

P12

USE OF SUGAMMADEX IN A PAEDIATRIC INTENSIVE CARE PATIENT

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Description

A 15 year old boy was transferred from their local hospital to the PICU after an emergency laparotomy for faecal peritonitis, secondary to a perforated Meckel's diverticulum. Profoundly septic and in multi-organ failure; they required continuing ventilation with high oxygen requirements, multiple inotropes and haemofiltration. 10 days post-admission, his ventilatory requirements improved and off inotropic support. However, he continued to require haemofiltration for his ongoing renal failure. The Vecuronium infusion was stopped 3 days prior to neurological assessment; however it was noted that he continued to have significant muscle weakness, only being able to slightly move his toes and fingers. He was triggering on the ventilator but requiring moderate amounts of pressure support.

A nerve conduction monitor was used which showed a train-of-four ratio (TOFr) of 0.7, indicating partial muscle paralysis. A decision was made to use Sugammadex for reversal of neuromuscular paralysis. A 2mg/kg dose was given was administered intravenously. After 2 minutes, he was able to extend and flex his toes, fingers, wrists elbows and ankles against gravity. He also was producing higher tidal volumes and required weaning of his ventilator settings. Using the nerve conduction monitor, he had a TOFr of 0.8. A decision was made to give a repeat dose with further improvement in his movement and a TOFr of 0.9.

Discussion

Vecuronium is a neuromuscular blocking agent (NMBA) used commonly in PICU as an infusion to maintain. Its elimination from the body is dependent on liver and kidney function. Sugammadex is a modified cyclodextrin used in the reversal of non-depolarising aminosteroid NMBAs such as Rocuronium and Vecuronium. It is designed to encapsulate these NMBAs by forming a complex at the neuromuscular junction, preventing its action with a rapid return of neuromuscular function. Its use is commonly seen in adult anaesthesia practice although use in paediatric patients in the perioperative period has increased [1]. However, cases of Sugammadex use similar to this case in the PICU has not been reported.

Points of discussion are: The BNFC recommended dosing of Sugammadex is 2mg/kg for children; however a total of 4mg/kg of Sugammadex was used in this. A study has showed 4mg/kg dose was effective and safe in rocuronium-induced muscle paralysis [2]. Sugammadex is relatively contraindicated in renally-impaired patients (CrCl <30ml/min) as the sugammadex-NMBA complex is detectable in plasma for seven days and removal of this complex requires high-flux haemodialysis [3].

This case highlights the use of Sugammadex in a renally-impaired patient with ongoing muscle paralysis despite cessation of Vecuronium and being haemofiltered. Sugammadex could have further uses outside the immediate perioperative period in paediatric anaesthesia and intensive care.

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References:

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