Case Report

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Neuraxial Anesthesia in a COVID -19 Positive Pre-Eclamptic Parturient with Thrombocytopenia for Emergency Cesarean Section: An Anaesthetic Challenge

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Abstract

Background: Background: With the increasing number of Coronavirus disease (COVID- 19) cases globally, we are faced with an unprecedented challenge of safe anesthetic management of parturient and health care personnel alike. Neuraxial anesthesia is the recommended choice for cesarean delivery in the COVID positive parturient unless otherwise contraindicated. The clinical manifestations of COVID-19 include Thrombocytopenia (Platelet count less than 150 × 109/L) and may influence the decision to administer neuraxial anesthesia for the fear of epidural hematoma. Other causes of thrombocytopenia in pregnancy include hypertensive disorders, gestational thrombocytopenia, and immune causes.

Case: In this case report, we have reviewed and presented the anesthetic management of a COVID-19 positive, pre-eclamptic parturient with thrombocytopenia posted for an emergency cesarean section.

Conclusion: The safe limit for platelet count for administering neuraxial anesthesia in COVID-19 positive parturient needs to be reconsidered and the single-shot subarachnoid block offers a safer alternative.

Keywords: COVID-19; Neuraxial; Anesthesia; Pre-eclampsia; Thrombocytopenia; Cesarean section

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Introduction

The mean platelet count decreases by about 20% during normal pregnancy and 5.8% of all parturients have counts below 100 × 109/L [1]. Gestational thrombocytopenia accounts for 70%-80% of thrombocytopenia in parturients while hypertensive disorders and immune thrombocytopenic purpura account for approximately 20% and 3%-4% cases respectively [2]. Thrombocytopenia is a common hematological finding observed in approximately one-third of Coronavirus disease 2019 (COVID-19) affected patients [3]. In COVID 19 affected parturients, thrombocytopenia has significant implications regarding the performance of safe neuraxial block and intraoperative blood loss, especially when urgent decisions about surgical delivery are to be made. We present our experience of a case with thrombocytopenia in a COVID positive pre-eclamptic parturient who presented for an emergency Cesarean Section (CS).

Case Report

A 28-year-old Gravida 2, with 39 weeks of gestation was posted for cesarean section i/v/o previous LSCS, with breech presentation in labour. The parturient was a diagnosed case of pre-eclampsia on Tab Labetalol 200 mg BD with COVID-19 positive status having low-grade fever and mild cough. Pre-anesthetic workup revealed severe thrombocytopenia with a manual platelet count of 43000/mm^3. The coagulation panel values were PT-10.1 seconds, INR-0.87, APTT-36.2 seconds, Fibrinogen-533 mg/dl, and D-Dimer value of 343 ng/ml.

Because of the low platelet counts, four units of platelet concentrates were transfused over 90 minutes pre-operatively; 30 minutes before starting the surgery, and a repeat platelet count was sent, which was 54,000/mm^3. Another four units were arranged to be transfused intra-operatively. The patient wore an

N-95 mask and was shifted to the dedicated COVID operating area through the pre-defined corridors.

After the application of standard ASA monitors and co-loading with the Ringer Lactate (RL) solution, single-shot Subarachnoid Block (SAB) was administered in the L3-4 interspace using 27 gauge Whitacre needle with 1.8 ml hyperbaric bupivacaine and 10 µg fentanyl. A sensory level of T4 was achieved. Intra-operatively the patient was transfused four units of random donor platelets and 1.5 liters of RL.

Intra-operative hemodynamics remained stable with no additional need for vasopressors or fluid boluses. A healthy baby was delivered within 10 minutes of the block, cried immediately, and had 5 minutes APGAR score of 9. The total blood loss and urine output intra-operatively was estimated at around 800 ml-1000 ml and 200 ml respectively. The surgery lasted for 90 minutes with stable vitals on shifting and a residual block level of T8.

Post-operative Hb was 10.4 g/dl with a Platelet count of 1.02 lakh/mm^3. The patient regained full motor and sensory function on recovery from SAB with no delayed neurological sequelae. She tested negative for COVID-19 eight days after the CS when she was discharged from the hospital **(Table 1 and Figure 1)**.

Table 1: Platelet count trends in the patient.

	Pre-operatively :Pretransfusion	Preoperatively :Post transfusion	Postoperative
Days	Day 1	Day 1	Day 2
Platelet units recieved	4 Units preoperatively	4 Units intraoperatively	None
	43000/mm^3	54000/mm^3	1.02 lakh/mm^3

Figure 1: Single shot spinal anaesthesia administration.

Discussion

Thrombocytopenia has been reported in about one-third of COVID-19 infected patients and is a risk factor for increased morbidity and mortality [3]. The mechanisms postulated for the thrombocytopenia include either direct bone marrow inhibition, immune-mediated destruction via a cytokine storm, or platelet aggregation in the lungs [4]. The other common causes of thrombocytopenia in the parturient are gestational thrombocytopenia (70%-80%), hypertensive disorders of pregnancy (20%), and Immune Thrombocytopenic Purpura (ITP) (3%-4%) [2]. Our patient being pre-eclamptic, the cause of thrombocytopenia could have been either pre-eclampsia, COVID infection, or both. Regional Anesthesia (RA) is the preferred mode of anesthesia in a COVID-19 parturient. It maintains respiratory function and dynamics in a patient with respiratory compromise. It avoids aerosol-generating procedures required in General Anesthesia (GA) with reduced risk of viral transmission in the health care workers. Additionally, it is less resource-intensive compared to GA [5].

However, the safety of regional anesthesia in the presence of thrombocytopenia has been controversial, due to the risk of neuraxial hematoma. There is also a potential risk of encephalitis and meningitis with a subarachnoid block in an untreated viremic COVID patient. Although, there is ambiguity regarding the lower values of Platelet count for the safe conduct of anesthesia, in the parturient, platelet count of 70,000 × 106/L is considered to be low risk, and even lower levels can be considered for those at high risk for general anesthesia [6].

A Multicenter peri-operative outcomes group defined the risk of epidural hematoma in thrombocytopenic parturient with the upper 95% confidence interval for a platelet count 0/mm^3-49,000/mm^3 as 11%, for 50,000/mm^3-69,000/mm^3 as 3%, and for 70,000/mm^3-100,000/mm^3 as 0.2% [6]. Orlikowski et al have recommended the use of Thromboelastography (TEG) and suggested that a maximal amplitude of 53 mm in TEG correlates with a platelet count of 54000/mm^3 at which level the coagulation will be adequate [7]. Concerning transfusion guidelines in pre-eclamptic patients, RCOG and various studies [8] consider a target platelet count of 50 × 109/L for safe cesarean delivery and recommend transfusion of blood products including platelet concentrates before delivery and/or in the immediate postnatal period. These findings suggest a safe lower cut-off for platelets in selected cases. However, concerning thrombocytopenia in COVID, there is currently limited evidence of prophylactic transfusion in ICU settings with active bleeding and DIC. In a recent case report, SAB was administered under cover of platelet transfusion with safe outcome in a COVID positive parturient with a platelet count of 24,000 × 106/L who presented for emergency cesarean section [9].

Our decision to administer SAB was based on the emerging evidence of safe outcome with platelet levels of >50,000 mm^3 in the parturient and the need to avoid GA with its potential for worsening respiratory compromise and risk of viral transmission amongst healthcare workers. Thrombocytopenia is a marker of severity of disease in the COVID infected patients and even though our patient had mild clinical manifestations, GA with mechanical ventilation could have been detrimental to the worsening of the respiratory parameters.

Conclusion

To conclude, severe thrombocytopenia can occur in a COVID-19 positive parturient even with mild symptoms. In a COVID infected parturient with platelet levels >50,000/cumm, administration of single-shot SAB is a safer alternative to General anesthesia and should be considered as a suitable alternative.

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