International Journal of Biomedical and Advance Research
ISSN: 2229-3809 (Online); 2455-0558 (Print)
Journal DOI: https://doi.org/10.7439/ijbar
CODEN: IJBABN
Case Report

Anaesthetic management of a parturient with complete heart block for emergency caesarean section

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Abstract

Management of patient with complete heart block (CHB) presenting for emergency caesarean section warrants preservation of heart rate to maintain haemodynamic stability. Sudden cardiac death and congestive heart failure are known sequelae because of slow heart rate caused by complete heart block. Role of temporary pacing is debatable for labor and delivery in asymptomatic patients. However in absence of pacemaker, Isoprenaline with general anaesthesia can be safely employed when chronotropic response to atropine is observed in these patients.

Keywords: Complete heart block, Isoprenaline, General anaesthesia, Caesarean section.

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***Article History:**
Received: 13/02/2019
Revised: 12/03/2019
Accepted: 17/03/2019
DOI: https://doi.org/10.7439/ijbar.v10i3.5121

How to cite: Tambey, R., Gadpale, B., & Tirpude, N. Anaesthetic management of a parturient with complete heart block for emergency caesarean section. *International Journal of Biomedical and Advance Research* 2019; 10(3): e5121. Doi: 10.7439/ijbar.v10i3.5121 Available from: https://ssjournals.com/index.php/ijbar/article/view/5121

1. Introduction

Obstetric anaesthesiologist can encounter various unforeseen challenges. The patient can be full stomach, anemic, hypovolaemic, can present with uncontrolled hypertension or with associated comorbidity. Usually in emergency, time for investigations and optimization is limiting factor. A parturient with complete heart block (CHB) ideally needs proper preoperative evaluation and stabilization of heart rate before labor or caesarean section.

Complete heart block is a conduction disorder characterized by a random relationship between the atrial and the ventricular activation as atrial impulses are not conducted to the ventricle, which are depolarized in response to a subsidiary pacemaker. It may be congenital or acquired. Acquired variety is rare during pregnancy as it is mostly seen after 50 years of age. [1] However, congenital variety though rare may be encountered during pregnancy.

Whenever encountered in a pregnant woman, it remains a challenge for the obstetrician as well as anaesthetisiologist and requires multidisciplinary approach involving the cardiologist.

Herein, we are reporting 33 years old female with complete heart block without pacemaker, who presented for emergency caesarean section.

2. Case report

A 33 years old female Gravida 2, Para 1,38 weeks pregnancy belonging to lower socioeconomic status with history of previous LSCS 8 years back came to hospital with labor pain, scar tenderness and severe fetal distress.

Patient was an undiagnosed case of complete heart block during previous pregnancy and was operated for LSCS under spinal anaesthesia uneventfully. During 34th weeks of her second pregnancy, patient was diagnosed as a case of complete heart block and started on tablet Isoprenaline 10 mg BD. According to her ANC records, she was maintaining heart rate of 55-60 beats per minute and echocardiography showed no structural abnormality. She was advised to get hospitalized at 36th week of pregnancy. However she directly reported to obstetric OPD with labor pain.

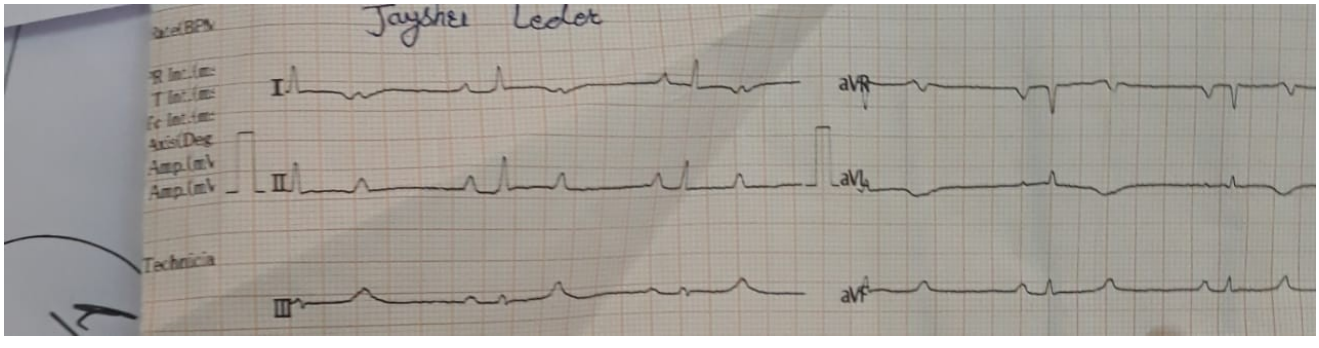
Patient was nil by mouth since last 10 hours but had skipped morning dose of tablet Isoprenaline. She was taken for emergency LSCS. Inside operation theatre monitors were attached, which included ECG, Pulse oximetry and Noninvasive blood pressure. ECG was suggestive of complete heart block with complete AV dissociation with heart rate of 36 beats/minute, (Figure 1). SpO_2 was 98% on air with blood pressure of 138/83 mmHg.

Decision for general anaesthesia was taken and high risk informed consent was obtained.

Patient was premedicated with Inj. Ranitidine 50 mg and Metoclopramide 10 mg iv. After iv Atropine 0.6 mg patient's heart rate increased up to 60-65 beats/min. It was not possible to arrange for temporary pacemaker because of time constrain as well as unavailability of pacemaker. Inj. isoprenaline 400mcg i.v. bolus was given and infusion @2.5 mcg/minute was started. Patient was preoxygenated with 6 L of 100% oxygen for 3 minutes. Patient was induced with Inj. Thiopentone 250 mg i.v. with Inj. Atracurium 25 mg i.v. and intubated with cuffed endotracheal tube 7.0 mm. General Anesthesia was maintained with O_2 + N_2O + desflurane. Intraoperatively heart rate was maintained between 40-50 beats/min.

A single live female baby was delivered. Inj. Methyl ergometrine 0.2mg i.v. was given and Inj. oxytocin 10 unit started in i.v. infusion. Inj. midazolam 1mg i.v., inj. Pentazocine 15 mg i.v., inj. Diclofenac 75 mg i.v. was administered. Patient was stable hemodynamically throughout surgery.Patient's preoperative Hb was 8 gm% and intraoperative blood loss was around 600 ml so patient was given ringer lactate 500ml and 1 whole blood. Incision site was infiltrated with 5 ml 0.5% inj.bupivacaine + 5 ml 2% inj. Lignocaine. Neuromascular block was reversed with inj. Atropine1.2 mg + inj. Neostigmine 2.5 mg iv. Patient was extubated after she was fully awake and had adequate muscle tone. Patient was shifted to PACU for observation. Isoprenaline infusion was continued for 12 hours postoperatively and then shifted to tablet Isoprenaline. After one week patient was referred to cardiologist for further evaluation and management.

Figure 1: Electrocardiogram of case



3. Discussion

Physiological changes in pregnancy include 15-25% increase in heart rate, 40-50% increase in cardiac output and 25-30% increase in stroke volume [2]. Cardiac output during labor increases from pre-labor values by approximately 10% in the early first stage, by 25% in the late first stage, by 40 % in the second stage of labor. Uterine blood flow increases from a baseline value of approximately 50 ml/min to a level at term of 700 to 900ml/min [3].

Permanent pacemakers implanted before pregnancy are occasionally encountered. Pregnancy and labor and delivery are generally well tolerated in these patients. Advanced second-degree (two or more nonconducted P waves) or third-degree atrioventricular block is rare in pregnant women and is most commonly seen in patients with congenital heart disease. Recommendations are inconsistent as to whether temporary pacing is required for labor and delivery. Some of the principal indications for pacemaker placement (e.g., symptomatic bradycardia, periods of asystole greater than 3 seconds, escape rhythms below the atrioventricular node with rates < 40 beats per minute) also appear to be appropriate indications for parturients; the decision to electively place either a temporary or permanent device should be made by a multidisciplinary team. Patients who develop hemodynamic instability due to bradycardia should receive a temporary venous pacemaker. Transcutaneous pacing is an attractive alternative, but it is uncomfortable for prolonged use.

Third degree heart block, also known as complete heart block, is the complete interruption of AV conduction. There is no conduction of cardiac impulses from the atria to ventricles. Continued activity of ventricles is due to impulses from an ectopic pacemaker distal to the site of conduction block. If the conduction block is near the AV node, the heart rate is usually 45 to 55 beats per minute and the QRS complex is narrow. When the conduction block is below the AV node (infranodal), the heart rate is usually 30 to 40 beats per minute and the QRS complex is wide[3]. Congestive heart failure can occur from the decreased cardiac output and bradycardia that accompanies third degree AV block [4].

Complications of complete heart block include severe bradycardia, hypotension, hemodynamic instability, syncope and sudden death due to asystole. The main therapeutic intervention in complete heart block is permanent pacing, particularly in the setting of cardiac enlargement, left ventricular dysfunction and waking heart rate of <40 beats/minute. Adjunctive pharmacologic

treatment with Isoprenaline may take some time to initiate and become effective so temporay pacing may be necessary [5].

The most appropriate anaesthetic technique for caesarean section in women with CHB is yet to be clarified due to rarity of disease. Caesarean section done under both regional and general anaesthesia has been reported in literature [6,7]. Although the risk of hypotension is less with epidural technique; it may not be suitable in emergent situations with time constraints. Due to foetal distress we did not consider epidural anaesthesia in our patient. Caesarean delivery might be safely contemplated without temporary pacing in asymptomatic women with CHB who demonstrated chronotropic responses to atropine [8].

We preferred general anaesthesia in our case over spinal anaesthesia. Under spinal anaesthesia, the level of T6 is required in caesarean section for adequate analgesia and muscle relaxation. This may lead to hypotension which cannot be compensated in case of complete heart block. General anaesthesia is safer if the option of temporary or permanent pacing is not available owing to emergency nature of surgery. Drugs which are known to cause bradycardia and or hypotension were avoided. Inj. Isoprenaline which is also known as pharmacological pacemaker was used throughout the intraoperative and postoperative period.

For an elective surgery in patients with complete heart block, pacemaker should be inserted or kept ready to optimize the heart rate. However isoprenaline with controlled general anaesthesia with set desired goals can be a very useful alternative in emergency situations.

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