RESPIRATORY MUSCLE ACTIVITY AFTER NEOSTIGMINE-OR SUGAMMADEX-ENHANCED RECOVERY OF NEUROMUSCULAR BLOCKADE

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Introduction

- The use of neuromuscular blocking agents (NMBAs), different reversal agents and their effect on respiratory outcome after surgery is still the subject of research and debate
- Some studies have suggested that sugammadex may have a positive impact on respiratory outcome, compared to neostigmine
- As part of a larger trial, we wanted to assess whether reversal of a moderate level of neuromuscular blockade (NMB) with sugammadex resulted in better inspiratory muscle activity

Methods

- We used a transcutaneous electromyography (EMG) method to evaluate both diaphragm (EMGdi) and intercostal (EMGic) muscle activity in a prospective, double-blind randomized controlled trial in patients receiving propofol-remifentanyl anaesthesia
- EMG activity was measured after train-of-four (TOF) returned to >90%, in the interval between the onset of spontaneous breathing and extubation of the trachea. Figure 1 shows the study flowchart
- EMG amplitude peaks on inspiration were used (Fig 2)

Fig 1. Study flowchart

Fig. 2 EMG activity of the intercostal muscles and the diaphragm

Results

- 23 patients were analyzed
- Median EMGdi values were similar for both groups ($P=0.64$): after sugammadex-enhanced recovery median EMGdi 2.9 μV (IQR 1.3 - 5.3) versus after neostigmine enhanced recovery: 3.2 μV (IQR 0.9 - 7.3)
- Intercostal peak EMG amplitudes were different for the two groups ($P=0.009$): after sugammadex-enhanced recovery median EMGic 2.2 μV (IQR 1.3 - 4.5) versus after neostigmine-enhanced recovery: EMGic 1.5 μV (IQR 1.1 - 2.5)
- The use of sugammadex after intermediate level NMB resulted in similar diaphragm EMG activity, but in almost double the intercostal EMG activity compared to neostigmine

Conclusion

In this study, the use of sugammadex after intermediate level of NMB resulted in similar activity of diaphragm, but in almost double the activity of the intercostal muscles, and thus an increased total inspiratory muscles activity. More studies are needed to evaluate the effect of sugammadex and neostigmine on respiratory muscle activity.