A Patient with Prolonged Paralysis

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CASE 1

A 19-year-old Asian male with no notable medical history presented to the emergency department with a 12 h history of acute abdominal pain. The patient's condition was diagnosed as acute appendicitis, and he underwent an emergent laparoscopic appendectomy. A 1-mg dose of vecuronium followed by 120 mg of succinylcholine was administered to induce paralysis and facilitate endotracheal intubation.

The progression of the patient's muscle relaxation was monitored intraoperatively with a train-of-four twitch monitor and was marked by fewer stimuli making it across the neuromuscular junction. In general surgeries, a neuromuscular block down to 2 twitches is adequate for rapid sequence induction. Normally, a dose of 0.5–2 mg succinylcholine per kilogram body weight completely abolishes the muscle response to nerve stimulation. Within 2 to 2.5 min, the neuromuscular junction starts to show signs of recovery, or twitches. In this case, the patient was administered 1.7 mg/kg succinylcholine. After the appendectomy was completed, however, the patient uncharacteristically remained paralyzed for 1.75 h. He showed no muscle twitches, no spontaneous inspiratory efforts, and no protective airway reflexes. He subsequently required sedation and assisted ventilatory support.

Questions to Consider
• What are the pharmacodynamic properties of succinylcholine?
• What is the role of butyrylcholinesterase in the pharmacokinetics of succinylcholine?
• What conditions can cause delayed recovery from succinylcholine administration?
• What additional testing should be used to further evaluate this patient?

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the March 2012 issue of Clinical Chemistry. To view the case and comments online, go to http://www.clinchem.org/content/vol58/issue3 and follow the link to the Clinical Case Study and Commentaries.

Educational Centers

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