Revisiting epidural anaesthesia in a parturient with idiopathic pulmonary hypertension posted for caesarean section

Sir,

A 25-year-old, unregistered, term pregnant woman presented with a history of dyspnoea on exertion (New York Heart Association 2) since 3 months. She gave a history of admission to a rural hospital for shortness of breath 10 years ago, where she was investigated and told to have some cardiac ailment, but was not started on any medication. She was asymptomatic after that. On examination, her blood pressure (BP) was 130/70 mmHg, pulse was 88/min, regular and respiratory rate was 26/min. Cardiovascular system examination revealed right parasternal heave, second intercostal space dullness and grade 4 pan systolic murmur in pulmonary area. Respiratory system examination was normal. The SpO_2 was 90% on air and increased to 94% with supplemental 4 L/min O_2. Haemogram, coagulation profile, liver and kidney function tests were within normal limits. Electrocardiogram showed sinus rhythm with right axis deviation with right ventricular hypertrophy with strain. Two-dimensional echocardiography (2 D ECHO) revealed right ventricular hypertrophy with mean pulmonary arterial pressure of 60 mmHg with no associated valvular lesion. The diagnosis of idiopathic (primary) pulmonary hypertension (PPH) was made. Patient was started on tablet sildenafil 25 mg TDS and tablet lasix 20 mg BD by the cardiologist. Patient was posted for emergency caesarean section after 2 days as she went into labour. The plan of anaesthesia was to perform the surgery under epidural anaesthesia. Epidural catheter was inserted at T12-L1 and after test dose of 3 cc of 2% lignocaine with adrenaline (1 in 2 lac), 6 cc of 0.5% bupivacaine and 4 cc of 2% lignocaine with adrenaline and 25 μg of fentanyl diluted up to 12 cc was given slowly. Surgery was started after achieving a sensory block level of T7. Vitals were stable throughout intraoperative period. There was one episode of hypotension (80/60 mmHg), which was treated with intravenous (iv) mephentermine 3 mg. Although pulmonary artery (PA) pressure monitoring is recommended by some, we did not use it as the surgery did not involve major fluid shifts and there

is a risk of PA rupture during insertion of PA catheter in patients with pulmonary hypertension.[1] After the baby was delivered, Pitocin by infusion, iv midazolam 0.5 mg and iv fentanyl 50 μg were administered. Patient was shifted to post-anaesthesia care unit for observation for 48 h. Epidural topups were given for next 48 h. 2D ECHO on 6th post-operative day revealed persistent mean PA pressure of 60 mmHg.

PPH (now idiopathic) is defined as a sustained elevation of PA pressure (mean pressure greater than 25 mmHg at rest or 30 mmHg during exercise) in the absence of a demonstrable cause. Pulmonary vasoconstriction, medial hypertrophy, thrombosis *in situ* and dysfunctional pulmonary vascular endothelium are believed to contribute to the cause.[2] Pulmonary hypertension is tolerated poorly in a parturient. Deterioration typically occurs in the second trimester with symptoms of fatigue, dyspnoea, syncope and chest pain. This corresponds to the physiological increase in cardiac output and blood volume of 40%. During labour, uterine contractions effectively add 500 ml of blood to the circulation. The pain and expulsive effort of labour increase right atrial pressure, BP and cardiac output.[3] When PPH is not diagnosed until late in pregnancy an elective delivery is preferred. This facilitates cooperation between specialities, permits monitoring to be started in advance, the pain and haemodynamic consequences of labour to be minimized and an intensive care bed arranged. Mangano[4] outlined the principles for management of delivery in these patients as avoidance of increases in pulmonary vascular resistance (PVR) and maintenance of right ventricular preload, left ventricular after-load and right ventricular contractility. Sildenafil decreases the PA pressure. It has the advantage of oral medication and can be taken chronically. Most reported cases have recommended vaginal delivery under epidural analgesia.[5,6] O'Hare *et al*. observed a mortality rate of 50% for vaginal delivery and approaching 100% for caesarean section in patients with primary pulmonary hypertension.[7]

Pain, oxygen consumption and the haemodynamic consequences of labour can be reduced with epidural analgesia. Direct laryngoscopy and endotracheal intubation increases sympathetic nervous system activity and can lead to increase in PVR and acute right heart failure. During general anaesthesia, the anaesthesiologist is continually managing the balance between excessive sympathetic outflow and potential acute right heart failure on one hand and excessive depth of anaesthesia, low cardiac output, low coronary perfusion and cardiovascular collapse on the other hand. A healthy patient tolerates these variations well, but a patient with severe pulmonary hypertension has limited reserve to tolerate these changes. Spinal anaesthesia is avoided due to precipitous fall in BP which can be detrimental in these patients. Smedstad *et al*.[5,8] in their study have reported eight cases of pulmonary hypertension with pregnancy. One of these cases was primary pulmonary hypertension and was successfully managed with epidural anaesthesia.

Thus, although controversial, we successfully used epidural anaesthesia for caesarean section in a parturient with idiopathic pulmonary hypertension with successful outcome.

Manas Vithal Manohar, Archana Vaidya, Sandhya Bakshi

Department of Anaesthesiology, Government Medical College, Nagpur, Maharashtra, India

Address for correspondence:
Dr. Manas Vithal Manohar,
C, 304, 305, Kingston Heights, Chincholi Bunder Road, Malad West, Mumbai - 400 064, Maharashtra, India.
E-mail: manas3485@gmail.com

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