blocking agent instead of suxamethonium should be considered, especially when those risk factors are present[1,2] and the use of a rocuronium-sugammadex appears to be a safe and useful option. Since ECT is generally repeated at short intervals, accumulation of sugammadex should be considered, especially in patients with renal insufficiency.

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Sugammadex in the management of a failed intubation in a morbidly obese patient

Sugammadex, in a dose of 16 mg/kg, has been shown in clinical studies to be effective for the immediate reversal of neuromuscular blockade after intubating doses (1 to 1.2 mg/kg) of rocuronium[1,2]. It has therefore been recommended as a rescue technique in failed intubation situations although reports of its use in this setting are lacking. We were recently faced with a 'can't intubate, can't oxygenate' scenario in a morbidly obese patient undergoing a bariatric procedure, in which the use of sugammadex allowed the restoration of spontaneous ventilation and safe emergence from anaesthesia. The patient gave permission for the publication of this report.

A 35-year-old female (weight 110 kg, height 169 cm, body mass index 38.5 kg/m^2) presented for a laparoscopic sleeve gastrectomy. Her preoperative airway assessment revealed a Mallampati 3 view, a large tongue and a thyromental distance of greater than 6 cm with neutral jaw excursion. After preoxygenation, anaesthesia was induced with midazolam 1.5 mg, fentanyl 150 μg and propofol 250 mg. Rocuronium 50 mg was then given. After loss of consciousness bag-mask ventilation was attempted which was difficult, requiring a Guedel airway and two-person technique. Approximately two minutes after induction, with the SpO_2 at 98%, a direct laryngoscopy was performed. This revealed a Cormack and Lehane Grade 4 view. Bag mask ventilation was reattempted but this proved to be more difficult than when used prior to laryngoscopy.

A Glidescope (Saturn Biomedical Systems Inc, British Columbia), which had been set up in the theatre in preparation for a potentially difficult airway, was then inserted. This also revealed a Grade 4 view, which improved on repositioning of the Glidescope, but attempts at placement of a bougie into the trachea failed. The patient then began to desaturate, at which point the Glidescope was removed and attempts were made to resume bag-mask ventilation. This proved more difficult than previous attempts, and no convincing capnography trace could be detected, while the SpO_2 decreased to 69% with the patient appearing clinically cyanosed.

At this point an emergency was declared. An intubating laryngeal mask was inserted but ventilation was still not possible. A decision to administer sugammadex was made. A total of 700 mg was administered. This was approximately five minutes after the rocuronium had been given. Within 15 seconds of administration it was possible to ventilate the patient through the intubating laryngeal mask. Within 45 seconds of administration the patient was making vigorous respiratory effort sufficient to maintain her oxygenation through the laryngeal mask. A decision was made to defer the surgery and to wake the patient. Her surgery was rescheduled one month later, at which point her airway was secured with an awake fibreoptic intubation.

In this patient, the administration of sugammadex was able to satisfactorily reverse the effects of rocuronium-induced neuromuscular blockade and rescue a life-threatening 'can't intubate, can't oxygenate' situation. This avoided the need for either a needle crycothyrotomy and jet oxygenation or a surgical airway, both of which carry a significant risk of serious complications. While the dose of sugammadex used here was significantly lower than that described in clinical studies for rescue reversal, the dose of rocuronium used was also significantly less. There are currently no published studies to guide appropriate dosing of sugammadex in obese patients, although the product information for

sugammadex recommends that dosing be based on total body weight. Conceptually, in the situation of a rescue reversal it is likely that the most relevant information is the total amount of rocuronium administered as sugammadex binds to rocuronium in a 1:1 ratio.

Central to the use of sugammadex in a failed intubation setting is that it is readily available to the anaesthetist[3]. It has been recommended that sugammadex should be located in a central area in the operating theatre complex and that all staff are aware of the location of sugammadex, so as to save time in a critical situation. In the case described here a 200 mg vial was immediately available in the theatre and this was administered while the 500 mg vials were obtained. Given our experience in this case we would recommend that 500 mg vials of sugammadex be available in the operating theatre when rocuronium is used for intubation in potentially difficult airways or for modified rapid sequence inductions, as this will save time should a failed intubation occur.

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Rocuronium and sugammadex as a novel management strategy in a patient with plasmacholinesterase deficiency presenting for electroconvulsive therapy

Attenuation of motor response during electroconvulsive therapy with neuromuscular blocking drugs is recommended to prevent injury during seizures[1]. Rapid recovery of neuromuscular function is also desirable, as treatment sessions are brief. Suxamethonium possesses a short duration of action due to rapid metabolism by plasmacholinesterase and is commonly used during anaesthesia for electroconvulsive therapy. Plasmacholinesterase deficiency, therefore, presents a challenge in these patients, as suxamethonium use may result in prolonged neuromuscular blockade[2].

Neuromuscular blocking strategies for short procedures in patients with plasmacholinesterase deficiency have included using small doses of intermediate-acting non-depolarising agents[3], or reduced doses of suxamethonium[4]. However, rocuronium followed by sugammadex is a novel alternative. We present the case of a patient with known plasmacholinesterase deficiency, in whom rocuronium and its novel reversal agent sugammadex were used effectively to provide motor attenuation and rapid reversal of neuromuscular block. Patient permission for publication was obtained.

A 58-year-old female (weight 75 kg, body mass index 31.8) requiring a course of electroconvulsive therapy, was found to have plasmacholinesterase deficiency (atypical heterozygote [dibucaine-resistant] and Kalow variant homozygote). This presented at the initial treatment, when a 1 mg/kg dose of suxamethonium caused a 30 minute period of neuromuscular blockade. On subsequent occasions the combination of rocuronium with its reversal agent sugammadex was used for motor attenuation. Rocuronium 0.2 mg/kg (one-third of the normal intubating dose), was administered after 2 mg/kg of propofol. Neuromuscular monitoring with a peripheral nerve stimulator (at the ulnar nerve) was used. Motor attenuation was deemed appropriate by the anaesthetic and psychiatry teams following the seizure. Immediately following the seizure, when a train-of-four count of 2 to 3 was present, a 2.6 mg/kg dose (200 mg) of sugammadex was administered to reverse the block. There was no discernible fade with train-of-four stimulation after 60 seconds, and spontaneous unassisted ventilation resumed soon after. The time from induction of anaesthesia to resumption of unassisted ventilation was less than six minutes.

Sugammadex selectively and rapidly binds and inactivates rocuronium (and vecuronium), allowing quicker onset of neuromuscular block and reversal[5,6]. The use of rocuronium and sugammadex in this setting is advantageous, as reliable motor attenuation and rapid restoration of neuromuscular function can occur. The cost of sugammadex may limit its routine use, but this needs to be balanced against the cost of operating theatre time in patients with conditions likely to prolong muscle weakness such as severe forms of plasmacholinesterase deficiency.

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