Comparison of Neostigmine and Sugammadex Following Desflurane and Total Intravenous Anesthesia in the Elderly

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Background and Goal of Study: The aim of this study is to compare the effects of neostigmine and sugammadex on recovery from anesthesia and reversal of neuromuscular blockage following desflurane and TIVA anesthesia applied to patients older than 65 years of age.

Material and Methods: Eighty ASA I-II patients older than 65 years of age, undergoing elective surgery with general anesthesia, with predicted surgery duration not exceeding 150 minutes, were included in this study. Patients were randomly divided into four groups. The first group was named with TIVA+sugammadex group (Group I), the second was TIVA+neostigmine group (Group II), the third was desflurane+sugammadex group (Group III) and the fourth was desfluran+neostigmine group (Group IV). Anesthesia maintenance was provided with total intravenous anesthesia (TIVA) in group I and II, and desflurane in group III and IV. Neuromuscular monitorisation was provided with acceleromyography displaying train-of-four (TOF) count. Reversal of neuromuscular blockage was achieved with sugammadex (2mg/kg) in group I and III, and neostigmine in group II and IV at the reappearance of T2. All patients are also monitored with bispectral index (BIS). The concentrations of anesthetic agents were adjusted to be

BIS value between 40-60. At the end of the surgery, duration of TOF ratio from 2 to 90, spontaneous respiration time, extubation time, duration of modified alderete score (MAS) ≥ 9 was recorded for all patients. BIS values after the extubation were also recorded.

Results: The time of T2 to T90 was obviously short in groups using sugammadex, regardless of the type of anesthesia. There was no difference between the groups at the time of return of spontaneous respiration and also extubation time except for between the TIVA+neostigmine and desflurane+neostigmine groups. In TIVA groups, the time to evaluate the MAS ≥ 9 was found to be shorter than the other groups. Similarly, BIS values were higher at the spontaneous respiration and after extubation in TIVA groups.

Conclusion: It is concluded that the time to reverse neuromuscular blockade with 2mg/kg sugammadex was significantly faster than neostigmine when they were used for decurarisation after general anesthesia with desflurane or TIVA in elderly, independent of the type of anesthesia. Additionally, postanesthetic recovery was more rapid in TIVA anesthesia compared with desflurane regardless of the type of recurarisation.

Groups	TOF ≥ 0.9 (sec)		BIS spontaneous respiration		BIS extubation		Modified Aldrete Score ≥ 9 (sec)	
	sec $\pm$ SD	p	Mean $\pm$ SD	p	Mean $\pm$ SD	p	sec $\pm$ SD	p
TIVA sug-TIVA neos	162.50 $\pm$ 70.91	0.001	70.40 $\pm$ 9.53	0.603	81.75 $\pm$ 8.92	0.844	457.40 $\pm$ 205.73	0.869
	479.80 $\pm$ 180.15		71.80 $\pm$ 7.20		82.25 $\pm$ 6.91		468.05 $\pm$ 200.69	
TIVA sug-DES sug	162.50 $\pm$ 70.91	0.754	70.40 $\pm$ 9.53	0.001	81.75 $\pm$ 8.93	0.001	457.40 $\pm$ 205.73	0.032
	153.256 $\pm$ 105.26		59.40 $\pm$ 9.15		68.75 $\pm$ 11.42		637.95 $\pm$ 298.05	
TIVA sug-DES neos	162.50 $\pm$ 70.91	0.001	70.40 $\pm$ 9.53	0.003	81.75 $\pm$ 8.93	0.005	457.40 $\pm$ 205.73	0.001
	617.50 $\pm$ 458.18		58.65 $\pm$ 13.38		70.95 $\pm$ 13.70		756.00 $\pm$ 274.79	
TIVA neos-DES sug	479.80 $\pm$ 180.15	0.001	71.80 $\pm$ 7.20	0.001	82.25 $\pm$ 6.91	0.001	468.05 $\pm$ 200.69	0.041
	153.26 $\pm$ 105.26		59.40 $\pm$ 9.15		68.75 $\pm$ 11.42		637.95 $\pm$ 298.05	
TIVA neos-DES neos	479.80 $\pm$ 180.15	0.219	71.80 $\pm$ 7.20	0.001	82.25 $\pm$ 6.91	0.002	468.05 $\pm$ 200.69	0.001
	617.50 $\pm$ 458.18		58.65 $\pm$ 13.38		70.95 $\pm$ 13.70		756.00 $\pm$ 274.79	
DES sug-DES neos	153.26 $\pm$ 105.26	0.001	59.40 $\pm$ 9.15	0.837	68.75 $\pm$ 11.42	0.585	637.95 $\pm$ 298.05	0.201
	617.50 $\pm$ 458.18		58.65 $\pm$ 13.38		70.95 $\pm$ 13.70		756.00 $\pm$ 274.79	

References
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