

CASE REPORT

Acute Asthma Exacerbation and Thrombocytopenia in Pregnancy: an Emergency Cesarean Case Report

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ABSTRACT

Background: Asthma exacerbation and thrombocytopenia during pregnancy present significant anesthetic challenges, particularly when urgent cesarean delivery is required. In addition, acute asthma exacerbation may compromise maternal oxygenation and necessitate immediate airway control. In such complex conditions, anesthetic management must be individualized to optimize maternal and fetal outcomes.

Case Illustration: We report the case of a 26-year-old pregnant woman (G4P1021) at 38 weeks and 4 days of gestation who was referred with premature rupture of membranes, acute asthma exacerbation, and severe thrombocytopenia. On admission, the patient had mild wheezing, respiratory rate of 24 breaths per minute, and oxygen saturation ranging from 93–96% on room air. Laboratory evaluation revealed severe thrombocytopenia with a platelet count of $38 \times 10^9/L$ and mild anemia (hemoglobin 9.7 g/dL). Preoperative optimization included nebulized salbutamol and intravenous corticosteroids. Due to the high risk of spinal or epidural hematoma and the potential for respiratory deterioration, general anesthesia with rapid sequence induction and intubation was selected. Ketamine and propofol were used for induction to provide bronchodilation, hemodynamic stability, and reduced airway reactivity. Anesthesia was maintained with propofol infusion, fentanyl, and rocuronium. The cesarean delivery proceeded uneventfully without intraoperative bronchospasm or hemodynamic instability.

Conclusion: This case demonstrates that in obstetric emergencies complicated by acute asthma exacerbation and severe thrombocytopenia, general anesthesia can provide safer airway control and hemodynamic stability when regional anesthesia is contraindicated.

Keywords: Asthma exacerbation; Emergency cesarean section thrombocytopenia; Obstetric anesthesia ; Pregnancy.



INTRODUCTION

Asthma and thrombocytopenia individually pose significant risks in pregnancy, complicating anesthetic management during labor and delivery. Asthma exacerbations during pregnancy are associated with increased maternal and fetal morbidity, including preterm labor, preeclampsia, and low birth weight infants. Uncontrolled asthma can lead to maternal hypoxia, increasing fetal distress and necessitating urgent surgical interventions such as emergency cesarean delivery.¹ Thrombocytopenia, defined as a platelet count below $150 \times 10^9/L$, occurs in approximately 10% of pregnant women and can significantly affect anesthetic choices due to the increased risk of hemorrhagic complications, especially when neuraxial anesthesia is considered. The most common causes of thrombocytopenia in pregnancy include gestational thrombocytopenia, immune thrombocytopenic purpura (ITP), and preeclampsia-associated thrombocytopenia.^{2,3}

Anesthetic management in such scenarios must balance maternal safety, airway control, respiratory stability, and the prevention of bleeding complications. Traditionally, regional

anesthesia (RA) is preferred for cesarean deliveries due to fewer respiratory complications and better maternal and fetal outcomes.⁴ However, severe thrombocytopenia and active respiratory compromise may necessitate general anesthesia (GA), given the immediate airway control, bronchodilatory options, and better hemodynamic management. This case report discusses anesthetic considerations and illustrates why general anesthesia was preferred over regional anesthesia for an emergency cesarean delivery in a patient with acute asthma exacerbation and severe thrombocytopenia.^{2,5}

CASE ILLUSTRATION

A 26-year-old pregnant woman (G4P1021) at 38 weeks and 4 days of gestation weighing 68 kg, was referred from a regional hospital with severe thrombocytopenia despite transfusion of 30 units of platelet concentrate. On arrival, she presented with premature rupture of membranes, acute asthma exacerbation, and severe thrombocytopenia (platelet count $38 \times 10^9/L$). Preoperative assessment showed heart rate 82 bpm, respiration rate 24 breaths per minute, mild wheezing without chest retraction, oxygen saturation ranged 93–96% on

room air, and mild anemia (Hb 9.7 g/dL). Fetal evaluation demonstrated a grade I cardiotocography with fetal heart rate 156 bpm. Given the risk of intraoperative respiratory deterioration, pulmonology and internal medicine consultations advised respiratory optimization with nebulized salbutamol and intravenous methylprednisolone. Her obstetric history included one prior successful cesarean delivery, which had been complicated by asthma exacerbation and managed successfully under regional anesthesia.

Considering the patient's severe thrombocytopenia and the high risk of spinal or epidural hematoma with regional anesthesia, general anesthesia with Rapid Sequence Induction and Intubation (RSII) was chosen. Premedication consisted of ranitidine 50 mg IV and metoclopramide 10 mg IV, administered 30 minutes prior to surgery. Preoxygenation with 100% oxygen was provided for 5 minutes before intubation. Induction was initiated 1 minute prior to intubation using ketamine 50 mg IV, propofol 50 mg IV, and rocuronium 50 mg IV. Pre-induction vital signs were blood pressure 138/76 mmHg, heart rate 98 bpm, respiratory rate 24 breaths per

minute, and oxygen saturation 98%. Intubation was performed smoothly with meticulous airway management. Anesthesia was maintained with continuous propofol infusion, supplemented by fentanyl for analgesia and rocuronium for muscle relaxation. Intraoperatively, vital signs remained stable, with blood pressure ranging from 92–129/62–91 mmHg, heart rate 89–98 bpm, oxygen saturation 96–99%, and end-tidal CO₂ 33–34 mmHg. Estimated blood loss was approximately 1200 mL, which was effectively managed with transfusion of packed red cells and colloid fluids.

DISCUSSION

This case report presents a patient with acute asthma exacerbation and severe thrombocytopenia in pregnancy, a rare but potentially life-threatening combination that necessitates rapid and precise anesthetic decision-making. Each condition independently alters the risk–benefit profile of anesthetic techniques, but together they present conflicting management priorities.

From a pathophysiological standpoint, asthma in pregnancy can be influenced by hormonal, mechanical, and immunological changes. Elevated

progesterone levels exert a smooth muscle-relaxant effect, which may improve baseline airway tone, but increased circulating eosinophils and heightened airway responsiveness can predispose to bronchospasm. Acute exacerbations, often triggered by infection, allergens, or environmental irritants, can cause significant maternal hypoxemia and hypercapnia, impairing fetal oxygenation and leading to acidosis. Hypoxia is particularly detrimental in pregnancy due to the leftward shift of the maternal oxyhemoglobin dissociation curve and the fetal dependence on adequate maternal PaO₂.^{1,6,7}

Thrombocytopenia in pregnancy has diverse etiologies, ranging from benign gestational thrombocytopenia to immune-mediated and hypertensive disorders. Severe thrombocytopenia (<50×10⁹/L) is uncommon and is associated with increased perioperative hemorrhagic risk, particularly when surgical delivery is required. In the neuraxial anesthesia context, this platelet deficit greatly increases the risk of spinal or epidural hematoma, a catastrophic complication with potential permanent neurological sequelae. Although platelet transfusion may

temporarily raise platelet counts, the increment is often unpredictable in immune-mediated thrombocytopenia or consumptive coagulopathies.⁸

Regional anesthesia, typically preferred in obstetric practice due to lower respiratory risks, posed significant complications in this case. The primary concern regarding regional anesthesia was the potential for spinal or epidural hematoma, a rare but devastating complication in severe thrombocytopenia. Existing guidelines suggest platelet thresholds between 70×10⁹/L to 80×10⁹/L for safe neuraxial anesthesia. With a platelet count as low as 38×10⁹/L, general anesthesia was indicated to avoid severe neurological complications.^{2,9,10}

Another relevant consideration is the hemodynamic impact of each anesthetic technique. Spinal anesthesia can produce sudden hypotension due to sympathetic blockade, potentially compromising uteroplacental perfusion, while general anesthesia allows more controlled hemodynamic modulation through titrated induction and maintenance agents.¹

General anesthesia in asthmatic patients must be approached cautiously. Airway hyperresponsiveness increases

risk for bronchospasm, particularly during intubation and extubation.^{11,12} Additionally, the acute asthma exacerbation further complicated anesthetic management. Click or tap here to enter text. Asthma exacerbations during pregnancy can result in hypoxia, leading to fetal distress and necessitating rapid airway control, which is more reliably achieved under general anesthesia.¹³ Ketamine and propofol were selected for induction because ketamine provides potent bronchodilation and preserves airway reflexes while maintaining cardiovascular stability, which is particularly advantageous in asthmatic patients, whereas propofol offers a rapid, smooth induction with reduced airway reactivity and predictable hemodynamic control, thereby minimizing the risk of bronchospasm and circulatory compromise during cesarean delivery.¹⁴

The selection of anesthetic drugs in asthmatic patients is crucial. The avoidance of histamine-releasing agents like atracurium is also critical to reduce the likelihood of bronchospasm, thus Rocuronium was preferred over atracurium.⁵

Postoperative pain management also required careful consideration. Multimodal analgesia, including intravenous ketamine and fentanyl, minimized opioid requirements, thereby reducing risks of respiratory depression, a significant concern given the patient's respiratory status. In this patient, morphine was avoided due to its potential to induce histamine release and precipitate further exacerbation, while non-selective NSAIDs were also withheld because COX-1 inhibition can trigger leukotriene-mediated bronchospasm in individuals with NSAID-exacerbated respiratory disease. Additionally, comprehensive postoperative care in the ICU provided the necessary surveillance to detect and manage any complications promptly.¹²

Multidisciplinary collaboration involving obstetricians, anesthesiologists, hematologists, and pulmonologists was pivotal to the successful outcome. This integrated approach ensured timely identification of risks, appropriate preoperative stabilization, safe intraoperative management, and effective postoperative care.¹⁵

CONCLUSION

In conclusion, while regional anesthesia remains preferable in obstetric practice for most cesarean deliveries, this case illustrates that in the setting of severe thrombocytopenia and acute asthma exacerbation, general anesthesia may be the safer choice. The key lies in meticulous preparation, selection of drugs tailored to the patient's pathophysiology, and vigilant postoperative monitoring to ensure favorable maternal and neonatal outcomes. Individualized anesthetic planning and multidisciplinary coordination are essential to managing complex obstetric emergencies safely, ensuring optimal maternal and neonatal outcomes.

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