

Spinal Anesthesia: A Noble Choice for Emergency Caesarean Section in a Morbidly Obese Parturient with Preeclampsia

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Abstract: Obesity is associated with an increased risk of maternal morbidity and mortality. Morbid obesity associated with preeclampsia in a pregnancy is a great challenge to anaesthetist when patient requires caesarean section. Providing anesthesia for these patients presents unique challenges that can best be met through an understanding of the pathophysiologic changes associated with obesity and preeclampsia and with use of techniques that maximize benefits while reducing the risks of complications.

Keywords: Morbid obesity, Preeclampsia, Caesarean section, Spinal anaesthesia

INTRODUCTION

A pregnant woman is generally considered obese when her body mass index (BMI) is 30 kg/m² or greater, and morbidly obese when her BMI equals or exceeds 40 kg/m² [1]. Overweight and obese women are at increased risk of several pregnancy related complications, including higher incidence of hypertension, coronary artery disease, cerebrovascular disease, gallstones, gestational diabetes mellitus, preeclampsia, eclampsia, cesarean delivery, and postpartum weight retention [2,3]. Robinson, et al. found that obese women had a higher likelihood of developing antepartum complications compared to women of normal weight [4]. In addition, there is potential intrapartum, intraoperative, and postoperative complications and difficulties related to anaesthetic management. Similarly, fetuses of these women are at increased risk of prematurity, still birth, macrosomia, congenital anomalies, possible birth injury, and childhood obesity [5, 6].

CASE REPORT

A 29 year old lady, G₂P₁₊₀ presented at 36 weeks of gestation for an emergency caesarean section for foetal distress. She developed preeclampsia at 28 weeks of gestation for which she was put on tab. Labetalol (100 mg thrice daily) and α -methyl dopa (500 mg thrice daily). At the time of Caesarean section, her weight was 115 kg & height was 159 cm (so her BMI was 45.5 kg/m²). The patient had history of pregnancy

induced hypertension 6 years ago also and had undergone LSCS (lower segment caesarean section) under spinal anaesthesia with uneventful recovery (at that time she weighed 85 kg). Patient gradually put on weight over 6 years. It was thought to be mainly dietary in origin as there was no history & clinical findings suggestive of Diabetes mellitus, Cushing's syndrome, polycystic ovarian disease, hypothyroidism etc.

Patient was not fasting at the time of caesarean; she had a glass of milk 1 hour before. Pre-anaesthetic airway assessment revealed Mallampati grade III, short neck, limited flexion & extension of neck, thyromental distance of 5 cm, predicting a difficult airway. Her BP was 170/110 and pulse rate was 90 beats per minute (b.p.m.). Peripheral edema was present. Cardiovascular, respiratory, CNS and GI systems were normal on clinical examination. The routine haematological investigations, blood biochemistry, liver function tests, coagulation profile, thyroid function tests and ECG were within normal limits. Her urine examination revealed >5g of protein/24 hour. A diagnosis of ASA grade III with severe preeclampsia in morbidly obese obstetric patient was made.

The patient was counselled for surgery & anaesthetic procedure was explained to the patient in her own language and high risk written informed

consent was obtained. Spinal anaesthesia was planned because patient was not fasting and anticipated difficult intubation was present. However, drugs for general anaesthesia, difficult airway cart, suction machines etc. were kept ready. In the OT, standard monitoring devices like ECG leads, NIBP and SPO2 were attached. Pre operatively her pulse rate was 102 b.p.m., BP 168/106 mm Hg, and SPO2 98% on room air. An intravenous line was secured with 18 gauge cannula. Inj Ringer lactate was started. Intravenous Ranitidine 50 mg and metoclopramide 10 mg were given for aspiration prophylaxis. Patient was catheterized under all aseptic precaution. Patient was put in sitting position. Patient's back was edematous and she was quite obese so it was very difficult to identify midline. Measuring tape and Verbal communication with the patient was used, to identify the midline. After proper painting and draping Subarachnoid block was given in L4-L5 inter space in a single attempt but with difficulty as the 9 cm long needle was just adequate to reach the subarachnoid space 1.6 ml (8 mg) of 0.5% hyperbaric bupivacaine was given intrathecally. The height of sensory block was achieved up to T4 level. Intra operatively Oxygen was given to the patient by facemask. After spinal anaesthesia her BP remained in the range of 140-150 mm of Hg systolic and 90-95 mm of Hg diastolic. A male baby was delivered with birth weight of 3.04 kg, and Apgar score [5, 7]. Inj Oxytocin 5U and inj midazolam 2mg given i.v. slowly. After delivery of fetus her BP shoot up to 180/104 mm of Hg with pulse rate of 90/min. For control of BP inj Labetalol 20 mg IV given, her BP came down to 170/100 mm of Hg. After 5 minutes inj Labetalol 20 mg repeated after this injection her BP came down to 142/94 mm of Hg and pulse rate was 80/min. There after throughout the surgery her vitals remains stable. Total 1200 ml of fluid was given and her urine output was 200ml. Surgery lasted for 30 min. At the end of surgery, her pulse rate was 86 bpm, BP was 140/90 mm Hg and SpO2 on room air was 98%. Patient was shifted to the postoperative ward. She spent 6 days in hospital after operation without any complication.



Fig. 1: Patient undergoing anaesthesia

DISCUSSION

Obesity and preeclampsia can seriously endanger the life of both mother and fetus. Morbid obesity accentuates the physiological changes associated with pregnancy like supine hypotension syndrome, increased severity of gastric reflux, difficult airway, deep vein thrombosis and the high incidence of concurrent medical problems or superimposed antenatal diseases including preeclampsia and gestational diabetes.

Obesity is a serious health epidemic. About 30 million Indians are obese. An obese patient poses a challenge to the anaesthetist as it carries a high morbidity and mortality. In obese parturient, abdominal weight restricts the movement of diaphragm and reduces chest wall compliance promotes airway closure in the dependent portion of the lung [7]. In these patient increase O₂ consumption, decreased functional residual capacity (FRC), increased CC (closing capacity) to FRC and increased ventilation perfusion mismatch all increase the incidence of hypoxia.

A clear relationship exists between obesity and death from cardiovascular causes. Drenick *et al.* [8] demonstrated a 12-fold higher mortality among obese patients between the ages of 25 and 34 than in nonobese patients in the same age range; due to cardiovascular disease Tsueda *et al.* described two obese patients who experienced acute cardiovascular collapse after assuming the supine position [9].

Obese patients have a reduced cerebrospinal fluid (CSF) volume [10] which increases the risk of a high spinal block [11]. In our patient spinal anaesthesia was given with 1.6 ml of hyperbaric bupivacaine although it was technically difficult because of patient's subcutaneous fat and edema. The benefits of spinal anaesthesia include rapid onset of reliable, high quality surgical anaesthesia and avoidance of complication related to emergency general anaesthesia, in addition of the fact that the mother remains awake and can protect her airway, airway manipulation is not required and the incidence of acid aspiration is decreased. Hence, we chose regional anaesthesia.

Although regional anaesthesia remains the most common technique for caesarean delivery section; however, there may be technique failure in a morbidly obese patient. Navarro-Vargas *et al.* reported a case of morbidly obese patient scheduled for caesarean delivery and tubal ligation [12]. These authors used general anaesthesia as the spinal and epidural techniques were unsuccessful.

Epidural anaesthesia offers several advantages but the reason for choosing spinal anaesthesia or

Subarachnoid block in this patient was concern about obtaining an inadequate sensory block with the epidural anaesthesia. Generally, a T4–S5 sensory block is needed for caesarean section. Because of the difficulty associated with blocking sacral nerve roots, epidural block may be inadequate in upto 25% of patients [13]. Also, there is an increased risk of intravenous placement of catheter because of engorged epidural veins and decrease in epidural space.

Pre-eclampsia is a disorder that occurs in pregnancy after 20 weeks of gestation which manifests as hypertension and proteinuria, may progress to eclampsia and may regress following delivery. Obesity is a primary risk factor for preeclampsia, and risk escalates with increasing body mass index [14]. Women with Multiple gestation and history of preeclampsia in a previous pregnancy are at increased risk for preeclampsia in a subsequent pregnancy [15]. This patient was multiparous with singleton pregnancy and there is history of pre-eclampsia in her previous pregnancy.

There are a number of potential problems relating to pre-eclampsia like cerebrovascular accident, renal failure, pulmonary edema, placental abruption, HELLP syndrome etc. In the 2003-2005 CEMACH report, the leading cause of death in women with preeclampsia was intracranial hemorrhage [16]. Generalized edema can involve the airway and obscure visualization of anatomic landmarks at laryngoscopy. Either of the two techniques – general anesthesia (GA) or central neuraxial blockade (CNB) may be employed for anesthesia. GA is often considered unsafe in patients with PIH, because of potentially difficult airway or risk of failed intubation, hypertensive response to laryngoscopy and intubation, risk of aspiration pneumonia, drug interactions between magnesium and nondepolarizing muscle relaxants (NDMRs) leading to enhanced sensitivity to NDMRs, and impaired villous blood supply. So, we opted for regional anaesthesia in this patient.

Thromboembolism and pulmonary complications are the greatest postoperative risk. Early mobilization and incentive spirometry are key in preventing postoperative complications with consideration of hypoxia, positioning, fluid intake output, chest physiotherapy, and analgesia.

CONCLUSION

Morbid obesity along with Pre-eclampsia is a great challenge to anaesthetic as well as obstetric practice. There is problem of establishing regional blocks because of difficulties in identifying landmarks. Longer needles are required, which are not readily available in developing countries like India. In spite of

that, Regional anaesthesia specially spinal anaesthesia whenever possible is a noble choice in these kind of patients though the choice of anaesthesia should be determined by comparing the risks and benefits for an individual patient and the choice of the anaesthetist.

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