

## Amyotrophic lateral sclerosis and anaesthetic challenges: Perioperative lignocaine infusion- an aid

Sir,

Amyotrophic lateral sclerosis (ALS) is a rare fatal neurodegenerative disease characterized by rapidly progressive muscular paralysis.<sup>[1]</sup> We report anaesthetic management of a 48-year-old male, weighing 50 kg presented with a painful abdomen and fever for 3 days. Appendicular abscess suspected by ultrasonography was confirmed by a computed tomography (CT) scan. He was planned for exploratory laparotomy under general anaesthesia. He was a diagnosed case of ALS for five years when he had developed a slow onset, progressive, asymmetric weakness of upper limbs and lower limbs with associated difficulty in walking, had a progressive course and developed dysphagia and dysarthria and was on oral Riluzole 100 mg/day for last 3 years. The patient was hemodynamically stable and routine laboratory investigations were within normal limits except for raised white blood cell (WBC) count. Arterial blood gas (ABG) revealed  $P_{CO_2}$  of 43.1 mmHg and oxygen saturation of 92% on room air. Pulmonary function tests could not be performed in view of emergency surgery. The patient was induced with 80 mcg fentanyl and 2 mg/kg of propofol. 10 mg of rocuronium was administered, prior to endotracheal intubation. Prior to the start of surgery, the patient was given a bolus of 1.5 mg/kg lignocaine followed by an infusion of 0.5 mg/kg/hr to decrease post-op pain. Anaesthesia was maintained with continuous infusion of propofol at 0.05-0.1 mg/kg/min. No additional top-up of muscle relaxant was given. Surgery was completed without any significant sequelae, and total anaesthesia time was 150 min. Glycopyrrolate (0.2 mg) and neostigmine (2.5 mg) were used to reverse the effects of muscle relaxants. On meeting the extubation criteria, the patient was extubated and was observed in the post-anaesthesia care unit (PACU) for about 1 hour until he reached the discharge criteria. ABG conducted in PACU showed  $PCO_2$  47.5 mmHg and oxygen saturation of 91% on room air. The patient was comfortable, pain-free (visual analogue score (VAS) 1-2) and did not demand any analgesic in the postoperative period for the first 24 hours. ALS causes the degeneration of upper and

lower motor neurons.<sup>[2]</sup> leading to muscle atrophy, muscle spasticity, and muscle weakness.<sup>[1]</sup> In the majority of ALS patients, the respiratory failure and death are mainly caused due to atrophy and weakness of the respiratory muscles.<sup>[2]</sup> limiting the survival to 2-5 years after the onset of the disease.<sup>[3]</sup> Aspiration or ventilatory depression can be caused by general anaesthesia due to abnormal response of muscle relaxants whereas spinal anaesthesia can exacerbate the preexisting neurological diseases.<sup>[4]</sup> Thus, anaesthesia needs modification, short-acting agents must be used to prevent an unpredictable response to muscle relaxants and to ensure quick reversal in a patient of ALS.<sup>[5]</sup> The depolarizing neuromuscular blocking drugs may increase rhabdomyolysis and massive hyperkalemia in such patients.<sup>[6]</sup> Therefore, the use of succinylcholine was avoided in this patient admitted for emergency laparotomy. The non-depolarizing neuromuscular blocking drugs and reversal agents both should be used judiciously, under a peripheral nerve stimulation monitor due to increased susceptibility of patients with motor nerve diseases.<sup>[7]</sup> The normal intubating dose of rocuronium (a non-depolarizing muscle relaxant) is 1.0 mg/kg, therefore, a low dose (only 10 mg) was used in this case. No additional top-up was given and the patient was maintained on propofol infusion. Epidural was avoided as it can exacerbate the disease condition. The presence of muscle rigidity can decrease the post-operative respiratory function hence the opioids should be used with caution. Therefore, an infusion of lignocaine was used peri-operatively to provide postoperative analgesia and to reduce the opioid requirement. The patient tolerated lignocaine infusion without any adverse effects. Paracetamol was given intravenously four times a day postoperatively. Though PCA with fentanyl was attached for the relief of postoperative pain. However, the need for any bolus was not required for the first 24 hours. The patient was discharged in a stable condition at postoperative day 7. Thus, in patients who require general anaesthesia, one can use lignocaine infusion that has little effect on the progression of the disease as well as significantly decreases the requirement of opioids for pain relief.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and

due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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