Introduction:
Mechanical insufflation-exsufflation (MI-E) possibly improves cough efficacy but there are limited data in terms of cough assist techniques, modes of device, safety and efficacy of MI-E in critically ill patients. So we want to compare cough efficacy (secretion clearance) and cough strength (maximum expiratory pressure; MEP), and safety between implementation of volume mode and pressure mode of MI-E in postextubated patients.

Methods:
We conducted a prospective crossover study. The postextubated patients with history of MV for ≥24 hours were enrolled. We excluded patients with severe COPD, lung bleb, pneumothorax, hemoptysis, recent history of thoracoabdominal surgery, increased intracranial pressure, impaired consciousness and pregnancy. The patients were randomized into 2 groups. The patients received cough assistance with either volume mode (group A) or pressure mode of MI-E (group B) of MI-E during the first period. The sputum volume, respiratory and hemodynamic parameters, and adverse events were recorded. One day after the first period, the patients received cough assistance with the other mode during the second period. The primary outcome was the amount of secretion after MI-E implementation and the secondary outcomes were MEP changes and adverse events.

Results:
Totally, 25 patients were enrolled. The majority of them were female, medical ICU patients with the mean age of 64 years. The amount of secretion after MI-E implementation was not significantly different between both modes. In addition, MEP, respiratory events and hemodynamic instability were also not significantly different between both modes. Remarkably, regardless of modes of MI-E, MEP tended to increase after multiple sessions of MI-E. Two patients were reintubated due to volume overload and vocal cord edema.

Conclusion:
In postextubated patients, cough efficacy after MI-E implementation was not different between volume and pressure modes. Additionally, MI-E was safe and tended to improve cough strength after extubation.

References: