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Anaesthetic Management of Ischemic Heart Disease patient for Total Abdominal Hysterectomy under Epidural Anaesthesia and Analgesia

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Abstract

Anaesthetic management of cardiac patient's coming for non cardiac surgery has always been challenging. Goal of anaesthesia management is to keep myocardial oxygen supply greater than demand to avoid ischemia. Choice of anaesthesia has been general anaesthesia (GA) by achieving the goals, in order to prevent ischemia intra and post operatively in cardiac patient coming for non cardiac surgery. In this case report anaesthetic implications included assessment of cardio vascular status of the patient pre operatively with selection of epidural anaesthesia and analgesia technique. Incremental doses of local anaesthetic (LA) were given keeping in mind, myocardial oxygen supply to be greater than demand to avoid ischemia. To the best of our knowledge, there have been only few case reports on epidural anaesthesia for *ischemic heart disease* (IHD) patient coming for non cardiac surgery. Hence we report a successful anaesthetic management of a patient with ischemic heart disease for total abdominal hysterectomy under *epidural anaesthesia and analgesia*.

Key Words: Ischemic Heart Disease, Epidural Anaesthesia (EA), Myocardial Infarction (MI), Lumbar Epidural Anaesthesia (LEA), Thoracic Epidural Anaesthesia (TEA)

Introduction

IHD is number one cause of morbidity and mortality in world [1] and peri operative complication in cardiac patient's. Patients high risk for IHD, require identification of risk factors, pre operative evaluation and optimization, medical therapy, monitoring and appropriate anaesthetic technique and drugs. Risk factors influencing peri operative cardiac morbidity are recent *myocardial infarction* (MI), congestive cardiac failure, peripheral vascular disease, angina pectoris, diabetes mellitus, hypertension, hypercholesterolemia, dysrhythmias, age, renal dysfunction, obesity, life style and smoking.

Choice of anaesthesia has always been general anaesthesia (GA) by achieving the goal to keep myocardial oxygen supply greater than demand, achieved by preventing tachycardia and extremes of blood pressure, [2] otherwise seen during laryngoscopy and intubation which can lead to ischemia. Epidural anaesthesia (EA) can decrease cardiac morbidity and mortality in IHD patients coming for non cardiac surgery. [3] There have been only few case reports on epidural anaesthesia for *ischemic heart disease* (IHD) patient coming for non cardiac surgery. Here we report anaesthetic management of a patient with antero lateral IHD, posted for total abdominal hysterectomy *under epidural anaesthesia and analgesia*.

Case Report

45 year old female, dyspnoea on exertion (NYHA - class 2), known case of IHD and hypertension since 3

years, diagnosed to have fibroid uterus, posted for total abdominal hysterectomy with bilateral salpingo oophorectomy. Patient on Tab. metropolol 25 mg O.D, Tab. losartan 50mg O.D and Tab. ecosprin 75mg O.D. On Examination - Moderately built, weight 63kgs, pulse rate 60/min, B.P = 180/ 90 mmHg. CVS examination and other systemic examination were normal.

Laboratory investigations (routine haematological, liver and kidney function, serum electrolytes, Coagulation) were normal. Chest X-Ray - Cardiomegaly, ECG showed antero lateral wall ischemic changes, ECHO = concentric left ventricular hypertrophy with Ejection Fraction = 60%, Tread Mill Test positive for inducible ischemia and normal coronary vessels on angiography. Cardiologist opinion was obtained. (Class 2 cardiac risk index)

Anaesthetic Management

ASA grade III physical status patient, after pre operative counselling & informed consent obtained, was given Oral Alprazolam 0.25 mg at night. Next day morning Anti hypertensive and beta blocker were continued. Tab. Ecosprin discontinued on the previous day of surgery.

After I.V. access Inj. Ranitidine 50 mg, Inj Ondansetron 4mg, Inj. Midazolam 1 mg and Inj Fentanyl 50 microg were administered. Monitors included pulse oximetry (spo2), Electro cardio gram (ECG), Non Invasive Blood Pressure (NIBP). Pt

was pre loaded with 10ml/kg of Ringer Lactate. Oxygen 60% Fio2 Via Venti mask was given.

Under strict aseptic precaution, in sitting position, skin was infiltrated with 2% plain xylocaine. Using 18 G touhy needle, introduced at L2 – L3 inter vertebral space. Epidural space confirmed by loss of resistance technique. After giving test dose of 3ml 2% xylocaine ,negative aspiration for CSF and blood, 20G Epidural catheter was threaded upto T7 - T8 level and fixed to skin. Total of 8 ml 2% Plain Xylocaine + 14 ml of 0.5% plain Bupivacaine was given via epidural catheter incrementally. Total blockade got from T6 to S5 Level. Duration of surgery was 2 hrs 30mins. Epidural topped with 10 ml of 0.25% Bupivacaine after 1 hr 15 mins of starting bolus dose and once again after 45 mins of first top up dose. Total intra venous fluid, intra op was 1800 ml of crystalloids, urine output of 800ml and estimated Blood loss of 200ml. Intra Operative Systolic Blood pressure maintained between 130 mm Hg to 190 mmHg, Diastolic Blood pressure between 70 – 100 mm of Hg. Heart rate between 40 to 60/ min.

Post-operatively SpO₂, NIBP, ECG with O₂ supplementation by ventimask was done in the recovery room. Inj Buprenorphione 150 mcg was given via epidural after 2 hrs of surgery and then B.D with Inj Diclofenac 75 mg I.M for 2 days post operatively. 3rd post op day epidural was removed and put on Inj Diclofenac 75mg I.M B.D with inj Tramadol 50 mg SOS i.v.

Discussion

Anaesthetic goals for patient with IHD are - Stable hemodynamics, prevent M.I by optimizing myocardial oxygen supply and reducing oxygen demand, monitor for ischemia, treat ischemia or infarction if it develops, normothermia ,avoidance of significant anaemia.

For elective surgery perioperative management depends upon various clinical risk factors and surgery specific risk factors. [4] In this case report, patient has mild angina pectoris and previous MI by history (Intermediate clinical predictor), intermediate risk surgery with cardiac risk of less than 5%. Pre medication with Benzodiazepine and Opioid to allay anxiety, maintain hemodynamic, otherwise can lead to ischemia. All anaesthetic techniques must aim to keep myocardial oxygen supply greater than demand to avoid ischemia. Goal of G.A for IHD is avoiding tachycardia and extremes of blood pressure. [2]

The potential and well known advantage of regional anaesthesia over G.A should be an asset in cardiac patients. Disadvantages of regional anaesthesia include hypotension from uncontrolled sympathetic blockade and need for volume loading can result in ischemia. Larger doses of local anaesthetic (LA) can cause myocardial toxicity and myocardial depression. [5] Hence in this case LA was given in incremental dose slowly by monitoring hemodynamic parameters.

Activation of the sympathetic nervous system may result in myocardial ischemia and infarction. TEA (Thoracic epidural anaesthesia) with L.A with or without GA, offers potential benefits such as improved balance of myocardial oxygen supply – demand and greater intra operative hemodynamic stability. [3] Lumbar Epidural Anaesthesia (LEA) reduces myocardial morbidity for operations on the lower extremity or lower abdomen through a reduction in pain and the surgical stress response but the ability to directly inhibit cardiac sympathetic innervation may confer a physiological advantage

to TEA over LEA. [3] Epidural local anaesthetics or opioids as compared to systemic opioids are better for post operative analgesia, suppressing the stress response to surgery, reduction in M.I and dysrhythmias. [3] Yeager et al and Tuman et al concluded pt's in epidural analgesia group had less incidence of post operative myocardial morbidity compared to G.A group in pt's scheduled for high risk surgery[6]. Stress response may enhance perioperative hypercoagulable state and the release of cytokines and neuroendocrine hormones, leading to vascular thrombosis and cardiac morbidity through reduction in myocardial oxygen supply or increase in demand, which are prevented by Epidural L.A. [7]

Beattie et al in meta analysis on epidural analgesia, concluded that reduction in cardiac events with post operative epidural analgesia is important because many high risk patients cannot tolerate beta – adrenergic blockers, which also reduces post myo cardiac infarction. [8] G.A is associated with hypotension due to I.V induction agents, tachycardia and hypertension due to pressor response during direct laryngoscopy and tracheal intubation, leading to cardiac morbidity [9] which can be prevented. Rivers *et all* compared Epidural anaesthesia Vs General anaesthesia for infrainguinal arterial reconstruction and concluded that both regional and general anaesthesia techniques remain equally acceptable.[10] Hence we conclude that Epidural Anaesthesia can equally be an alternative for General Anaesthesia for anaesthetic management in cardiac patient's coming for non cardiac surgery as they reduce pre load and after load, stress response, coagulation responses, coronary vasodilatation, post op analgesia, less incidence of peri operative and post operative M.I, maintain myocardial oxygen supply and reducing oxygen demand and harmful effects of G.A like hypotension due to I.V induction agents, tachycardia and hypertension due to pressor response during direct laryngoscopy and tracheal intubation.

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