Effect of sugammadex on the recovery profiles of cardiac patients undergoing non-cardiac surgery

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To the Editor: The global trend of an aging population and an epidemic of coronary heart diseases (CHDs) have led to an increasing volume of non-cardiac surgeries in patients with CHDs.1,2 Drastic fluctuation of hemodynamic parameters can be life-threatening for CHD patients with little tolerance to the increased cardiac load and decreased oxygen delivery.3 Residual paralysis of muscle relaxation after general anesthesia may lead to hypoxemia with respiratory muscle weakness and aggravate the patient’s tension. The cholinesterase inhibitor neostigmine is routinely used to reverse the neuromuscular blockade (NMB) after surgeries under general anesthesia. However, the combined use of neostigmine and atropine in patients with CHD may be potentially problematic because of side effects, such as myocardial ischemia, cardiac arrhythmia, or atroventricular block.4 Sugammadex is a new NMB reversal that is selective for steroidal muscle relaxants, particularly rocuronium. However, the effect of sugammadex on the recovery profiles of CHD patients has not been fully elucidated.

This retrospective observational study was performed at the First Affiliated Hospital of Nanjing Medical University with the approval of the Ethics Committee (No. 2019-SR-244). Two anesthetists were responsible for collecting and analyzing the patient’s data from the clinical anesthesia information system (Beijing Easymonitor Technology Co., Ltd., Beijing, China).

We reviewed CHD patients undergoing general surgery, orthopedic surgery, thoracic surgery, or urinary surgery from June 2017 to December 2019. These patients were treated with percutaneous coronary intervention at least 3 months before surgery. Patients with neuromuscular diseases or other organ dysfunctions (central nervous system, lung, liver, and kidney diseases) were excluded. In this study, 100 patients who received sugammadex (group S) were identified, and 100 CHD patients who received no NMB reversals (group N) were matched by surgery type. About 200 mg dose of sugammadex was administered in group S when the Train-of-Four Stimulation (TOF) count was ≥2 after surgery, while patients in group N received no NMB reversals after surgery. The tracheal tube was removed at a TOF ratio >0.9. Our results demonstrated that the average time to remove the endotracheal tube in group S was significantly reduced (2.3 ± 1.1 vs. 32.4 ± 11.5 min; P < 0.001). The systolic blood pressure (BP) showed no significant difference in group S before and 0, 5, and 10 min after extubation. However, an increase of 17 mmHg in systolic BP was observed immediately after extubation in group N compared with the baseline (150 ± 24 vs. 133 ± 18 mmHg; P < 0.001). Additionally, the systolic BP in group N at 5 and 10 min after extubation was consistently above 150 mmHg. Furthermore, a significant increase in the diastolic BP and mean BP was observed after extubation in group N. The heart rate in group N also showed a statistically significant increase at 0, 5, and 10 min after extubation [Figure 1]. The post-anesthesia care unit stay time (43.5 ± 18.2 vs. 74.8 ± 21.2 min; P < 0.001), incidence of hypoxemia (7% vs. 24%; P < 0.001), and arrhythmias (3% vs. 12%; P < 0.001) in group S were significantly reduced.

A previous study showed that a >20 mmHg increase in the systolic BP or a 10 mmHg increase in the diastolic BP is associated with a two-fold increase in the incidence of cardiovascular complications.5 Our findings suggest that sugammadex reverses NMB rapidly and effectively in CHD patients undergoing non-cardiac surgery. It can shorten the stimulation of tracheal catheters and attenuate hemodynamic fluctuations during extubation. This effect may be one of the important reasons for the reduced incidence of post-operative complications.

Bing Li and Ling Zhou contributed equally to this work.

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Received: 20-08-2020 Edited by: Ning-Ning Wang
Funding

This study was supported by grants from the Wu Jieping Medical Foundation (No. 320.6750.18180) and the Jiangsu Province Special Program for Young Medical Talent (No. QNRC2016587).

Conflicts of interest

None.

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How to cite this article: Li B, Zhou L, Huang H. Effect of sugammadex on the recovery profiles of cardiac patients undergoing non-cardiac surgery. Chin Med J 2021;134:2391–2392. doi: 10.1097/CM9.0000000000001599