



Cardiac arrest during cesarean section - A case report

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Received: 10 September 2019,

Reviewed: 28 September, 23 October 2019,

Revised: 24 October 2019,

Accepted: 28 October 2019

ABSTRACT

Cardiac arrest is relatively an uncommon event during cesarean sections. That's why obstetric teams have low exposure to these critical situations and need frequent training in early identification, differential diagnosis and treatment. We present a case report of a 36-year-old woman, who underwent cesarean section under spinal anesthesia due to delayed labor progress. Once the skin incision was performed the patient underwent asystole. There is a wide range of etiologies for maternal cardiac arrest. We describe and analyze the possible etiologies that could have led to cardiac arrest in this particular case.

Key words: Amniotic fluid; Bezold Jarisch reflex; Cesarean section; Cardiac arrest; Spinal anesthesia

Citation: Germanova L, Czajkowska K, Gomes J, Infante C, Castro M, Martins I. Cardiac arrest during cesarean section - A case report. *Anaesth pain & intensive care* 2019;23(4):392-394, DOI: 10.35975/apic.v23i4.1172

INTRODUCTION

Cardiac arrest is a rare event during cesarean section occurs unexpectedly and needs an adequate and immediate response from the surgical and anesthetic team. Prompt and adequate cardiopulmonary resuscitation increases the chances of survival for both the mother and the child.¹ As the resuscitation is being performed the clinicians must review the differential diagnosis in the light of standard protocols given in every advanced life support course and continue with adequate treatment. In this paper we describe the case of a cardiac arrest during cesarean delivery to discuss the current knowledge regarding its etiologic factors.

CASE REPORT

A 36-year-old healthy primigravida of 40 weeks, underwent cesarean section due to failure in labor progress. Prior to the surgery her hemoglobin was 11.8 g/dL and her vital signs were within normal limits. A combined *spinal-epidural anesthesia* was performed with 1.5 mL of hyperbaric bupivacaine 0.5% + 2.5 µg of sufentanil. The patient was positioned in a left lateral tilt and 750 mL of crystalloid solution was administered intravenously. Her vital signs remained stable after administration of the spinal until the obstetrician was ready to give the skin incision. Immediately before the beginning of the surgery the

patient became unconscious, her heart rate dropped and she developed apnea within seconds. The electrocardiogram showed bradycardia followed by asystole. The anesthesia team immediately initiated advanced life support. First 0.5 mg IV (intravenous) of atropine was administered, followed by 1 mg IV of epinephrine. Chest compression was started and oxygenation was continued. The total time of cardiac arrest and chest compressions was 2 minutes, after which the patient regained full consciousness. A subsequent neurological examination confirmed complete recovery without any residual damage. The neonate did not suffer from any complications during the delivery, and cried well.

DISCUSSION

This case describes an approach for the cardiac arrest during a cesarean section.

The prevalence of cardiac arrest during pregnancy is 1 in 30,000 and it is even rarer in the intraoperative period. The UK Confidential Enquiry into Maternal Deaths report for the 2003–5 triennium noted 52 women who had undergone perimortem caesarean section (PMCS), and the number of women managed with PMCS had doubled since the previous report.² According to the World Health Organization (WHO) obstetric hemorrhage is the world leading cause of maternal mortality (24%).³ It can complicate with severe hypovolemia and cardiac arrest. However, in our case there was no question of any bleeding, as at the moment of the cardiac arrest no incision had been given, and there was no vaginal bleeding either.

A second contributor to maternal death can be preeclampsia, often complicated by eclampsia, pulmonary edema, cardiac dysfunction, cerebral edema and HELLP (hemolysis, elevated liver enzymes, low platelet count) syndrome.⁴ However, in this case the patient did not have preeclampsia.

Another possible explanation of sudden cardiac arrest is an amniotic fluid embolism. The diagnosis is difficult and often can only be made during the autopsy. Amniotic fluid embolism is thought to result from maternal anaphylactic reaction to fetal material entering the pulmonary circulation that causes apnea, hypotension and bradycardia.⁵⁻⁷

Also, complications related to spinal anesthesia need to be considered. Spinal anesthesia is associated with the highest occurrence of cardiac arrest during cesarean section compared with other anesthetic techniques. Risk factors include cardiac history, age

below 50 years, baseline heart rate under 60 beats per minute, the use of beta blockers and spinal anesthesia level above T6.⁸ The Bezold-Jarisch reflex should be considered in the differential diagnosis. This reflex is an inappropriate vasovagal response, and results in cardiovascular reflex depression caused by vasodilatation and bradycardia. During general or neuraxial anesthesia, induced sympathectomy may result in a sudden vasovagal activation and/or an acute reduction in sympathetic tone leading to extreme bradycardia and vasodilatation. Trigger might be central, from physical stress or pain, or may be initiated peripherally by a reduction of venous return to the heart. This reflex bradycardia could be treated by administering atropine, ephedrine or epinephrine. Spinal anesthesia itself causes a significant change in the intravascular volume based on massive peripheral vasodilatation. Relevant reduction in venous blood return caused by a peripheral sympatholytic effect of spinal anesthesia could have been a trigger for the Bezold-Jarisch reflex.⁸⁻¹¹

Amniotic fluid embolism is also a possibility. However, the absence of early noticeable hypoxia before the arrest and a rapid recovery within two minutes, makes it highly unlikely in our case. The patients suffering from it usually need prolonged mechanical ventilation and ICU care.

In retrospective analysis of our case, none of the above-mentioned etiologic factors could be ascertained with reasonable accuracy. At the time of cardiac arrest, we had infused almost 750 ml of saline, there was no warning signs of bradycardia and /or hypotension. Rather, sudden loss of consciousness was followed by onset of bradycardia and then cardiac arrest.

CONCLUSION

The Bezold-Jarisch reflex is the most-likely diagnosis in this situation. Amniotic fluid embolism can be a cause. Perhaps, on many occasions we might find ourselves unable to know the real cause of a cardiac arrest, especially in patients who recover rapidly and uneventfully.

Conflict of interest: none.

Authors' contribution:

LG: treating physician, write

KC, IM: manuscript writing

JG, Cl: research and manuscript editing

6. MC: final review, concept

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