

## Role of dexmedetomidine and sevoflurane in the intraoperative management of patient undergoing resection of pheochromocytoma

Sir,

In pheochromocytoma surgery, dexmedetomidine and sevoflurane could be useful agents in minimising episodes of abrupt arterial hypertension expected during intubation of trachea and manipulation of the tumour. Pharmacological properties of dexmedetomidine and sevoflurane are suitable for maintenance of haemodynamic stability. We report anaesthetic management of a case of pheochromocytoma resection using combination of dexmedetomidine and sevoflurane.

The patient received phenoxybenzamine and atenolol for 2 weeks before surgery. Preoperatively adequate fluids were given to the patient to restore plasma volume. On arrival in the operating room, invasive arterial pressure recorded through an intraarterial line in the left radial artery was 126/70 mm Hg. In the operating room loading dose of dexmedetomidine 1 µg/kg was given over 10 min followed by continuous infusion of 0.5 µg/kg/h. General anaesthesia was induced with fentanyl 100 µg, propofol 100 mg, continuous infusion of dexmedetomidine, sevoflurane

2% and vecuronium 8 mg. The intraoperative monitoring consisted of electrocardiography, heart rate (HR), pulse oximeter, end tidal CO<sub>2</sub>, invasive blood pressure (BP), central venous pressure (CVP), urine output, arterial blood gases and glucose. Maintenance of anaesthesia was done with 2–5% sevoflurane in oxygen-nitrous mixture and infusion of dexmedetomidine. Intubation of trachea was smoothly performed. However during manipulation of tumour, BP and HR increased abruptly. These changes were controlled by increasing the concentration of sevoflurane to 5%. When BP returned to the baseline value, the concentration of sevoflurane was decreased to 2%. After the ligation of adrenal vein BP dropped to 70/36 mm Hg which improved by decreasing the concentration of sevoflurane and administration of fluids. CVP was maintained around 10–12 mm Hg. The patient was extubated uneventfully 15 min after the completion of the surgery and was shifted to intensive care unit for monitoring.

Anaesthetic management of pheochromocytoma is extremely challenging for the anaesthesiologists due to severe episodic hypertension during intubation and manipulation of the tumour necessitating the use of hypotensive agents. Preoperative α blockage, intraoperative vasodilators and increasing the depth of anaesthesia are the measures taken to prevent wide swings in haemodynamic changes. Dexmedetomidine is a selective α<sub>2</sub>-adrenoceptor agonist and has sedative and analgesic properties. The decreased BP and HR are attributed to the low catecholamine level. It has been reported that perioperative use of dexmedetomidine provides a steady haemodynamic course and blunts fluctuations at stressful moments like intubation and extubation<sup>[1]</sup> and has been described for pheochromocytoma.<sup>[2,3]</sup>

In another study dexmedetomidine administered 15 min before the induction of anaesthesia attenuated the haemodynamic responses to laryngoscopy and endotracheal intubation and diminished the isoflurane requirements during abdominal hysterectomy.<sup>[4]</sup>

Kallio *et al.*<sup>[5]</sup> showed that dexmedetomidine caused a dose dependent decrease in arterial BP and HR and decline in plasma level of norepinephrine. In order to blunt the intubation stress, we administered a loading dose of dexmedetomidine of 1 µg/kg before induction and the patient remained haemodynamically stable. After the loading dose, the infusion was maintained at 0.5 µg/kg/h. However during manipulation of

tumour, BP and HR abruptly increased. These changes were controlled by increasing the concentration of sevoflurane. The low solubility of sevoflurane in blood and fat indicates that it is an anaesthetic agent with which the anaesthetic level may be rapidly altered and controlled. In our case, the intraoperative hypotensive or hypertensive events have been rapidly controlled, most often only by adjustment of the concentration of sevoflurane. Similar results were obtained by Doi and Ikeda<sup>[6]</sup> and Tanaka *et al.*<sup>[7]</sup> had reported that the combination of continuous epidural block and sevoflurane anaesthesia was very useful for removal of pheochromocytoma.

In summary, we describe the management of patient of pheochromocytoma in which the combination of dexmedetomidine and sevoflurane was very effective to control hypertensive surges in the patients who are adequately prepared preoperatively.

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