

Iatrogenic acute headache secondary to co-administration of ergometrine and phenylephrine during cesarean section: a case report

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Case report

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Abstract

Background Reversible cerebral vasoconstriction syndrome has been described as a syndrome of severe recurrent thunderclap headache in bilateral posterior, with or without other neurological symptoms and signs, is fully reversible by 3 months. Vasoconstrictor play an important role in the development of reversible cerebral vasoconstriction syndrome. Case presentation A 37-year-old pregnant women underwent elective cesarean section at 36+6 weeks gestation under combined spinal-epidural anesthesia . After a healthy female neonate was delivered, 0.2mg ergometrine was injected intramuscularly to induce uterine contraction. 30 minutes later, 0.1mg phenylephrine was given intravenously to treatment hypotension. Then she complained of a sudden headache and blood pressure was significantly risen to 163/104 mmHg versus baseline was 118/76 mmHg. Her severe headache was relieved 2 hrs after administering nitroglycerin, and headache did not recur after discontinued nitroglycerin. Conclusion The reason of hypotension should be identified in patients received ergometrine during cesarean section. Phenylephrine or other sympathomimetic should be used cautiously and vital signs should be observed closely for patient who received ergometrine during cesarean section. Nitroglycerin may be an alternative for the treatment of severe headache in reversible cerebral vasoconstriction syndrome.

Introduction

Reversible cerebral vasoconstriction syndrome (RCVS) is a group of disorders characterized by reversible vasoconstriction of the cerebral arteries, usually associated with severe recurrent thunderclap headache in bilateral posterior, with or without additional neurological symptoms and signs, which fully reversible in 3 months [1-3]. Previous treatment of RCVS was calcium channel blockers (CCBs) (orally or intravenously). However, headache and vasospasm recur after CCBs were discontinued [10]. Here we report a case of patient with RCVS was relieved by continued nitroglycerin infusion.

Case Presentation

A 37-year-old women, gravida 1, para 0, twin pregnancy, underwent elective cesarean section at 36+6 weeks gestation. The medical history and the physical examination revealed no abnormalities. The baseline blood pressure (BP) was 118/76mmHg, heart rate (HR) 83 times per minutes. The patient received combined spinal-epidural anesthesia (CSEA), after bilateral sensory block was T4, a healthy male and a healthy female neonate was delivered. After umbilical cord clamp, 0.2mg ergometrine (Brilliant 170303) was injected intramuscularly, 10u oxytocin (Harvest Pharmaceutical CO., LTD. 09171201) was slowly administered intravenously to induce uterine contraction. 30mins after ergometrine administered, BP was lower than 90/60mmHg, then 0.1mg phenylephrine (Harvest Pharmaceutical CO., LTD. 07171801) was administered intravenously. 4 mins later, she complained of a sudden severe occipital headache and BP was significantly risen to 163/104mmHg vs baseline was 118/76mmHg, HR was 91times per minute. Then headache developed to occipital and bilateral temporal soon. 50ug nitroglycerin (Beijing Yimin Pharmaceutical CO., LTD.20161014) was administered intravenously, and continuous infusion of nitroglycerin 0.02-0.05mg/Kg/hr was given. 45mins after

nitroglycerin administered, BP decreased to 136/88mmHg, and she feel a little relieved of headache. The brain computerized tomography(CT) scan was conducted immediately after the operation finished. CT showed no brain hemorrhage. Urinary protein test was negative. We recommended the patient to underwent brain magnetic resonance angiography for we suspected that the patient may had a RCVS. However, she refused to underwent MRA for economic reason. After transferred to obstetric ward, BP was maintained at 120-130/75-85 mmHg, HR was 60-70 times per minutes. Her headache was completely relieved 2 hours later, and BP was maintained at 115-125/70-80mmHg. She was discharged 3 days later without neurological deficits.

Discussion And Conclusion

The unexpected acute headache of our patient perhaps induced by co-administration of phenylephrine and ergometrine. The patient had no history of hypertension before and during pregnancy. The brain CT of our patient was normal, and the headache was reversed relieved 2hrs after administering nitroglycerine. We think our patients perhaps developed a RCVS, which is characterized by acute onset, severe recurrent headache, and severe headache usually abates after 1-3h [1,2]. RCVS, with or without other neurological symptoms and signs, is fully reversible by 3 months [1]. The typical patient with RCVS is a woman between the ages of 20-50 years old [6]. RCVS can occur during pregnancy or puerperium [6, 7]. Co-administration of Sympathomimetic drugs and Ergotamine or ergot derivatives could induce RCVS [1-3,8]. Sato S, et al reported a case of postpartum cerebral angiopathy associated with co-administration of two vasoconstrictive, methylergometrine maleate and sumatriptan [9].

Calcium channel blockers (orally or intravenously), are effective for the treatment of RCVS [10]. They are used as first-line therapy in some centers in patients with RCVS, because of the similarities with aneurismal subarachnoid hemorrhage [11]. However, in some cases, headache and vasospasm recur after CCBs were discontinued [10]. In our patient, BP was decreased 45mins after continued nitroglycerin infusion. Severe headache was relieved 2 hrs after administering nitroglycerin, vasospasm and headache did not recur after discontinued nitroglycerin. As the most commonly used antihypertensive drugs, the pharmacological mechanism of nitroglycerin is combined with -SH in vascular smooth cell to release nitric oxygen (NO), and NO mediated vascular smooth muscle relaxation [12]. Therefore, we consider that nitroglycerin may be an alternative for the treatment of severe headache in RCVS. Both nitroglycerin and calcium channel blockers inhibit the contraction of the uterine smooth muscle [13-14], postpartum hemorrhage should be concerned.

In consideration of the RCVS induced by co-administration of ergometrine and phenylephrine, the reason of hypotension should be identified in patients received ergometrine during cesarean section. During cesarean section, spinal anesthesia results in a rapid sympathetic vasomotor blockade: arteriolar vasodilation and decreased systemic vascular resistance [15]. Excessive loss of blood is also a main cause of hypotension. Colloid, crystalloid, Blood transfusion is the first choice for hypotension result from hypovolemia.

Phenylephrine, a direct α_1 -agonist, is recommended to maintain blood pressure during elective cesarean deliveries with spinal anesthesia [4,5]. Ergometrine acts directly on the uterine smooth muscle to prevent and treat postpartum hemorrhage. Ergometrine also has vasoconstrictive actions, resulting in hypertension as well as phenylephrine. Previous cases reported that phenylephrine or ergometrine caused severe headache [1,9,16,17]. To prevent the iatrogenic acute headache, Phenylephrine or other sympathomimetic should be used cautiously and vital signs should be observed closely for patient who received ergometrine during cesarean section.

In this case, the patient's acute headache perhaps caused by co-administration of phenylephrine and ergometrine and relieved by nitroglycerine infusion. For us, there were some apocalypses. Firstly, the reason of hypotension should be identified in patients received ergometrine during cesarean section. Secondly, Phenylephrine or other sympathomimetic should be used cautiously and vital signs should be observed closely for patient who received ergometrine during cesarean section. Lastly, nitroglycerin may be an alternative for the treatment of severe headache in RCVS.

Abbreviations

RCVS: reversible cerebral vasoconstriction syndrome BP: blood pressure

CSEA: combined spinal-epidural anesthesia HR: heart rate

CT: computerized tomography MRA: magnetic resonance angiography

CCBs: calcium channel blockers NO: nitric oxygen

Declarations

Ethic approval and consent to participate

Not applicable

Consent for publication

The written informed consent was obtained from patient for publication of the case report.

Availability of data and materials

All data related to this case report to are contained within the manuscript.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

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