



Successful Management of a Suspected Case of Meperidine-Induced Anaphylaxis in Cesarean Delivery

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Abstract

Introduction: Meperidine is known as the gold standard drug for shivering after spinal anesthesia (SA). This drug has been used widely and safely during the Cesarean Section (CS).

Case Presentation: This case report presents an anaphylaxis reaction to a single intravenous dose of 25 mg meperidine, aiming to control shivering during CS under SA a few minutes after surgical incision.

Conclusions: The condition was well managed with timely intervention. This rare fetal reaction to meperidine is worthy of reporting to make the medical team aware of the potential risks of anaphylaxis due to many routine safe drugs.

Keywords: Meperidine, Anaphylaxis, Cesarean Delivery

1. Introduction

Anaphylaxis during the Cesarean Section (CS) involving respiratory, gastrointestinal, cardiovascular, and central nervous systems is a rare but life-threatening event for both the mother and neonate (1). During anesthesia, the anaphylaxis reaction is expected when drugs such as antibiotics, muscle relaxants, and NSAIDs with known potential risks for this adverse event are administered (2). This life-threatening condition may happen unpredictable, and consequently, the anesthesiologist maybe not be prepared for it. Meperidine is a synthetic opioid of the phenylpiperidine class that acts through μ and kappa receptors (3). It has been successfully used with no significant adverse effects during CS in both general and regional anesthesia (4, 5). Studies have described its common side effects, including nausea, vomiting, hypotension, purities, and respiratory depression, but not anaphylactic reactions (6). Indeed, meperidine has not met the requirements that have been considered for antibiotics and other well-known anaphylaxis triggers (7). To date, meperidine-induced anaphylaxis has not been reported.

2. Case Presentation

A 32-year-old woman was scheduled for elective CS under spinal anesthesia (SA) at 38 weeks of gestation. The physical examination and medical history did not reveal any significant findings. She had a history of uneventful CS under SA two years ago. She had no history of any drug or food allergy. She underwent routine monitoring and started to receive intravenous crystalloids. In a stable hemodynamic status (HR = 90 per minute, respiratory rate = 18 per minute, BP = 135/85, and SaO₂ = 99% in room air and temperature 37.1°C), SA was performed in a sitting position with 12 mg of 0.5% hyperbaric bupivacaine. After a few minutes in the supine position, she developed severe shivering, and 25 mg intravenous meperidine (Pethidine-Exir Company-Iran-50MG/1ML AMP) was injected quickly. Immediately, she became restless and complained of flashing, shortness of breath, burning, itching, chest tightness, and urticarial rash development. Then, maternal blood pressure and heart rate changed to 65/40 mmHg and 120 per minute, respectively. Despite the unstable conditions, oxygen saturation remained 90% with a face mask and a high flow of 100% oxygen (6 L/min). A prompt treatment started, and the obstetric team was informed of the fetal

status and the need for an emergency delivery. The senior was called, and a male neonate was delivered with the Apgar scores of 7 and 9 at 1 and 5 min, respectively, within five minutes after the onset of anaphylaxis. Considering the highly suspicious of anaphylaxis and liberal hydration, the Trendelenburg position was performed, and an intravenous bolus of 100 μ g adrenaline was injected and repeated. When her vital signs dramatically recovered after adrenaline administration, the diagnosis was strongly made. Fortunately, the operation came to the end uneventually. Due to the potential risk of late adverse effects related to anaphylaxis, she was transferred to the Intensive Care Unit (ICU). The tryptase serum level was checked, and the increased values also confirmed the diagnosis. No recurrence was reported. Informed consent was obtained from the patient. For safe future medical management, she was advised to inform her physicians of the disastrous event that occurred after meperidine injection.

3. Discussion

Based on the current evidence, cesarean delivery and history of any allergic reactions could be the potential risk factors for anaphylaxis (8). Prognosis depends on early recognition and timely management. It is supposed that due to the raised progesterone level during pregnancy, immunologic status changes in pregnant women, possibly leading to more predisposition to anaphylaxis (9). Here, an anaphylaxis case in CS highly suspected to be induced by meperidine was described. In this case, the recognition of anaphylaxis could be made earlier than general anesthesia (GA). Furthermore, the diagnosis of the real trigger was more difficult under GA because most of the anesthetic drugs are implicated in an anaphylactic reaction (10).

It should be noted that during anesthesia, the patient is covered with drapes, and most of the patients are sedated; therefore, early signs and symptoms are missed. The problem is much more highlighted in CS because hypotension as the key feature of anaphylaxis and tachycardia can also be seen in other conditions such as peripartum cardiomyopathy, amniotic fluid embolism, and aspiration. Therefore, when blood pressure drops in these cases, it is vital to confirm a certain diagnosis and rule out anaphylactic reactions because the treatment approaches are different (11).

It is indicated that histamine release induced by opioids in routine dosage does not provoke anaphylactic reactions in healthy individuals. In our case, serum tryptase concentration was increased, which cannot differentiate between anaphylactic and anaphylactoid reaction; how-

ever, managing both conditions is the same (7). Searching the literature, no serious reaction to meperidine was found during pregnancy or other conditions. We point to a few case-reports in this regard in the following. Sripriya et al. (10) reported an anaphylaxis reaction due to ranitidine during CS. Takahashi et al. (12) reported a case of cesarean delivery under combined spinal-epidural anesthesia that was affected by severe anaphylaxis reaction induced by bupivacaine. In their study, delivery was done after 18 minutes, so the first minute Apgar score was 2, and the neonate was intubated. Some precautions are considered about epinephrine administration in pregnancy, including fetus hypoxic damage due to uterine vasoconstriction, pulmonary edema, and ventricular arrhythmia (9). Takahashi et al. (12) used epinephrine, but it could not justify the neonate's poor condition. We also tried this drug because of no response to ephedrine, deterioration of the patient's condition, and the assurance of immediate delivery. Two studies differ in aspect of the time between the onset of anaphylaxis and delivery. Yamaoka et al. (13) reported a 36-year-old primigravida during an elective CS that developed severe anaphylaxis two minutes after rocuronium injection, managed with rapid and successful treatment. Jeon et al. (9) reported a case of anaphylactoid shock following cefotetan injection. It is indicated that when anaphylaxis occurs during CS, the fetus is highly at risk of intrapartum asphyxia, central nervous system damage, encephalopathy, developmental disorders, and even death. The American College of Obstetricians and Gynecologists indicates that when anaphylaxis occurs, maternal stability does not guarantee fetal oxygenation. Previous case reports about anaphylaxis in pregnant women demonstrated that 46% of neonates were affected by neurologic adverse effects (12). In this case, both mother and neonate were discharged in healthy conditions. However, as the fetus's developing central nervous system is prone to neurotoxicity and apoptosis (14), we are not sure about the long-term neonatal neurologic outcomes, which could be a limitation of this paper. Studies demonstrate that even previously safe administration of a drug does not guarantee the safety of the next administration (9). Moreover, more than 90% of these cases during pregnancy had no clear history of drug or food allergy (8). Thus, great caution should be paid to early diagnosis and intervention while all the required equipment is available. As another notable issue in this paper, due to the well-known side effects of meperidine and several options to suppress shivering during CS, it is wise to restrict meperidine use for this purpose in pregnant women.

3.1. Conclusions

This case report emphasizes that both the anesthesiologist and obstetrician should always be prepared to face anaphylaxis even when no history or clear risk factor exists.

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Footnotes

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