 Declaration of interest

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Sugammadex after magnesium sulphate administration in a morbidly obese patient undergoing general anaesthesia

Editor—Magnesium sulphate is believed to affect the reversal of rocuronium-induced neuromuscular block (NMB) by sugammadex.1 I recently cared for a 47-yr-old woman (weight, 110 kg; height, 163 cm; BMI, 41 kg m⁻²) with a history of arterial hypertension and ischaemic heart disease undergoing laparoscopic sleeve gastrectomy for morbid obesity. Her medications included a once-daily regimen of acetylsalicylic acid (100 mg), carvedilol (6.25 mg), and ramipril (1.25 mg). Magnesium sulphate 40 mg kg⁻¹ (lean body weight, LBW)² was given in a total of 100 ml normal saline before anaesthesia induction. Anaesthesia was induced with fentanyl 3 μg kg⁻¹ and propofol 2 mg kg⁻¹ (LBW) and maintained with desflurane and remifentanil, titrated to a state entropy value of 35 (S). After loss of consciousness, the ulnar nerve was stimulated through surface electrodes with square-wave 0.2 ms pulses, delivered as 2 Hz train-of-four (TOF) pulses at 15 s intervals. The adductor pollicis muscle response was measured acceleromyographically (TOF-Watch SX, Organon Teknik, Ireland). Stabilization, calibration, and baseline responses were recorded at the time of anaesthesia induction before rocuronium administration, and neuromuscular monitoring was continued until the TOF ratio returned to ≥ 1.0. NMB [twitch height from 91% (baseline) to 0%] was achieved with a rocuronium 0.9 mg kg⁻¹ (ideal body weight, IBW)² bolus before tracheal intubation in 90 s. NMB was maintained with subsequent boluses of rocuronium, titrated to achieve moderate NMB (T₂–T₃) (rocuronium 80 mg total dose) (Fig. 1A). Remifentanil was stopped at the end of the uneventful 90 min surgical procedure. Ondansetron 4 mg and ketoprofen 100 mg were given i.v. to reduce postoperative nausea and vomiting (PONV) and limit the use of narcotics for postoperative pain management. A second dose of magnesium sulphate 40 mg kg⁻¹ (LBW) was given. NMB was potentiated decreasing from T₂ to 7 post-tetanic counts. Sugammadex 4 mg kg⁻¹ (total body weight) was administered after 6 min to reverse the rocuronium-induced NMB. Complete reversal of NMB (TOF ratio of 1.10) was achieved within 60 s. The twitch height reached a stable value of 74% within 7 min after sugammadex administration (Fig. 1B). Desflurane was then discontinued, the patient awakened, and the tracheal tube was smoothly removed. The patient had no evidence of pain, PONV, signs of residual

Fig 1  Completed (a) and detailed (a) TOF tracing from a morbidly obese patient undergoing laparoscopic sleeve gastrectomy under general anaesthesia. Rocuronium-induced NMB was induced with rocuronium 0.9 mg kg⁻¹ and maintained with boluses of rocuronium (total dose of 80 mg) titrated to achieve a moderate (T₂–T₃) NMB (a). Magnesium sulphate 40 mg kg⁻¹ was administered near tracheal intubation and extubation, before anaesthesia induction, and the reversal of NMB (a and a). Reversal of NMB was achieved with sugammadex 4 mg kg⁻¹ (a and a). The blue lines represent first twitch values (twitch height, %), the dashed blue lines correspond to the post-tetanic counts, the red dots are the TOF ratios, and the continuous blue line above represents the temperature expressed as degree Celsius (°C).
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Prolonged diaphragm dysfunction after interscalene brachial plexus block and shoulder surgery: a prospective observational pilot study

Editor—Interscalene blocks (ISB) result in a decrease in forced vital capacity (FVC) of 20–25%, secondary to ipsilateral hemidiaphragmatic paralysis (DP) which is known to occur in up to 100% of patients. This is known to resolve upon resolution of the anaesthetic block. However, several cases of prolonged diaphragmatic dysfunction (PDD) have been reported post-ISB, some asymptomatic. Consequently, we sought to study the incidence of PDD after ISB by performing pulmonary function testing on patients before and after operation. The aim was to observe the incidence of prolonged phrenic nerve dysfunction manifested by a decrease in FVC of more than 20% from the preoperative value.

After IRB approval, 98 patients undergoing ISB for shoulder arthroscopy were enrolled (31 paraesthesia technique, 57 nerve stimulator technique, and 10 via ultrasound). FVC and negative inspiratory force were recorded and measured in the sitting position before surgery, in the recovery room, and at post-surgical follow-up (7–14 days). Each measurement was repeated for confirmation.

Two patients had PDD at the time of post-surgical follow up as per our definition (a decrease in FVC by 20%). One was asymptomatic (paraesthesia technique) and refused further work-up. The other (nerve stimulator technique) had shortness of breath with persistent symptoms at 5 weeks after operation with elevated hemidiaphragm ipsilateral to the surgical site on chest radiograph. Diaphragmatic stimulation was noted during needle insertion. Of the 57 patients with nerve stimulator technique, 17% had diaphragmatic stimulation as well, but without sequelae. This may be indicative of the proximity of the phrenic nerve to the path travelled by the needle.

The incidence of definite PDD post-ISB and shoulder surgery in this prospective observational study was 1% (95% confidence interval 0.05–5.03). The exact mechanism is unclear, and may be attributed to different causes. The incidence