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TAKAYASU'S ARTERITIS: ANAESTHETIC IMPLICATIONS AND MANAGEMENT OF A PATIENT FOR CESAREAN SECTION IN A TERTIARY CARE HOSPITAL

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ABSTRACT Takayasu's arteritis (TA) is a rare, chronic, inflammatory, progressive, idiopathic arteriopathy, afflicting young women of reproductive age group, causing narrowing, occlusion, and aneurysms of systemic and pulmonary arteries, especially the aorta and its branches. During pregnancy, such patients warrant special attention. We report here with anesthetic management of a primigravida of 37 week gestation, who suffered from TA scheduled for elective cesarean section by general anaesthesia. The intraoperative period was uneventful. The patient was stable in the postoperative period and was shifted to ward after being monitored in the intensive care unit for 24 h.

KEYWORDS : Takayasu's arteritis, parturient, high risk pregnancy, general anaesthesia, epidural anaesthesia.

INTRODUCTION:

Takayasu Arteritis also called as Pulseless disease, Aortoarteritis, Young female's arteritis. It is a rare chronic inflammatory progressive Large Vessel Vasculitis , typically affects women of child bearing age. Male to female ratio is 1:18. Incidence is 13 cases/million. Predominantly seen in women of Asian origin. Etiology remains idiopathic. Autoimmunity, sex hormones and genetic factors have often considered as plausible causative factors. It affects the aorta and its branches, leading to stenosis, thrombosis and formation of aneurysms. We report the anaesthetic management of parturient having takayasu's arteritis scheduled for elective caesarean section.

Case Report:

A 23 year old primigravida, homemaker, with gestational age of 37 week 4 days , came to OPD for safe confinement. She was a known case of Hypothyroidism in 2nd month of pregnancy and was started on T. Thyroxine 25 mcg OD. In 2nd trimester there was history of epigastric pain and claudication in bilateral lower limbs. There was no history of any neurological complications. Her BP was raised to 150/100 mmHg in left upper limb. She was started on T.Nicardipine 10mg QID. On examination her BMI was 24.5. Right radial pulse was 88/min,regular, normovolumic. Left radial pulse rate was 80/min, regular, feeble. Femoral pulse was 78/min, regular, feeble. Radio-radial delay and Radio-femoral delay was present. Blood pressure was variable in all four limbs.

There was a gradient of about 30mmHg between upper and lower limbs. Left subclavian bruit was present. Airway examination was normal. On obstetric examination, fundal height correspond to 36 weeks. Fundal grip s/o Breech presentation. 1st pelvic grip s/o Cephalic presentation. Foetal heart rate was 143/min.

Routine blood investigations were within normal limits. ESR was raised to 45mm/hr. Echocardiography revealed Ejection fraction of 60%. No AR/AS, No MR/TR, No RWMA, good LV systolic function. No coarctation of aorta. USG renal doppler showed bilateral renal arteries within normal limit. Incidental finding of severe stenosis of Abdominal segment of Aorta with involvement of left subclavian artery, coeliac trunk and Superior mesentric artery. Doppler findings were confirmed on Magnetic Resonance Angiography. Diagnosis of Takayasu Arteritis was made. Started on T. Prednisone 5mg OD on Rhematology opinion.

One day prior Cardiac evaluation was done. Asymptomatic status confimed, cleared for LSCS. Transthoracic echocardiography was unremarkable. Ejection fraction of 60%.

Procedure explained to patient and relatives. Written informed high risk consent was taken. ICCU kept standby . Morning dose of T.Thyroxine, T.Nicardia , T. Prednisone was administered. Anti-aspiration prophylaxis- Inj Ondensetron, Inj Metoclopramide, Inj Pantoprazole was given. Patient taken on table. Standard ASA monitors-pulseoximetre, ECG , NIBP cuff was attatched on Right arm(148/94mmHg) and on right calf(114/72mmHg). Position- Head up, left Uterine displacement, pillow kept under neck to prevent neck extension, which may reduce the carotid blood flow by stretching the arteries). Pre-induction Inj. Hydrocortisone 100mg iv was given. Rapid Sequence Induction was done with Inj.Etomidate, Inj.Scoline, Inj.Atracurium. Intubated in single attempt by senior Anaesthetist with Videolaryngoscope. Maintained on O2+N2O+ Sevoflourane on Vol AC mode. BP maintained within 20% of baseline value. 1 episode of hypotension was present which was treated with bolus dose of 60mcg of Inj. Phenylephrine. Within 4 mins Baby boy born of 2.4kg , 5 min APGAR was 9/10. Post delivery of baby Inj. Oxytocin infusion started slowly without affecting arterial pressure. Titrated dose of Inj.Fentanyl 50+25+25 mcg IV. Blood loss was 300ml with Placenta. Surgery duration was 1hr 40 mins. Post Operative Analgesia was given with Inj.Paracetamol along with skin infiltration. Neuromuscular blockade was reversed. 10 mins prior to extubation, Inj Loxicard administered to prevent stress response. Close PACU monitoring was done. Post operative course was unremarkable. Discharged on POD 3.

DISCUSSION:

Takayasu's disease was first described in 1908 by two Japanese ophthalmologists, Takayasu and Onishi, who observed retinopathy occurring with absent limb pulses. The disease is recognized as a rare (2–3/million)[1] granulo matous vasculitis of aorta and major vessels. Takayasu's disease appears to be more common in persons of Asian ethnic origin although it has a worldwide occurrence.[2] Its incidence in the Indian population is not known. It is more common in women than men (8:1), with the peak incidence in the second and third decades, although a substantial minority, including this patient, may present in their teens. The exact etiology remains unknown, but it may have an autoimmune basis. As it is more prevalent in women of childbearing age, sex hormones may be involved in the pathogenesis.[3]

Conditions to consider in the differential diagnosis of TA

include aortic coarctation, atherosclerosis, giant cell arteritis, Wegener granulomatosis, Kawasaki disease, and thromboangiitis obliterans. Involvement of large vessels in our case excludes granulomatosis with polyangiitis and Behcet's disease. Another cause of large vessel vasculitis is giant cell arteritis, which was one of the primary differential diagnoses in our case. But younger age, lower values of raised ESR, absence of any new onset headache, visual symptoms, and jaw claudication symptoms favored the diagnosis of TA . Fibromuscular dysplasia was ruled out by the presence of raised ESR in our patient . IgG4 related vasculitis was eliminated by the absence of lymphadenopathy, normal upper abdomen scan.

The new angiographic classification of TA includes the following (Takayasu conference, 1994)[4]:

- Type I – Involves the aortic arch and its major branches
- Type IIa – Involves the ascending aorta and aortic arch and its branches
- Type IIb – Involves the ascending aorta, aortic arch and its branches, and descending thoracic aorta
- Type III – Involves thoracic descending aorta, abdominal aorta, and/or renal arteries
- Type IV – Involves abdominal aorta and/or renal arteries
- Type V – Combined features of Types IIB and IV

These individuals may be seen by anesthesiologists during incidental surgery, obstetrical anaesthesia, or corrective vascular procedures. Clinically, the patient may present with the absence of various pulses in the upper half of the body.In TA patients, anaesthesia can be accompanied by severe, uncontrolled hypertension that can result in end-organ failure and significant blood artery stenosis that impairs regional circulation.

During the preoperative visit, patients should be evaluated for clinical features of carotid involvement, such as dizziness and syncope on head extension, and should be checked for carotid bruit. During general anesthesia, it is always better to keep the head in neutral position avoiding hyperextension of the head during laryngoscopy as it can lead to postoperative visual disturbances, vertigo, hemiparesis, and seizures. These patients usually have a lower BP recording in the upper limb as compared with the lower limb, and hence, it is advisable to record BP from both the upper and lower limbs during preoperative visit and also during intraoperative period.

Given that they typically get long-term steroid replacement and may have cushingoid characteristics prior to surgery, perioperative steroid treatment is necessary to prevent the development of addisonian hypotensive crises.

For patients in Groups I and IIa, vaginal delivery typically under epidural anaesthesia is acceptable, though instrumental delivery, especially in hypertensive patients, can shorten the second stage of labour.[5] For patients in Stage IIb or III, surgical delivery is preferred, but it should only be used for certain obstetric indications in less severely affected people. Its purpose is to prevent the rise in blood pressure and volume that occurs during uterine contractions.

Choice of anaesthesia technique should be tailored to the presentation of patients. The use of both regional and general anaesthesia has been successful in these cases, according to the literature review. A patient who is awake and able to communicate serves as the best clinical neurological monitor, making regional anaesthesia safe. Yet, the regional circulation may be harmed by the accompanying hypotension brought on by sympathetic obstruction. Gradual blocking during epidural anaesthesia prevents sharp drops in blood pressure and minimises the thrombosis rate. Provide good pain relief after surgery, reducing risk of further increase in arterial pressure. Miekle and Milne[6] suggested caution in the use of epidural anaesthesia where there is a significant difference between arterial pressure in the upper and lower limbs. They contended that sympathetic block caused by the epidural may worsen already limited regional blood flow in an unpredictable 'steal' type manner. General anaesthesia prevents sympathetic blocking, although sophisticated monitoring of cerebral function is required because it may be linked to hypertensive crises and consequent cerebral and cardiac events. Endotracheal intubation, extubation and inadequate depth may result in considerable fluctuations in blood pressure and may precipitate cerebral hemorrhage, rupture of aneurysms and cardiac functions in TA. Our patient had gradient of more than 30mmHg between upper and lower limb, also there was no evidence of cerebral arteries involvement, we decided to proceed with general anaesthesia. It is best to prevent cardiac decompensation in susceptible individuals because it is more likely to occur in conjunction with the increased cardiac output that is typically seen during pregnancy and labour.

Blood pressure monitoring can be challenging in patients with pulseless peripheral arteries. If there is a large difference in blood pressure in upper and lower limbs, one must encourage recording it in both limbs. To evaluate limb perfusion a good alternative is to assess blood pressure in one limb and oximetry in the other; the same was done in the our case.In our case invasive monitoring was deemed unnecessary taking into account the patients BP were controlled preoperatively. Literature has showed a moderate degree of correlation is present between the central blood pressures and those obtained peripherally in the lower extremities by oscillometer or Doppler method. Therefore we used noninvasive automated blood pressure monitoring based on oscillometery principle.

The MAP in these patients should be maintained within 20% of the preoperative values. We preloaded the patient with 20ml/kg of Ringer's lactate as these patients may not acute hypotension. This is because diffuse arteritis result in stenotic and non-compliant vessels, which interfere with compensatory mechanisms to increase blood pressure.

CONCLUSION:

In summary, this primigravida patient was young with less severity of Takayasu's disease, a successful and uncomplicated Caesarean section under general anaesthesia could be carried out. . An interdisciplinary collaboration of obstetricians, cardiologists, and neurologists is necessary to improve maternal and fetal prognosis. Periconceptional counselling is ideal in women with TA. Good outcome can be achieved because of close antenatal surveillance and multidisciplinary care of such pregnancies. Foetal surveillance with daily foetal kick count, foetal Biometry, Biophysical profile, and foetal Doppler to be done. It is advised to plan pregnancy during disease remission, with good antenatal care and close monitoring of clinical symptoms. Early diagnosis of complications and its treatment result in good maternal and fetal outcome.

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