A case-control study on predictors & outcomes of unplanned extubation in mechanically ventilated critically ill patients

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Objective

• To find out predictors & outcomes of unplanned extubation in mechanically ventilated critically ill patients.
Conceptual framework of the study based on SEIPS model (Carayon et al. 2006)
Design

• A case-control study over 3 years period from January 1, 2010 through December 31, 2012.
Critical care unit-SNUH

1821 total hospital beds, 154 ICU Beds
Staffing in ICU

Nurse Unit manager
Charge Nurse
Nurse

Nurse to patient ratio = 1:2
Settings

• A 62-beds medical & surgical intensive care unit of 1800 beds tertiary hospital
Patients

• Data were retrospectively collected from electronic medical records.
• A total 230 episodes of deliberate unplanned extubation in 242 patients from 41,207 mechanically ventilated patients for 3 years (frequency 0.53%).
• 460 episodes in 460 patients with planned extubation age, gender & diagnosis-matched controls were analyzed in this case-control study.
Measurements & Main Results

To identify the factors contributing to and the outcomes of unplanned extubation, characteristics were compared between unplanned extubation group & planned extubation group.
• The 2 groups differ significantly in variables associated with unplanned extubation.
• Multiple logistic regression analysis was performed to determine the variables independently associated with unplanned extubation.
Main Results

Predictors associated with unplanned extubation include
• Better motor response (OR 1.3),
• Admission route via ER (OR 1.8),
• Higher APACHE II score (1.061),
• Mode of mechanical ventilation (CPAP, PSV: OR 4.1, SIMV: 3.0),
• Peripheral O₂ saturation (OR: 0.9), heart rate (OR: 1.0), respiration rate (OR: 1.0)
Main Results

- Pain (OR: 0.3),
- Agitation (OR: 9.0),
- Delirium (OR: 11.6),
- Night shift (OR: 6.0)
- Morning care time (OR: 0.5).
Main Results

The patients’ & organizational outcomes of unplanned extubation were

• Reintubation (OR; 85.66)
• Poor discharge result (OR: 0.2)
• Longer length of stay in the ICU (adj R-square: 7%) and a longer length of stay in the hospital (adj R-square: 4.3%).
Conclusions

• **Delirium, agitation, ventilation mode and night shift** are high predictive factors of unplanned extubation.

• The outcomes of unplanned extubation were increasing **reintubation**, a **poor patient outcome** at the time of discharge and **poor organizational outcome** including **longer length of stay in the ICU and hospital**.
Prevention of Unplanned extubation in ICU
References

Thank you!