Suxamethonium chloride

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Worsening malignant hyperthermia, leading to cardiac arrest, in a child: case report

A 6-year-old Caucasian boy had malignant hyperthermia aggravated by suxamethonium chloride [succinylcholine chloride], leading to cardiac arrest and death.

The boy developed an inability to bend his legs after playing outside for less than 10 minutes on a hot, humid day. He reported that his heart felt like it was pounding out of his chest. His temperature was 104°F when measured by his mother, who unsuccessfully tried to cool him. En route to the emergency department, he reported being unable to open his mouth. At emergency department admission, he was sweating profusely and appeared to have generalised seizures. His rectal temperature exceeded 108.9°F, his RR was 60 breaths/min and his HR was 190 beats/min. He was treated with benzodiazepines and other sedative hypnotics, atropine, IV fluids and external ice packs, and his respiration was assisted; tachycardia continued throughout. As he was in respiratory distress, an endotracheal tube was placed 19 minutes into treatment, using IV suxamethonium chloride 20mg. However, jaw relaxation did not occur, and another dose of IV suxamethonium chloride 20mg was given a minute later, with paracetamol [acetaminophen]. Almost immediately, bradycardia developed, then asystole.

The boy received advanced cardiac life support with atropine, ceftriaxone, bicarbonate and epinephrine [adrenaline]. Ten minutes after the second dose of suxamethonium chloride, his plasma potassium level was 9.4 mEq/L. A spontaneous cardiac rhythm never returned, and he was pronounced dead. Records revealed that he had prominent lumbar lordosis and did not walk until 17 months of age; he had periodically reported leg pain. About 2-3 weeks before his death, he had noted overheating and stomach cramps while playing outside. Based on negative autopsy and postmortem studies, the presence of muscle rigidity with extremely high temperature, and the adverse response to suxamethonium chloride, the cause of death was determined to be malignant hyperthermia. Postmortem genetic analysis revealed a novel *RyR1* variant, Gly4820Arg, in exon 100.

Author comment: " *[T]his is a case of "awake" malignant hyperthermia worsened by succinylcholine . . . The administration of succinylcholine likely increased rigidity and precipitated hyperkalemic cardiac arrest*".

Lavezzi WA, et al. Case report: Death in the emergency department: an unrecognized awake malignant hyperthermia-like reaction in a six-year-old. Anesthesia and Analgesia 116: 420-423, No. 2, Feb 2013. Available from: URL: http://dx.doi.org/10.1213/ANE.0b013e3182768f99 - USA 803085226