

## **Evaluation of Neuromuscular Blockade Reversal on Postoperative Outcomes in Cardiovascular Surgery**

Ranran "Christina" Xia, PharmD

Divina Tuazon, MD

Nandita Kachru, PhD, MS, BPharm

Fariyeh Bostan, PharmD

Amaris Fuentes, PharmD, BCPS, BCCCP

### Background:

Residual neuromuscular blockade can be associated with respiratory complications, prolonged intensive care unit stays, skeletal muscle weakness, and poor recovery. Neostigmine is a reversal agent used to eliminate residual blockade, however, conflicting data exists on its association with respiratory complications, postoperative nausea/vomiting, and cardiac effects.

### Methods:

A single center, retrospective chart review was conducted from January 2015 to April 2016. The study included adult patients who received a cardiovascular procedure and a non-depolarizing neuromuscular blocking agent. The primary endpoint was the duration of postoperative mechanical ventilation- defined as the time from end of procedure to time of initial extubation. Pre-specified secondary outcomes included incidence of postoperative atelectasis, incidence of postoperative pneumonia, need for non-invasive positive pressure ventilation after extubation, need for reintubation during hospital stay, discharge disposition, PaO<sub>2</sub>/FiO<sub>2</sub> ratio, total antiemetic doses used up to postoperative day three, hospital length of stay, ICU length of stay, and readmission to ICU during hospitalization.

### Results:

Study cohort included in the analysis consisted of 175 patients (neostigmine users n=95; non-users n=80). A difference in duration of mechanical ventilation was noted among neostigmine user and non-user groups (5.23 [IQR 3.93 to 9.33] vs 7.36 [IQR 5.18 to 23], p=0.03). In addition, more neostigmine users met the early extubation benchmark of less than six hours compared to non-users (55 vs. 34 patients, p=0.04). Controlling for all covariates, neostigmine was associated with a 34% (20.4 minute; p=0.007, 95% CI 0.49 to 0.89) reduction in duration of mechanical ventilation. No significant differences were found in regards to secondary endpoints.

### Conclusions:

Neostigmine use decreased the duration of post-operative mechanical ventilation in cardiovascular surgery patients. More neostigmine users also met The Society of Thoracic Surgeons' early extubation benchmark less than 6 hours. Neostigmine use was also not found to be associated with increased risk of respiratory complications, postoperative nausea/vomiting, and did not impact length of stay.