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Case Report

Spinal anaesthesia for emergency Caesarean section in a parturient with acute subarachnoid haemorrhage

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Abstract

Introduction

Peripartum subarachnoid haemorrhage (SAH) is rare occurrence (observed to be between 5.8 and 17.1 per 100,000 deliveries). In this case report, we describe the management of a patient with acute SAH, who underwent emergency Caesarean section under spinal anaesthesia.

Case report

We present a case of a previously healthy, 30-year-old parturient woman; she was 37 weeks into her first pregnancy and presented with pounding headaches. She had a Glasgow Coma Scale (GCS) score of 15 without neurological deficits. Computed tomography revealed SAH without raised intracranial pressure. A multidisciplinary team comprising of neurosurgeons, obstetricians and anaesthesiologists, advised on an emergency Caesarean section prior to further neuroradiological procedures.

Spinal anaesthesia without sedation was selected for the avoidance of the hypertensive response during intubation, avoidance of airway manipulation and possible aspiration, as well as for provision of excellent analgesia and continuous monitoring of patient's GCS perioperatively.

Under standard monitoring and intra-arterial blood pressure monitoring, spinal anaesthesia was administered with hyperbaric bupivacaine 0.5%, 2.3 ml and fentanyl 15 mcg. Surgery proceeded uneventfully, patient remained haemodynamically stable and anaesthesia recovery was uncomplicated. Postoperative pain was managed with oral paracetamol, mefenamic acid and patient-controlled intravenous morphine. Satisfaction for anaesthesia was found to be high due to good maternal and foetal outcome.

Discussion

General anaesthesia for Caesarean section in patients with intracranial haemorrhage has been described. However, because of the rarity of the condition, there is no consensus with regards to optimal anaesthetic care. Despite the numerous advantages that spinal anaesthesia can offer, the authors did not find any precedent reports in the literature.

In addition to the known risks of the spinal anaesthesia, post-dural-puncture headache (PDPH) may be difficult to diagnose in a patient with existing headaches. Practitioners are required to remain vigilant, because worsening headache, due to PDPH, may confound the evaluation of re-bleed in intracranial aneurysm.

Conclusion

In a patient, with recent SAH and minimal neurological deficit undergoing emergency Caesarean section, spinal anaesthesia should be considered, as it has multiple advantages.

Introduction

Subarachnoid haemorrhage (SAH) in pregnancy is a rare event, occurring at a rate between 5.8 and 17.1 per 100,000 deliveries[1,2]. However, SAH still remains a major cause of indirect maternal mortality[3]. This cause is postulated because of the occurrence of aneurysmal or pial vessel rupture as a consequence of elevated arterial pressure. Thus, the importance of blood pressure control in parturient woman at risk of bleeds is paramount[1]. There is no consensus with regards to the optimal anaesthesia management for a parturient woman with acute SAH. We describe a case of a parturient woman, who underwent uneventful, urgent lower segment Caesarean section (LSCS) under spinal anaesthesia.

Case report

The patient was a 30-year-old Chinese female with no medical problems. At the time of her presentation, she was 37 weeks into her first pregnancy, which had been uneventful. She presented with a sudden onset pounding headache in the temporal region over the previous two days, which was associated with nausea and vomiting. She had no obstetric complaint, and foetal movements were found to be normal.

On admission, her heart rate was found to be 84/min, and blood pressure was 127/71 mmHg. Her score on the Glasgow Coma Scale (GCS) was 15 and there were no focal neurological signs (World Federation of Neurosurgeons' grade I)[4]. Full blood count and coagulation studies were observed to be normal. There was no clinical or laboratory evidence of pre-eclampsia. A plain computed tomography (CT) was performed, which showed an acute SAH within the prepontine cistern. Also, no hydrocephalus (Fisher grade 2)[5] was observed.

As the pregnancy was term, urgent delivery of the baby via Caesarean section was indicated to avoid the onset of labour and any associated

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elevations of blood pressure and intracranial pressure (ICP), which may aggravate the bleed. Further work-up for intracranial lesions while minimizing radiological exposure to the foetus would then be facilitated. The Caesarean section would then be followed by a contrast-enhanced CT angiographic study or a four-vessel study, with a view to coil any intracranial aneurysm, if present.

After a multidisciplinary discussion between neurosurgeons, obstetricians and anaesthesiologists, a consensus was made for an urgent Caesarean section under spinal anaesthesia with the patient's consent.

In addition to standard pulse oximetry, electrocardiogram and non-invasive blood pressure monitoring, a 20 G intra-arterial cannula was inserted into the patient's right radial artery to enable beat-to-beat monitoring of the arterial pressure and enable early intervention of haemodynamic variability. The patient was then placed in the right lateral position and cleaned and draped in a sterile fashion. Using a 27 G Whitacre needle and via the landmark technique, the space between the fourth and fifth lumbar vertebrae was accessed. At this level, cerebrospinal fluid (CSF) flow was not attained, and a second attempt at the interspace immediately above was successful on the first pass. Doses of 2.3 ml of hyperbaric bupivacaine 0.5% and 15 mcg of fentanyl were administered. The patient was immediately turned supine. There was a loss of sensation to cold up to the T5 dermatome. Skin incision proceeded 5 minutes after the spinal block had been given and surgical anaesthesia was completed.

The baby was delivered 10 minutes after the surgical incision was made. The operation, which took 40 minutes, proceeded uneventfully and the patient experienced no discomfort throughout. The intra-operative blood pressure and heart rate were maintained between 105/54–128/64 mmHg and 87–96 per minute. A total dose of 200 mcg of phenylephrine was used intra-operatively to prevent hypotension. Blood loss was minimal and the patient received 1 litre of crystalloids throughout the surgery. The patient was transferred directly to the neurosurgical intensive care unit from the operating theatre for continuous monitoring.

An hour later, a CT angiogram was performed, which did not demonstrate any aneurysm or other vascular abnormalities in the Circle of Willis. There was evidence of change in morphology of the SAH representing an on-going evolution.

On postoperative anaesthetic assessment, the spinal anaesthesia had receded around 6 hours after administration. Apart from the surgical wound, the patient complained of headache with a pain score of 2–3/10, similar to the prespinal pain score, which was controlled by patient-controlled analgesia (PCA) morphine as well as oral paracetamol and mefenamic acid. Satisfaction for the performance of anaesthesia was high due to good maternal and foetal outcome as well as optimal blood pressure control.

The patient was discharged from the intensive care unit to an intermediate care area on postoperative day 3. Four-vessel angiograms on the fourth postoperative day were found to be negative for vascular lesions. The patient was transferred to the general ward on postoperative day 6 and discharged home on postoperative day 7.

Discussion

Peripartum SAH provides a unique clinical challenge, because there is a requirement to consider both obstetric and neuroanaesthetic issues during management. A recent Cochrane Database systematic review has not shown that either regional anaesthesia (RA) or general anaesthesia (GA) for LSCS is superior with respect to major maternal or neonatal outcome measures[6]. However, the Royal College of Obstetrics and Gynaecology Triennial Confidential Enquiry into Maternal and Child Health (CEMACH) has demonstrated the multiple safety benefits of RA over GA. The Royal College of Anaesthetists audit book proposes that 95% of elective and 85% of emergency LSCSs should be performed under a regional technique. The main rationales for this recommendation include avoiding a difficult airway scenario and pulmonary aspiration[7].

General anaesthetic management of Caesarean section in a patient with intracranial haemorrhage has been described[8]. However, due to the rarity of the condition, no consensus has been reached with regards to optimal anaesthetic care. Despite the numerous advantages which spinal anaesthesia can offer, the authors did not find any precedent reports in the published literature on the use of this method for Caesarean section in a patient with SAH. The administration of a single shot of spinal block was based on the following maternal-foetal considerations: avoidance of airway manipulation and aspiration risk, minimization of foetal drug exposure, excellent postoperative analgesia, earlier return to oral intake and facilitation of maternal bonding with the new-born. Additionally, there were neurosurgical concerns regarding the possibility of an unsecured ruptured vascular lesion. A regional technique would enhance safety by preventing hypertensive responses to intubation and surgical stimuli as well as allow better perioperative monitoring for headache, focal neurological symptoms and GCS.

The major concern with central neuraxial blockade is the potential for cerebral herniation or worsening of intracranial haemorrhage in the setting of raised ICP, secondary to a rapid decrease in CSF pressure[3]. However, despite the evidence of raised elevated ICP being absent, the technique is reasonably safe. Indeed, lumbar puncture to diagnose SAH is

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indicated in the scenario of a negative CT scan when the clinical suspicion is high, or in centres which lack facilities for radiological detection of SAH. Intracerebral haemorrhage and SAH following subarachnoid block have been reported in the literature, but this appears to be a rare event and the pathophysiology is unclear[9]. To avoid the occurrence of an inadvertent dural puncture, an epidural technique was not selected because of the longer time of onset, relatively lower density of sensory blockade and increased risk of significant CSF leak or post-dural-puncture headache (PDPH).

A possible problem of a spinal block is the potential for sudden hypotension, which can not only compromise uterine perfusion, but also precipitate nausea and vomiting, which can aggravate raised ICP. In our patient, this was prevented by maintaining a narrow blood pressure margin with the use of small boluses of phenylephrine.

Patients with peripartum SAH generally present with headache. This can potentially confound diagnoses more commonly associated with pregnancy such as severe pre-eclampsia and PDPH. The latter is of particular concern for anaesthetists when assessing obstetric patients with atypical headaches after central neuraxial blockade. Conversely, worsening headache due to PDPH may confound the evaluation of a re-bleed. Fortunately, our patient did not experience this problem.

Conclusion

In this case report, a parturient woman, who developed acute SAH presented with complex clinical issues, which required multidisciplinary management. There is currently no consensus with regards to the best anaesthetic care for such patients undergoing urgent Caesarean section. Here we presented the case of a patient with SAH and minimal neurological deficit managed successfully under single shot spinal anaesthesia, demonstrating the myriad benefits and potential drawbacks of such a technique.

Abbreviations list

CSF, cerebrospinal fluid; CT, computed tomography; GA, general anaesthesia; GCS, Glasgow Coma Scale; ICP, intracranial pressure; LSCS, lower segment Caesarean section; PDPH, post-dural-puncture headache; RA, regional anaesthesia; SAH, subarachnoid haemorrhage.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

References

1. Bateman BT, Olbrecht VA, Berman MF, Minehart RD, Schwamm LH, Leffert LR. Peripartum subarachnoid hemorrhage: nationwide data and institutional experience. Anesthesiology. 2012 Feb;116(2): 324–33.
2. Jaigobin C, Silver FL. Stroke and pregnancy. Stroke. 2000 Dec;31(12):2948–51.
3. Wang LP, Paech MJ. Neuroanesthesia for the pregnant woman. Anaesth Analg. 2008 Jul;107(1):193–200.
4. Teasdale GM, Drake CG, Hunt W, Kassell N, Sano K, Pertuiset B, et al. A universal subarachnoid haemorrhage scale: report of a committee of the World Federation of Neurosurgical Societies. J Neurol Neurosurg Psychiatry. 1988 Nov;51(11): 1457.
5. Fisher CM, Kistler JP, Davis JM. Relation of cerebral vasospasm to subarachnoid hemorrhage visualized by computerized tomographic scanning. Neurosurgery. 1980 Jan;6(1):1–9.
6. Afolabi BB, Lesi FE, Merah NA. Regional versus general anaesthesia for caesarean section. Cochrane Database Syst Rev. 2006 Oct;18(4):CD004350.
7. Russell IF. Raising the standard: a compendium of audit recipes. Technique of anaesthesia for Caesarean sections. 2nd ed. London: Royal College of Anaesthetists; 2006.p166–167.
8. Samad K, Hasan SF, Hoda MQ. Anesthetic management of combined caesarean section and clipping of ruptured cerebral aneurysm. J Pak Med Assoc. 2004 Jun; 54(6):330–2.
9. Eggert SM, Eggers KA. Subarachnoid haemorrhage following spinal anaesthesia in an obstetric patient. Br J Anaesth. 2001 Mar;86(3):442–4.

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Repeat spinal anesthesia; Caesarean section; Kyphoscoliosis. Introduction. Kyphoscoliosis also known as â€œhunch backâ€ involves kyphosis, which is antero-posterior angulation and scoliosis, which is the lateral curvature, rotation of the vertebrae and rib cage deformity.Â Even though regional anesthesia is the preferred technique in a kyphoscoliotic parturient, there is high incidence of failure or patchy spinal block. A repeat spinal anesthesia with lesser volume of drug appears to be safe and should be considered as a reliable option after about 15-20 minutes of failed or partial 1st attempt block, if the maternal and foetal conditions allow as it helps avoid problems related to general anesthesia in such cases. A subarachnoid block is an effective way of providing anesthesia for cesarean sections. However, it can be considered relatively contra-indicated in parturients with uncorrected tetralogy of Fallot (TOF). We report a case of a 22-year-old female patient with TOF and gestational hypertension, who presented for an emergency cesarean section for placental abruption. The surgery was successfully conducted under a spinal anesthetic with a combination of low dose bupivacaine and fentanyl. Is general anaesthesia for caesarean section associated with postpartum haemorrhage? Systematic review and meta-analysis. Acta Anaesthesiol Scand 2013; 57:1092.Â Effects of epidural fentanyl on speed and quality of block for emergency cesarean section in extending continuous epidural labor analgesia using ropivacaine and fentanyl. J Korean Med Sci 2010; 25:287. Cherng CH, Wong CS, Ho ST. Epidural fentanyl speeds the onset of sensory block during epidural lidocaine anesthesia.