Why do we still use suxamethonium for caesarean section?

ROCURONIUM HAS FEWER SIDE EFFECTS

The argument for retaining suxamethonium for general anaesthesia revolves around its rapid onset and short duration. Suxamethonium has served anaesthesia well for over 40 years, but has many adverse effects. Most women experience myalgia and histamine release, others suffer life-threatening cardiac dysrhythmias, anaphylactoid reactions, electrolyte disturbances, and muscle abnormalities such as malignant hyperpyrexia, masseter spasm and myotonic crises. Rocuronium provides comparable conditions for tracheal intubation without these problems.

Most pregnant women requiring general anaesthesia have a trachea that is easy to intubate. The rapid hydrolysis of suxamethonium provides no benefit for them as long-acting agents are administered before suxamethonium's effects reverse. For the 'easy intubation' rocuronium is clearly the agent of choice.

For some women the trachea can only be intubated with difficulty. If a general anaesthetic is used and securing the airway is delayed then manual ventilation will be required. When suxamethonium starts to wear off laryngoscopy becomes dangerous, manual ventilation difficult, intubating conditions deteriorate, the risk of failed intubation increases and coughing, laryngospasm and passive regurgitation may occur. These risks are reduced with rocuronium, making it the agent of choice.

But what if you fail to intubate the trachea and have to proceed? In the UK this is estimated to occur in 0.3% of obstetric general anaesthetic procedures, or about 180 women annually. The lungs require manual ventilation and the airway needs protection with cricoid pressure and a head-up position. For optimal surgical conditions a non-depolarizing agent should also be given. Again rocuronium is the agent of choice – it is illogical to administer suxamethonium then atracurium when rocuronium alone provides the same effect.

But what if you can neither intubate nor ventilate after induction? Rare, but probably less likely with rocuronium than suxamethonium as outlined earlier. At term the lung's functional residual capacity holds 1000 ml and oxygen use is about 330 ml/min. With optimal pre-oxygenation this gives 3 minutes before hypoxia and death. Cholinesterase activity falls during pregnancy and markedly so with pre-eclampsia, which itself predisposes to difficult intubation. At term an intubating dose of suxamethonium last 10 minutes or more and rocuronium 25 minutes. If you can neither intubate nor ventilate the muscle relaxant is irrelevant – the woman will be dead.

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RAPID OFFSET IS BENEFICIAL

I shall never forget Mrs B – a charming lady who insisted on general anaesthesia for her emergency caesarean section. The usual airway assessments did not prepare me for the view on laryngoscopy, and my manoeuvres did little to improve matters. We had to proceed, as the baby appeared to be even more distressed than I was. I inserted a laryngeal mask airway, maintained cricoid pressure, and gently bagged Mrs B until she began to breathe. Fortunately I had performed the rapid sequence induction with suxamethonium, so she was self-ventilating within 3 minutes.

What if I had used rocuronium for this patient? Rocuronium is essentially 'rapid-onset-vecuronium' and to achieve comparable intubating conditions to suxamethonium at 1 minute, you need to use at least 1 mg/kg. I would have had more time to attempt to intubate her, but this is no advantage – 'patients die from failure to oxygenate, not to intubate'. I also would have had to ventilate her until the rocuronium had metabolized sufficiently to be able to reverse its effects – between 30 and 72 minutes at this dose. Ventilating such patients puts them at increased risk of aspiration, even with cricoid pressure. This potential hazard is decreased if suxamethonium is used, as the drug is usually rapidly metabolized, allowing the patient to breathe spontaneously much earlier. Finally, in the 'can't intubate, can't ventilate' scenario which we all dread, a muscle relaxant which wears off quickly like suxamethonium must be more desirable.

Like all drugs, there are contraindications to the use of suxamethonium, and in those cases, rocuronium would be a suitable alternative. However, the rapid offset of suxamethonium, especially in the unanticipated difficult airway, remains its greatest raison d'etre in modern anaesthetic practice.

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