

Anaesthesia for thymectomy: Use of ketamine-dexmedetomidine without muscle relaxant

Sir,

Myasthenia gravis poses challenges to Anaesthesiologists due to the involvement of neuromuscular junction (NMJ). The main concerns being the post-operative muscle weakness and limitations with the use of anaesthetic and neuromuscular blockers.

We present a case report of a successful management of a patient with myasthenia gravis for thymectomy with ketamine-dexmedetomidine for induction of anaesthesia and desflurane-dexmedetomidine infusion for maintenance and discuss the advantages of using a combination of these drugs.

A 13-year old boy, diagnosed with myasthenia gravis, treated with tablet (T.) pyridostigmine was scheduled for a trans-sternal thymectomy. Since his antibody levels were still high even with medical management a total plasmapheresis was done 12 h prior to surgery.

Pre-operative assessment revealed a possible difficult airway since his thyromental distance was short. Clinical examination revealed no other cardio-respiratory abnormality.

Pre-operatively, the boy was not pre-medicated and the usual dose of T. pyridostigmine was given. Anaesthesia was induced with injection (inj.) ketamine (2 mg/kg) and inj. Dexmedetomidine (1 mcg/kg) and inj. atropine (0.01 mg/kg) given slowly over 3 min followed by inj. midazolam (0.05 mg/kg). In anticipation of prolonged time required for a difficult intubation, anaesthesia was further deepened with oxygen and nitrous oxide and increasing concentrations of Sevoflurane.^[1,2] On entropy reaching 40, the trachea was intubated with appropriate size endotracheal tube (7.0 mm internal diameter) using a stillette and external laryngeal manipulation in a single attempt. Jaw relaxation was complete, laryngoscopy easy and there was no coughing or movement. Anaesthesia was maintained with desflurane 3%, fentanyl (single dose of 2 mcg/kg at incision) and dexmedetomidine infusion at 0.5 mcg/kg/h in oxygen/nitrous oxide (30:70). Hemodynamic and ventilatory parameters were

satisfactory through out the procedure. After sternal closure, local anaesthesia with 0.25% bupivacaine was infiltrated around the wound and drain site and the inhaled anaesthetics and dexmedetomidine infusion were discontinued. The patient emerged from anaesthesia in 8 min. Trachea was extubated inside operation theatre. Post-operatively, he had no complaints of muscle weakness and was very calm and comfortable. Post-operative analgesia was given by intravenous infusion of inj. morphine (10 mcg/kg/h). He was restarted on T. pyridostigmine and his recovery was uneventful.

Two techniques have been recommended for general anaesthesia in myasthenia gravis.^[1,2] The non-muscle relaxant technique used deep inhalational anaesthesia or narcotics for intubation and maintenance, while the second balanced technique uses a judicious dose of neuromuscular blocker. We preferred the former to facilitate rapid recovery to spontaneous ventilation and prevent delayed recovery from neuro muscular blockers.

Dexmedetomidine-ketamine combination have been reported to have stable hemodynamic and ventilatory parameters facilitating airway manipulation.^[3] Dexmedetomidin, an alpha 2 agonist, with sedative hypnotic properties and sympathoinhibitory activity is a good adjuvant in balancing the cardiostimulatory effects and the adverse central nervous system effects of ketamine.^[4] The addition of atropine prevented any bradycardia or hypotension during intubation. We found the patient well anaesthetized, spontaneously ventilating and the laryngoscopy satisfactory with no movement during a difficult tracheal intubation inspite of sparing neuro muscular blockers.

Dexmedetomidine has an anaesthetic sparing effect^[5] and an infusion of dexmedetomidine after a single fentanyl bolus dose along with desflurane appears to provide adequate relaxation for sternotomy and sternal retraction without the use of any muscle relaxant. Desflurane does not inhibit the NMJ transmission but acts on the spinal cord at a segmental level, both on corticospinal to alpha-motorneurons and interneuron synapses.^[6] Desflurane is also ideal because of its rapid onset and fast elimination leading to rapid recovery with stable hemodynamics. In our patient, the combination provided adequate depth of anaesthesia for sternotomy and sternal retraction. Supplemental analgesia with local infiltration of the

wound site at the end of the surgery also aids the rapid recovery.

Desflurane and dexmedetomidine infusion for maintenance of anaesthesia provides effective analgesia reducing the requirements of opioids and helps in rapid recovery from anaesthesia after surgery, with minimum impact at the NMJ.

We conclude that ketamine-dexmedetomidine induction with desflurane-dexmedetomidine maintenance without the use of muscle relaxants is highly suitable for patients with myasthenia gravis with respect to smooth induction, hemodynamic stability, effective analgesia and minimal post-operative muscle weakness.

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