

# Unexpected cardiac arrest following spinal anaesthesia for elective caesarean section

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## Background

Cardiac arrest following regional anaesthesia for caesarean section though rare is the worst possible complication, especially so in a young parturient.

## Case Report

A 30 year old gravida3para2 with weight 77.9 kg, height 1.47m, BMI 36 at 39+1 weeks gestation, an ex-smoker with two previous uneventful caesarean sections under regional anaesthesia had successful spinal anaesthesia for caesarean section at L3/4 following two failed CSE attempts and two failed SSS attempts using 0.5% hyperbaric bupivacaine 2.2 ml + fentanyl 15 mcg + morphine 100 mcg. Block height achieved at 5 min was C4. At 9 min, BP decreased from 125/80 preoperatively to 110/25 while HR stayed at 105/min. After patient was catheterized, she complained of severe nausea when about to retest level followed soon by loss of consciousness and asystole on ECG. As there was no pulse or breathing, cardiopulmonary resuscitation was commenced immediately with 100% oxygen via bag mask. Intravenous atropine 0.6 mg was given with return of spontaneous circulation, sinus rhythm and consciousness after 15 seconds. At 24 min, BP was 110/28. There was no skin rash, urticaria or wheeze seen. At 28 min, surgery commenced. At 29 min, when BP decreased to 55/25 with HR 115/min, intravenous phenylephrine total 300 mcg, ephedrine total 15 mg and gelafundin 500 ml were given. At 34 min, BP was 80/35 and HR 125/min. At 35 min, baby was delivered with Apgar score 8/9. At 39 min, BP was 120/55, HR 125/min and S<sub>p</sub>O<sub>2</sub> 100%. At 48 min, umbilical cord arterial pH was 7.215. At 51 min, umbilical cord venous pH was 7.276. She had an uncomplicated course thereafter. Blood loss was 450 ml and Hartmann's 1.0 L total was given. At 53 min, patient was transferred to the recovery room. Oxygen saturation remained at 100% throughout this period.

In the recovery at 54 min, the block height was T3, BP 120/63, HR 85/min, and she was given O<sub>2</sub> 5 L/min by face mask. At 1h 49min, block height decreased to T11, BP 112/72, HR 82/min. At 1h 54min, she was sent to the ward on face mask oxygen with continuous oxygen saturation monitoring.

## Discussion

Successful resuscitation of sudden unexpected cardiac arrest requires an understanding of the probable causes. The probable cause in this presumably young healthy patient was a high neuraxial block (C4) with a sharp preload reduction due to vasodilatation with relative hypovolaemia, possibly triggering a Bezold-Jarisch cardiac inhibiting reflex (stimulation of inferoposterior left ventricle wall mechanical receptors leads to afferent glossopharyngeal and vagal fibre activation of the brainstem which can stimulate parasympathetic activity and suppression of T<sub>1-4</sub> cardiac-sympathetic supply to the heart) with consequent profound bradycardia and hypotension, and if untreated to cardiac arrest. The high block could have been due to unintended epidural volume extension during the failed CSE attempts. This was contributed by the change in patient positioning producing aortocaval compression in a full-term parturient<sup>1</sup>. Parturients typically have a higher heart rate (as in this case) and should be less likely to develop bradycardia or cardiac arrest. This complication can occur up to an hour after a spinal anaesthetic.

Treatment must be quick, intensive and multi-modal. Thus, 0.6 mg was beneficial in this patient. Intravenous adrenaline 1 mg or intravenous vasopressin 40 U may also be used<sup>2</sup>. Delay in treatment is associated with a worse prognosis. Frequency of cardiac arrest for patients during spinal anaesthesia is about 2.9/10,000 and up to 25% of such cardiac arrests are fatal<sup>3</sup>. Though most vasovagal episodes are self-limited and easily treated, one should be vigilant and aggressive in treating every case. As it is a reflex, it would be difficult to predict or prevent.

## References

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2. Moitra VK, Einav S, Thies KC, et al. Cardiac arrest in the operating room: Resuscitation and management for the anaesthesiologist: Part 1. *Anesth Analg* 2018;126(3):889-903.
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## Learning point

One should always have a ready individualised management plan for a successful outcome.