CASE REPORT

Technique of Anaesthesia in Pulmonary Hypertension and Thrombophilia in Early Pregnancy

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Summary

Pulmonary hypertension in pregnancy is a rare condition but is associated with a high mortality. We report the case of a 29 year old female in early pregnancy with Protein C and S deficiency with recurrent deep venous thrombosis and pulmonary embolism and subsequent secondary pulmonary hypertension. The patient was counselled and consented for termination of pregnancy with tubal sterilization. She was administered continuous spinal anaesthesia with invasive monitoring. The successful anaesthetic management of this condition is described.

Key Words: Protein C Deficiency, Continuous Spinal Anaesthesia, Pulmonary Hypertension

Introduction

Pulmonary Hypertension secondary to Protein C and S deficiency is a rare condition in pregnancy and it can result in high mortality. We describe the anaesthetic management of such a patient after counseling for termination of pregnancy and tubal sterilization.

Case Report

The patient was a 29 year old Malay female primigravida (weight 46 kg) with 8 year history of Protein C and S deficiency. In 1997, she developed frequent syncope and decrease effort tolerance and cardiac catheterization revealed pulmonary arterial pressure 101/59 (mean 75) mmHg. The patient was anticoagulated with warfarin and slow release nifedipine 10mg B.D added to reduce pulmonary hypertension. In May 2003, the patient became pregnant and the couple was counselled by a cardiologist regarding high mortality if pregnancy continued. The couple consented to termination of pregnancy at 7 weeks gestation.

Preoperative assessment revealed an asymptomatic patient with signs of pulmonary hypertension (loud P 2 on auscultation). The blood pressure was 96/52 mmHg and heart rate was 60/min. the ECG showed right axis deviation and right ventricular hypertrophy. The plain CXR showed prominent pulmonary artery and borderline cardiomegaly. An echocardiography showed enlarged right heart chamber and pulmonary artery with LV ejection fraction of 80%. Blood investigations showed haemoglobin 15.1g/dL and haematocrit 0.49. Blood urea, electrolytes, creatinine and coagulation profile were within normal limits. The warfarin had been stopped for one week and replaced by fraxiparine 0.4 mg BD subcutaneous injection. The patient was counselled for continuous spinal anaesthesia (CSA) with invasive monitoring and post operative intensive unit care (ICU) admission.

On the day of surgery, the morning dose of fraxiparine was omitted. An 18G cannula was inserted into the peripheral vein and compound sodium lactate solution was infused. The left radial artery was cannulated under local anaesthetic for invasive blood pressure monitoring. The right internal jugular vein was

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cannulated and a triple lumen catheter was inserted under aseptic technique for central venous pressure (CVP) monitoring. Other monitors included ECG and Pulse Oximeter. Under aseptic technique, a 22G microcatheter was inserted into subarachnoid space at Lumbar 4/5 level. 0.5% heavy bupivacaine was then slowly injected and haemodynamic parameters were recorded (see Table I). Intravenous boluses of phenylephrine 0.02 mg were given as rescue vasoconstrictor when indicated. Once the level of sensory block was above T10 dermatome, the patient was placed in lithotomy position and evacuation of uterus was performed. The patient was then placed supine, cleaned and drapped and a mini-laporotomy bilateral tubal sterilization was performed. The patient was comfortable during surgery and estimated blood loss was about 100m. A total 1000ml. compound sodium lactate was given. Postoperatively the patient was monitor in ICU for one week. The management included oxygen therapy and subcutaneous injection of fraxiparine 0.4mg BD starting 2 hour after CSA catheter removal. Subcutaneous injection of morphine 5mg 6 hourly was given as postoperative analgesia. The patient was discharged 12 days after surgery with oral warfarin 5mg daily and nidedipine SR 10mg BD for follow-up followed up at the gynaecology and medical clinic.

Discussion

Patients with pulmonary hypertension tolerate cardiovascular changes associated with pregnancy poorly and often resulted in acute right ventricular failure and possibly death. Many authors have regarded pulmonary hypertension as a lethal combination, with mortality ranged from 50-70% and even higher if the patients underwent caesarean section[1,2,3]. As anaesthetist caring for this group of high risk patients, our aim was to maintain right ventricular function and avoid sudden haemodynamic changes that may lead to decompensation. At the same time adequate anaesthesia and analgesia were to be provided. Regional anaesthesia is generally agreed to be the best option, especially slowly titrating epidural anaesthesia under invasive monitoring[2,5]. Others have reported the use of general anaesthesia for patients with severe pulmonary hypertension presenting for emergency caesarean section [3,4]. In recent years, continuous spinal anaesthesia (CSA) has emerged as an alternative regional technique to epidural anaesthesia. CSA offers several advantages over epidural anaesthesia. Firstly is the clear end point of CSA: the return of cerebro-spinal fluid (CSF). In epidural anaesthesia, the end point of "loss-of resistant" is not as distinct and there is always a possibility of inadvertent dural puncture and the catastrophic consequence when bupivacaine is administered. Secondly, with small amounts of local anaesthetics slowly titrating, it offers gradual block onset and hence is haemodynamically stable. Our patient needed 8.75mg heavy bupivacaine for a 35 minutes procedure and haemodynamic parameters are stable. The side effects associated with general anaesthesia such as haemodynamic response to intravenous induction agent, laryngoscopy and intubation are avoided with the use of CSA.

Table I: Haemodynamic Events During Surgery

Time	Remark	BP (mmHg)	HR (b/min)	CVP (mmHg)	SpO2 (%)	Level of Block
0995	Preinduction	121/67	57	11	98	
1113	25mcg fentanyl +1.25mg heavy Bupivacaine	122/75	66	13	95	
1123	+1.25mg heavy Bupivacaine	118/71	57	13	97	L4
1133	+1.25mg heavy Bupivacaine	110/64	55	12	97	
1143	+1.25mg heavy Bupivacaine	113/66	57	10	97	L3
1153	+1.25mg heavy Bupivacaine	110/64	61	9	95	
1203	+1.25mg heavy Bupivacaine	108/63	56	9	96	T10
1210	+1.25mg heavy Bupivacaine	109/68	61	9	96	T10
1220	TOP done	111/68	61	9	96	
1230	Start tubal sterilization	110/67	60	9	96	T10
1240		104/60	48	9	98	
1300	CSA catheter removed					

However, CSA are not without complications. Post-dural puncture headache after CSA is reported to be as high as 30%. Other complications included lower back pain, neurological complication such as persistant parasthesia and risk of infection [5].

Since the patient is anti coagulated because of thrombophilia, warfarin was converted to subcutaneous fraxiparine injection one week prior to surgery and fraxiparine dose on the morning of surgery omitted. Postoperatively, the resumption of fraxiparine only occur after the return of sensation from CSA with no evidence of lower limps neurological deficit.

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