is essential. The risk of hemolytic Disease of newborn should be born in mind while managing a multiparous women.

Conflict of Interest

None.

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