LETTER TO THE EDITOR

Cardiac Arrest After Succinylcholine Administration in a Patient Recovering from Guillain-Barre Syndrome

Sir,

Succinylcholine is one of the first-line neuromuscular blocking drugs used for emergency as well as elective endotracheal intubations because of its fast onset and short duration of action.1 But it can have some serious side effects like hyperkalemia and malignant hyperthermia. Hyperkalemia may occur with increased frequency in certain conditions, such as trauma, burns, infection, and certain neuromuscular disorders.2

A 26 years old male presented with 3 days history of weakness of all four limbs. Neurological examination revealed power of 2/5 in both lower limbs and 3/5 in upper limbs with absent deep tendon reflexes while the sensations, cranial nerves and higher mental functions were intact. CSF examination showed albuminocytologic dissociation. Nerve conduction studies showed increased latency, decreased velocity, low amplitude and delayed F-waves. A final diagnosis of Guillain-Barre syndrome was made. The patient was managed with oxygen, prophylactic antibiotic, plasmapharesis and low molecular weight heparin. He showed a gradual improvement after 4 sessions of plasmapharesis. On 10th admission day, he developed sudden severe shortness of breath after a new central venous line was passed due to blockage of the previous catheter. An iatrogenic pneumothorax was suspected which was later on confirmed on chest X-ray. A chest tube was passed. The patient showed some improvement but he started tiring out and oxygen saturation was dropping. Emergency endotracheal intubation was performed using midazolam and mechanical ventilation was started.

On the second day of mechanical ventilation, there was decreased air entry on the right lower chest. Bronchoscopy was planned to rule out any mucus plugging. A bronchoscopy showed increased latency, decreased velocity, low amplitude and delayed F-waves. A final diagnosis of Guillain-Barre syndrome was made. The patient was managed with oxygen, prophylactic antibiotic, plasmapharesis and low molecular weight heparin. He showed a gradual improvement after 4 sessions of plasmapharesis. On 10th admission day, he developed sudden severe shortness of breath after a new central venous line was passed due to blockage of the previous catheter. An iatrogenic pneumothorax was suspected which was later on confirmed on chest X-ray. A chest tube was passed. The patient showed some improvement but he started tiring out and oxygen saturation was dropping. Emergency endotracheal intubation was performed using midazolam and mechanical ventilation was started.

On the second day of mechanical ventilation, there was decreased air entry on the right lower chest. Bronchoscopy was planned to rule out any mucus plugging. A larger bore endotracheal tube was to be passed. Patient was given 10 mg of suxamethonium. The patient went into sudden cardiac arrest. The continuous ECG monitoring showed tall T-waves followed by pulse-less electrical activity. CPR was immediately started and the patient was revived after 10 minutes. He had a regular palpable pulse with blood pressure of 70/30 mmHg so ionotropic support was started. Arterial blood gas data from the sample, obtained 1 minute into resuscitation, showed pH of 7.10, PCO2 of 54 mmHg, PO2 of 96 mmHg and HCO3 at 14 mEq/L. Serum K measured from the sample was 7.9 mEq/L. Serum K after the stabilization of the patient was 4.6 mEq/L. After resuscitation, the patient was hemodynamically stable and was in sinus rhythm but he suffered a hypoxic ischemic brain injury. At present, after 3 months of cardiac arrest episode, the patient is alive but in vegetative state.

The cause of cardiac arrest in this patient was undoubtedly hyperkalemia. The pathophysiology of hyperkalemia following succinylcholine administration in patients with neurological injury is thought to be proliferation of the cholinergic receptors, which are normally confined to neuromuscular junction, which results in larger amount of potassium being released with succinylcholine use.3 This case and the review of literature shows that succinylcholine has been associated with cardiac arrhythmias in GB syndrome patients and its use should be clearly avoided.

Non-depolarizing neuromuscular blocking agents may be considered for intubation in patients in whom succinylcholine is contraindicated. Rocuronium has the most rapid onset of the currently available non-depolarizing neuromuscular blocking agents and it is emerging as an attractive alternative to succinylcholine.4 Sedative drugs like Midazolam and Fentanyl may also be considered but these are not muscle relaxants. Studies are required to compare the relative efficacy and safety of non-depolarizing neuromuscular blocking drugs (e.g. Rocuronium) and sedative drugs (e.g. Midazolam and Fentanyl) for endotracheal intubation in patients in whom suxamethonium is contraindicated like the patients of Guillain-Barre syndrome.

REFERENCES


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