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Anesthetic Management of a patient with Atrial Premature Complexes undergoing lower segment cesarean section

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Abstract
A 20 year G2P1L1 with previous Lower segment cesarean section (LSCS) scheduled for elective LSCS had history of premature atrial complexes (PACs) with Atrial fibrillation (AF) in previous pregnancy during LSCS. She was given combined spinal epidural anesthesia and managed successfully with stable hemodynamics. Arrythmias in pregnancy are uncommon. Physiological and hormonal changes during pregnancy can precipitate arrythmia. Therefore it is necessary for the anesthesiologist to evaluate risk factors for arrythmia and plan accordingly the mode of anesthesia and anesthetic agents for surgery.

Keywords: *PAC, atrial fibrillation, anesthesia*

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I. Introduction

Premature atrial complexes (PACs) result from an ectopic focus in the atria which discharges before the next sinus impulse. Premature P wave occurs earlier than the sinus P wave and has a different morphology as compared with sinus P wave. P wave is normal in most cases but might be prolonged. PACs are also commonly referred to as atrial premature complexes, premature supraventricular beat and premature atrial beat. Cause of premature heartbeat is unknown and is commonly idiopathic. Arrythmias in pregnancy are uncommon. Pregnancy can precipitate or exacerbate cardiac arrythmias. Hemodynamic and hormonal changes that occur during pregnancy are potential factors that promote arrythmia in pregnancy. Cardiac arrythmias are a significant cause of morbidity and mortality in the perioperative period.[7]

II. Case Report

20 year old female, G2P1L1 with previouslower segment cesarean section (LSCS) with short inter conceptional period was scheduled for elective LSCS. She had history of amenorrhea for 9 months. Patient was diagnosed with atrial fibrillation with atrial premature complexes (APCS) in the previous delivery during LSCS and was started on Tablet Digoxin 0.25 mg once a day and tablet Metoprolol 25 mg twice daily which she took for 13 days and then stopped medication without medical advice. She gave no history of palpitations. Patient was now started on Tablet Metoprolol 25 mg once a day since 3 days. On examination her pulse rate was 92 beats per minute, BP was 90/70 mmHg. On auscultation respiratory system showed bilaterally equal normal vesicular breath sounds with room air saturation of 99%. Blood investigations were within normal limits. Electrocardiogram showed atrial premature complexes. Echocardiography findings of the patient showed EF 50% with mild mitral regurgitation, trivial tricuspid regurgitation and good left ventricular systolic function. The patient was kept nil by mouth the previous night. On the day of surgery, written informed high risk consent was obtained from the patient. In the preoperative room, intravenous line was secured with 20 gauge intracatheter and patient was preloaded with 250ml of Ringer's lactate and was then taken inside the operation theatre. Monitoring included ECG, SpO2 and non invasive blood pressure. Bladder was catheterized to monitor urine output. Anti- arrythmic drugs were kept ready. Patient was premedicated with Injection Ondansetron 4mg by intravenous route. Patient was induced under epidural spinal anesthesia. Epidural catheter was inserted 4cm into epidural space. Inj. Bupivacaine 0.5% (H) 7mg (1.4ml) and Inj. Fentanyl 25mcg was given intrathecally. The sensory level achieved was T8 and was set upto T6 dermatomal level with the epidural dose of 3ml 2% lignocaine and was maintained with the help of intermittent epidural dosages of local anesthetics. Hemodynamics were stable throughout the intraoperative period. The procedure lasted for 1 hour. Postoperatively patient was stable and shifted to intensive care unit for observation. Epidural catheter was kept for 2 days for postoperative analgesia.

III. Discussion

PAC result from an ectopic stimuli arising from the loci in either the left or right atria or interatrial septum but not from the SA node itself. PACs are independent predictors of atrial fibrillation, stroke and death. However, little is known about PAC frequency in general population and its association with cardiovascular risk factors. Frequent PACs are associated with increased risk of atrial fibrillation and subsequent complication.[5] AF is associated with increased risk of mortality and morbidity due to ischaemic stroke, congestive heart failure and cognitive dysfunction.[5]

Catecholamines release associated with emotional and pharmacological stress that may occur in the perioperative and operative period will increase the likelihood of development of premature atrial depolarization.[3] It is essential to evaluate risk factor for arrythmia because it may result in hemodynamic instability. Various factors associated with anesthesia influence occurrence of arrythmia.[3]

For intraoperative arrythmia, beta blockers are preferred over calcium channel blockers due to shorter duration of action and lesser negative ionotropic effect.[2] Treatment includes beta blockers, calcium channel blockers to decrease heart rate and sodium and potassium channel blockers to control heart rhythm. Digitalis glycoside can be used to strengthen heart contraction. Blood thinners are used to prevent blood clots from forming. In hemodynamically compromised patient, direct current cardioversion is the most effective method of converting AF to sinus rhythm[2].

In our case here, combined spinal epidural anesthesia was given that provide hemodynamically stable anesthesia for surgery. We found similar case report where combined spinal epidural anesthesia was given for parturient patient with acute AF for emergency LSCS.[4]

Fentanyl added to intrathecal bupivacaine improve the quality of spinal anesthesia and also provide post operative analgesia for longer duration. In addition, it also decreases the incidence of hypotension associated with spinal anesthesia. The incidence of hypotension following spinal anesthesia is reported to be as high as 94% in uncomplicated pregnancies.[6] No intervention has been able to prevent hypotension completely but its incidence decreases 31% when intrathecal isobaric bupivacaine 5mg and fentanyl 25mcg were used.[6]

Also we preferred regional anesthesia over general anesthesia. Anesthetic agents themselves are arrythmogenic. Tracheal intubation is one of the most common cause of arrythmia during induction as well as during perioperative period, most often associated with hemodynamic disturbance.[2] The drugs used for induction, maintenance as well as for reversal of general anesthesia are not primarily arrythmogenic , but arrythmia can be produced in presence of variety of triggering factors.[2] Increased sympathetic activity, hypoxia, hypercarbia, metabolic acidosis increase the discharge rate of automatic cell above and below AV node, the hypoxic or acidotic cell has an unstable membrane which is more readily depolarized.[3] These factors should therefore be avoided.

IV. Conclusion

We report a case of PAC with AF. Though uncommon, AF can occur with PAC and carries the potential of hemodynamic instability. Intraoperative arrythmia can occur during anesthesia. Precipitating factors therefore should be identified and treated. The understanding of hemodynamic and hormonal changes that occur during pregnancy and electrophysiologic basis of arrythmia is necessary for management of the condition.

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