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Ultralow dose combined spinal−epidural anesthesia for cesarean section in ritodrine-related severe pulmonary hypertension

To the Editor:

We report three successful anesthetic managements of cesarean delivery in patients with ritodrine-related severe pulmonary hypertension. Institutional Review Board approval and the patients' written informed consent were obtained. Baseline demographics between the patients were similar—age: 28, 31, and 32 years; body weight: 69, 72, and 68 kg; height: 160, 163, and 158 cm; gestational age: 38, 37, and 38 weeks; mean blood pressure (BP): 98, 107, and 95 mmHg; mean pulmonary circulation BP: 89, 92, and 85 mmHg; and left ventricular ejection fraction: 42%, 45%, and 51%, respectively.

Before conducting regional anesthesia, an arterial line and a central venous catheter were set up for continuous BP and central venous pressure monitoring, respectively. A combined spinal−epidural anesthesia was performed at the L3/4 interspace using the loss-of-resistance to air technique with a 16-G Tuohy needle. Approximately 3 mL of 2% lidocaine was then given through an epidural catheter as a test dose. Subsequently, the dura was punctured with a 27-G Whitacre spinal needle, and 4 mg of 0.5% hyperbaric bupivacaine (diluted with normal saline to 3 mL) was administered. Intermittently, 3 mL of 2% epidural lidocaine was topped up to reach a sensory block level of T5, with a Bromage score of 1−2 points in the three patients. Two cases experienced a moderate drop in BP (less than 40% of the baseline value) after induction, and received an intermittent bolus of vasopressor (ephedrine: 8 mg) to rescue the falling BP level. One patient received continuous norepinephrine infusion for severe drop in BP (greater than 40% of the baseline value). Adverse effects such as shivering, pruritus, and nausea or vomiting did not occur in any of the parturients. All patients stayed in the postanesthesia care unit (PACU) postoperatively with close monitoring for 2 hours and were then transferred to the ordinary ward uneventfully.

We believe that this is the first report demonstrating the application of obstetric anesthesia in ritodrine-related severe pulmonary hypertension. Ritodrine, a beta-2 sympathomimetic agent, can cause pulmonary edema in previously healthy parturients [1]. Rise in pulmonary capillary pressure had been observed in patients receiving tocolytic therapy with ritodrine [2,3]. In our cases, all patients were healthy before pregnancy. Pulmonary hypertension developed after prolonged use of ritodrine. Ritodrine was discontinued before cesarean section, and mean pulmonary BP returned to normal range in all patients in the PACU. This clinical finding highlighted the importance of maintaining perioperative hemodynamic stability in these patients. Different from primary pulmonary hypertension, their symptoms could completely recover after discontinuing ritodrine. As a result, efforts to minimize the perioperative increase in pulmonary vascular resistance are crucial. We believe that with more careful titration of epidural anesthetics, it can provide desirable anesthetic properties with good hemodynamic stability, fewer invasive monitors, and less need of intensive care.

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