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Case Report

Anaesthetic management of a case of severe preeclampsia with hemiplegia undergoing emergency caesarean section: A case report

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ABSTRACT

Cerebrovascular accident in pregnancy may occur as a complication of hypertensive disorders of pregnancy & urgent non-contrast computed tomography brain is required to rule out intracerebral haemorrhage along with other investigations to find the underlying aetiology. Management of cerebrovascular accident during pregnancy may be conservative, neurosurgical or thrombolysis. However, if associated with raised intracranial pressure, priority should be given to airway protection, ventilation, reduction of intracranial pressure & neuroprotection along with the definitive treatment. We report herein a case of cerebrovascular accident who presented at term pregnancy with hemiplegia with impending eclampsia & foetal distress with deteriorating Glasgow Coma Scale requiring urgent stabilisation & emergency caesarean section prior to any brain imaging to establish the cause rendering the anaesthetic management challenging.

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1. Introduction

Hypertensive disorders of pregnancy is one of the leading causes of maternal mortality & morbidity in both developed & developing countries. Fatal neurological complications include eclampsia, intracranial haemorrhage, cavernous venous thrombosis, ischaemic stroke etc.¹ Timely diagnosis & optimisation of blood pressure is the key to prevention of both foetal & maternal complications. Management of neurological complications require proper diagnosis using brain imaging like non-contrast computed tomography (NCCT), magnetic resonance imaging (MRI) or magnetic resonance angiography (MRA) & treatment based on the underlying cause. Though management is mostly conservative, there is no contraindication for neurosurgical intervention for intracranial haemorrhage or thrombolysis for cerebral infarct during pregnancy if indicated. However, the risk of obstetric haemorrhage

should be considered while doing thrombolysis especially in patients at high likelihood of going into labour or requiring caesarean section. For large artery thrombosis in pregnancy, mechanical thrombectomy is a better choice than intravenous thrombolysis.²

We report herein a case of cerebrovascular accident (CVA) who presented at term pregnancy with hemiplegia with impending eclampsia & foetal distress with deteriorating Glasgow Coma Scale (GCS) requiring urgent stabilisation & emergency caesarean section prior to any brain imaging to establish the cause rendering the anaesthetic management challenging. The primary focus was on immediate stabilization, strict hemodynamic monitoring & neuro protection.

2. Case History

A 31-year-old G₄P₃L₃ presented at term pregnancy to emergency department with left sided weakness for 1 week, headache for 10 hours & altered mentation for 4 hours.

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There was no history of fever, neck rigidity, vomiting, loss of consciousness or traumatic head injury. She had no antenatal check-ups during this pregnancy. She was referred from another hospital where she received injection labetalol and induction of labour with tablet misoprostol in view of severe pre-eclampsia.

On examination her blood pressure was 164/100 mmHg, pulse rate 110/min, GCS: 12/15 (E4V3M5), oxygen saturation in room air 88-92%, respiratory rate 40 /min, presence of pedal edema, bilateral crepitations on chest auscultation, motor power of 0/5 in left upper limb & 3/5 in left lower limb with normal power in both the limbs on right side & an extensor plantar reflex on the left side. Per abdomen examination revealed term size uterus with presence of uterine contractions & foetal heart rate of 126/min. On per vaginal examination os was 2 cm dilated, cervix 30% effaced, membranes present, station -3 & adequate pelvis.

Investigations on admission revealed the following: haemoglobin 9.2gm%, total leucocyte count: 8700/mm³, platelet count: 300000/mm³, aPTT: 30 seconds, INR: 0.9, serum urea: 12 mg%, serum creatinine: 0.6 mg%, serum albumin: 2.7 gm%, liver function test & serum electrolytes within normal range. ECG & bedside screening 2D echocardiography findings were unremarkable. Urine albumin was 2+ in dipstick.

Immediately neurology consultation was taken, a provisional diagnosis of cerebrovascular accident was made & planned for emergency NCCT brain. In the meantime, patient's clinical condition started deteriorating, GCS became 10/15 along with foetal bradycardia & required immediate resuscitation along with emergency LSCS in view of impending eclampsia & foetal distress. She was thus immediately shifted to operation theatre & brain imaging therefore deferred.

In the operation theatre resuscitation started targeting airway protection, improving ventilation & oxygenation, optimising blood pressure & reducing intracranial pressure. Rapid sequence induction was done using intravenous injections of propofol 120 mg & rocuronium 80 mg. To reduce laryngoscopic response injection fentanyl 100 µg was administered intravenously before induction. Intubation was done with 7mm cuffed endotracheal tube. Anaesthesia was maintained using oxygen and sevoflurane keeping minimum alveolar concentration below one. A 2.5 kg baby was delivered within 5 minutes by lower segment caesarean section, liquor was found to be meconium stained but the baby was otherwise normal & did not require resuscitation. Besides the use of standard monitors like SpO₂, ECG & capnography, strict monitoring of temperature, blood glucose & arterial blood gas was done. Arterial cannula was inserted in left radial artery & central venous catheter in right internal jugular vein. Blood pressure was maintained with intermittent use of

injection labetalol & fluctuated between 164/108 mmHg & 146/77 mmHg. Normal saline 0.9% was used judiciously monitoring the central venous pressure & maintaining adequate urine output. Intraoperatively infusion mannitol (20%) 100 ml & injection levetiracetam 500 mg was administered intravenously. The whole procedure was completed within 22 minutes. Immediate post-operative NCCT brain of the intubated patient showed small hypodensities in right gangliocapsular region with some amount of cerebral edema. Carotid doppler & deep vein thrombosis screening were normal. Patient was kept in ICU intubated & mechanically ventilated. She was extubated approximately 15 hours later when she became conscious (GCS: E₄V₇M₆), breathing spontaneously & adequately through the circuit with return of all protective airway reflexes. Following extubation, patient continued to require oxygen via nasal prong @ 2litre/min to maintain saturation above 92% for next 24 hours. Chest x-ray showed infiltrations in right basal area probably due to aspiration. Motor power on the left side showed gradual improvement. Conservative treatment continued with tablet aspirin 150 mg once daily, tablet levetiracetam 500 mg twice daily, tablet citicholine 400 mg twice daily & injection enoxaparin 40 mg subcutaneously once daily along with other supportive drugs. Blood pressure was stable without any antihypertensive & other investigations were unremarkable after 48 hours. Thromboembolic deterrent stockings were applied. Limb & chest physiotherapy continued along with breathing exercise. Patient was discharged after 2 weeks with an improved motor power of 4/5 in both the limbs of the left side. Baby was healthy at discharge.

3. Discussion

Ischemic stroke is less common than intracerebral hemorrhage in patients with pre-eclampsia. The mechanism behind stroke in preeclampsia is not completely understood, but could be the result of endothelial dysfunction and loss of cerebral autoregulation similar to eclampsia. Posterior reversible encephalopathy syndrome (PRES) may explain the cause of ischemic stroke in preeclampsia which is a combination of neurological and radiological finding and occurs in response to various acute hypertensive states. It is characterized by vasogenic edema mainly of parieto-occipital lobe due to hyperperfusion secondary to loss of cerebral autoregulation. Cerebral vasoconstriction in response may subsequently lead to the development of infarct.^{3,4} Control of blood pressure in pre-eclampsia is necessary not only to prevent neurological complications but also other maternal & foetal complications. However when infarct develops acutely in order to protect the viable penumbra it is reasonable to treat blood pressure if it is more than or equal to 220/120mmHg or if thrombolysis is warranted where blood pressure has to be maintained below 180/105 mm Hg.

As our patient was intubated during resuscitation for airway protection, proper ventilation, toileting & maintaining normocapnia, general anaesthesia could be administered quickly. Moreover, raised intracranial pressure & altered mentation is an absolute contraindication for giving neuraxial block. Grammatis et al. reported a case of left hemiplegia due to ischemic stroke in preeclampsia patient but there they did CT scan brain prior to caesarean section to rule out intracerebral hemorrhage as the patient had GCS of 14/15 without foetal distress.⁵

In our hemiplegic patient with features of increasing intracranial pressure without prior knowledge of the type of CVA, anaesthetic management was focussed primarily on immediate protection of airway, improving oxygenation & protective ventilation to prevent further lung injury as the patient was full stomach & had aspirated. Also, the aim was to prevent further neuronal damage by reducing the increased intra-cranial pressure & to prevent hemodynamic fluctuation in response to laryngoscopic & surgical stimuli. It was necessary to start the surgery at the earliest for best foetal outcome. As NCCT brain could not be done preoperatively, the possibility of haemorrhagic stroke could not be ruled out. So, systolic blood pressure (SBP) was targeted around 140 mmHg, as there is no additional advantage of aggressive reduction of SBP below 140 mmHg even in a case of haemorrhagic stroke.

Intraoperative maintenance of fluid balance using central venous pressure & pulse pressure variation monitoring is preferable & 0.9% normal saline is usually the fluid of choice. Strict sugar monitoring to keep blood sugar below 180 mg% is desirable. Several studies have shown no added benefit of tight sugar control in terms of functional outcome, death rate or final neurological deficit rather it increases chance of hypoglycaemia.⁶ Hyperthermia & shivering should be prevented as they increase the cerebral oxygen consumption rate. Intraoperative normocapnia should be maintained using proper ventilation strategy. Acid base along with electrolyte balance has to be maintained for best neurological outcomes. All measures to decrease intracranial pressure including mannitol, 3% normal saline etc. should be used intraoperatively as appropriate.

A proper coordination amongst obstetrician, anaesthesiologist & neurologist is the cornerstone in the successful management of such challenging cases.

Priority should be given to stabilisation & if needed caesarean section by an expert obstetrician should be considered which may prove lifesaving.

4. Source of Funding

None.

5. Conflict of Interest

The authors declare that there is no conflict of interest.

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