[NM-252] Tonic-clonic seizures after general anesthesia

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Intraoperative seizures pose several challenges to the anesthesiologist. It requires rapid recognition, management, and treatment of reversible causes. Common etiologies of intraoperative seizures include electrolyte disturbances, hypoglycemia, hypoxemia, and medication or surgical-related effects. Although rare, anesthetics as a cause of seizures must also be considered. We present a case of a patient who had several episodes of tonic-clonic seizures after emergence from general anesthesia.

A 16-year-old male, recently diagnosed with osteosarcoma, presented for a port-a-cath insertion and bone marrow aspiration. He had no history of complications with anesthesia. He received lidocaine, propofol, and fentanyl for induction and was mask ventilated with sevoflurane prior to intubation. Anesthesia was maintained with sevoflurane. At the end of the case, he was extubated without complications. Five minutes later, he had a tonic-clonic seizure lasting 20 seconds. He had 2 subsequent episodes of seizures. During these episodes, midazolam 2mg and lorazepam 2mg were given. Labs showed normal electrolytes and glucose. Vitals were stable throughout. He had no neurological deficits and had intact mental status between episodes. He was given a loading dose of fosphenytoin. On arrival to the PICU, he had additional seizures and was given a dose of keppra. He became more somnolent and was intubated. A non-contrast head CT was normal. A 24 hour video-EEG showed no epileptiform activity. He was extubated the next day and had no other seizure activity. Anti-epileptic drugs were discontinued. With all diagnostic tests normal, it was thought that the seizure activity was related to anesthetics.

Many anesthetic agents have proconvulsant properties. Although rare, many can induce epileptiform changes on EEG and lead to the development of seizure activity. Sevoflurane, which was used in the patient, has been associated with epileptiform discharges. The incidence of seizure-like activity during induction or emergence from sevoflurane is reported to be 6%. Risk factors include high concentrations of sevoflurane, rapid increases in concentration, hyperventilation, and the induction or emergence period. Avoiding hypocarbia and using <1.5 MAC of sevoflurane are suggested. Propofol, also used in the patient, is well-known as an anticonvulsant. It is a GABA agonist, used safely in epileptic patients, and successfully used in treating refractory status epilepticus. However, there are reports of propofol-associated seizures to suggest proconvulsant properties. It is also associated with myoclonus and other unusual movements. Seizure-like activity with propofol occurs more often during induction or emergence when cerebral propofol levels are in flux.

The underlying mechanism for anesthetic-related seizure activity is still unknown, but recognizing which agents are proconvulsants may help minimize the risk of seizures in susceptible patients. In addition, knowing how to rapidly manage intraoperative seizures and treat reversible causes are crucial to decrease significant neuronal damage.

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