Case Report

Lower segment cesarean section in a patient with severe thrombocytopenia and pregnancy induced hypertension

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Abstract

Thrombocytopenia in pregnancy carries a major risk of feto-maternal morbidity and mortality. We present a case of hypocellular bone marrow with severe thrombocytopenia with pregnancy induced hypertension (PIH) for emergency lower segment cesarean section (LSCS). This disease is characterized by pancytopenia and hypocellular bone marrow with impaired morphology and maturation. Causes of death due to this disease include hemorrhage and infection secondary to thrombocytopenia and neutropenia especially following surgery. We report successful management of emergency LSCS with severe thrombocytopenia with severe PIH.

Key words: Hypocellular bone marrow, pregnancy induced hypertension, thrombocytopenia

Introduction

A few cases of severe disease form have been described in pregnancy and in a majority the outcome is poor. Pregnancy can be one of the causes of this disease and in some instances the severity spontaneously reduces after delivery. Thrombocytopenia is second only to anemia as the most common hematologic abnormality during pregnancy.[1]

Case Report

A 38-year-old female in her $G_4P_3A_{0\ L0}$ was referred from peripheral hospital at 32 weeks of gestation for safe confinement in precious pregnancy. Patient had unexplained fetal loss at 6-8th months of gestation in previous three pregnancies, on investigating for bad obstetric history during the current pregnancy she was diagnosed as a case of hypocellular bone marrow with severe thrombocytopenia with pregnancy induced hypertension (PIH) at peripheral hospital and was referred to our Tertiary Care Center for further management. On admission to hospital, patient was hemodynamically stable with blood pressure (BP) of 140/90 mmHg on Tab. methyldopa 250 mg, which was started in peripheral hospital. Laboratory analysis showed total leukocyte count 7200/μL, hemoglobin (Hb) 8.5 g/dl, hematocrit 22.6%, platelet count 6000/mm^3 and blood group O negative, the blood picture showed pancytopenia and bone marrow biopsy was compatible with hypoplastic marrow.

There was a dilemma regarding the best possible plan in this case, considering thrombocytopenia along with concerns regarding Intrauterine growth retardation (IUGR) and fetal well-being. In the ward, the patient received 20 units of platelets, 2 units of whole blood as the patient was clinically very pale, oral prednisolone 10 mg tid, oral hematinic, but counts did not improve with repeated platelet concentrate transfusion though antiplatelet antibody and ANA were negative. Other investigations include antigen test for paroxysmal nocturnal hemoglobinopathies, factor V mutation, direct comb's test, Fanconi anemia all showed negative results with no any abnormality on Hb electrophoresis. Hematology experts had advised to transfuse single donor platelets peri-operatively.

As the patient deveopled leaking per vaginal and Ultra sonography (USG) Doppler showed IUGR and intermittent absent end diastolic flow, she was posted for emergency lower segment cesarean section (LSCS) before which adequate units of blood and single donor platelets were arranged. Prior to surgery, patient's fasting status was confirmed, high-risk written informed consent was taken for emergency LSCS under

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general anesthesia. Her hemodynamic parameters showed blood pressure of 210/100 mmHg and heart rate of 160 beats/min. Investigations revealed Hb of 9.7 g/dl and platelet count of 7000/mm^3. Patient was taken in the Operation theatre and Electrocardiogram, Oxygen saturation, Non-invasive Blood Pressure monitors were attached and was administered IV Nitroglycerine of total dose 60 μg in incremental doses and IV metoprolol 1.5 mg to achieve acceptable control of blood pressure. As per hematology reference, 6 units of platelets were transfused prior to induction. Pre-medication with IV Ranitidine 50 mg and IV ondonsetron 4 mg, IV glycopyrrolate 0.2 mg, IV hydrocortisone 100 mg was administered and was pre-oxygenated with 100% oxygen. Anesthesia was induced with 300 mg of thiopentone sodium and tracheal intubation was facilitated with 100 mg of succinylcholine by rapid sequence induction-intubation technique and IV xylocard 50 mg administered to blunt the pressor response. Thereafter, anesthesia was maintained with nitrous oxide-oxygen-vecuronium. A female infant weighing 960 g was delivered with poor Apgar scores ($\leq$4), hence shifted to neonatal intensive care unit (NICU) for further management. Midazolam 1 mg and fentanyl 100 μg was supplemented following baby delivery. Patient maintained stable hemodynamics intra-operatively and total blood loss was 1200 ml, 2 units of blood and 10 units of platelets were transfused. At the end of procedure neuromuscular blockade were reversed with neostigmine 0.25 mg and glycopyrollate 0.8 mg and trachea extubated on the operation table after confirming complete return of muscle power, tone and respiratory efforts with obeying commands.

Following surgery, the patient was shifted to Post-operative Anesthesia Care Unit (PACU) for monitoring and further management. In the PACU patient received 2 units of blood, 3 units of cryoprecipitates, and 12 units of platelets as per the losses through drain. Any form of intramuscular injections was avoided. Prophylactic antibiotics were continued with IV cefuroxime 1.2 gm 12 hourly and IV metronidazole 500 mg 8 hourly. Post-operative analgesia was provided by IV paracetamol 15 mg/kg 8 hourly and post-operative persistant hypertension was controlled with continuous infusion of Nitroglycerine @ 0.5-1 μg/kg/h for next two days and then shifted to oral antihypertensive Labetalol 100 mg 12 hourly and oral prednisolone 10 mg 8 hourly was also continued. On the 2nd post-operative day investigations showed Hb of 9.8 gm, platelet count of 28000/mm^3, on day three, patient was shifted to ward. She was discharged from the hospital on day 10. The patient was followed-up in the obstetric and hematology clinic and was planned for bone marrow transplant at later date.

Discussion

Thrombocytopenia is the second most common hematologic abnormality during pregnancy and is usually a benign condition. Some patients, however, will have chronic medical disorders or pregnancy-induced conditions that require further evaluation and therapy.

Thrombocytopenia is classically defined as a platelet count of less than 150,000/L [Table 1].[2-4] Counts for 50,000-100,000/L are moderately depressed, and less than 50,000/L are severely depressed.[5] Our patient was a diagnosed case of hypocellular bone marrow with severe thrombocytopenia with PIH. This disorder is characterized by pancytopenia and bone marrow hypocellularity.[6,7] Immunomediation has been postulated as the most probable underlying factor for this disease.[6] The causes of this disease can be broadly divided as acquired and inherited; however, more than 80% of the cases are acquired. Pregnancy, PIH and use of methyldopa have been identified as the acquired causes. Pregnancy appears to have a close link with this disease as many reports indicate improvement of blood counts with the termination of pregnancy. There are reports to indicate that pre-existing thrombocytopenia is also known to worsen during pregnancy.

Termination of pregnancy in the severe form of the disease is recommended since the maternal mortality has been reported to be 20-60% and the decision to terminate should be collectively taken by the obstetrician, anesthesiologist, and hematologist in order to save the patient from this grave illness.[8,9] Furthermore, it has also been suggested that the maternal survival rate was better in pregnant mothers who had pre-existing thrombocytopenia prior to conception than when identified during the course of pregnancy.[10] The fetal outcome was predicted to be poor as this disease had been diagnosed during pregnancy and the intensity of the

Table 1: Cause of thrombocytopenia during pregnancy[2-4]

Gestational thrombocytopenia
Pregnancy-induced hypertension
HELLP syndrome
Spurious thrombocytopenia
Human immunodeficiency virus infection
Immune thrombocytopenic purpura
Systemic lupus erythematosus
Antiphospholipid syndrome
Hypersplenism
Disseminated intravascular coagulation
Thrombotic thrombocytopenic purpura
Hemolytic uremic syndrome
Congenital thrombocytopenia
Medication
Folate deficiency
Primary bone marrow dysfunction
Leukemia
Aplastic anemia

HELLP=Hemolysis, elevated liver enzymes, and low platelets

disease was severe according to the criteria. Though bone marrow transplant is widely accepted in the treatment of thrombocytopenia, it is contraindicated in pregnancy as it provokes the use of high doses of immunosuppressive drugs in order to prevent graft-versus-marrow-reaction. Furthermore, the use of Antithymocyte Globulin (ATG) or anti lymphocyte globulin should be used with caution as it is a category C drug.[11] However, there is an associated risk of thrombocytopenia with these drugs; therefore, platelet transfusion should be administered.

In the absence of obstetric complications, vaginal delivery would be the route of choice in these patients as there would be no surgical incision if episiotomy is avoided and uterine myometrium is intact minimizing the risk of bleeding. In addition, as these patients are more prone to infections, the risk of sepsis would be minimal in vaginal delivery compared to cesarean section, but it could be rather difficult to optimize the patient and platelet transfusion within a short time frame if vaginal delivery was planned. However, as our patient started leaking per vaginally and USG Doppler showed IUGR and intermittent absent end diastolic flow, she was posted for emergency LSCS before which adequate units of blood and single donor platelets were arranged.

General anesthesia was preferred over regional anesthesia as there is a risk of spinal hematoma. Furthermore, it is easier to manage severe blood loss when a patient is under general anesthesia and well oxygenated. For a major surgery, a platelet count of 50×10^9/L is optimal.[10] However, this optimal level of platelet count could not be achieved despite multiple platelet transfusions. It is imperative to provide adequate supportive therapy during the post-operative period by repeated blood and platelet transfusions to ensure adequate maternal Hb of 8 g/dL and the platelet count of 20×10^9/L.[12] However there is a risk of cross immunization associated with repeated platelet transfusions. Therefore, single donor platelets would be preferred. We maintained Hb of more than 8 g/dL performing repeated blood and platelet transfusions. However, platelet came to 28000 on 2nd post-operative day. Infection was prevented by the use of antibiotics and barrier nursing.

Thrombocytopenia in pregnancy is a life threatening condition both to the mother and the fetus, the outcome of the pregnancy depends on supportive therapy aiming to achieve an adequate platelet count and Hb concentration and taking precautions against infection.[13] The mode of delivery of the fetus and the anesthetic technique, if operative delivery is chosen, should be tailored individually for each patient in order to ensure favorable maternal and fetal outcome. These aspects can be achieved by the collective decisions taken by the obstetricians, hematologists and anesthesiologists.

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