Early tracheostomy in the intensive care unit: Systematic review and meta-analysis

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Introduction
Critical care patients sometimes have difficulty being weaned from the ventilator, and mechanical ventilation/intubation is associated with a host of complications. Recent studies suggest that transition to tracheostomy within 10 days may have better outcomes than longer-term intubation. The purpose of this study was to perform a systematic review and meta-analysis of the recent literature on outcomes for early tracheostomy.

PICO Question
Population: Adult ICU patients who require ventilatory support.
Intervention: Early (≤10 days) versus late tracheostomy (>10 days) in mechanically ventilated patients.
Comparison: Outcomes of patients trached early versus late.
Outcomes: Mortality, ventilator-acquired pneumonia (VAP), and pneumonia.
Question: Is early tracheostomy associated with lower rates of mortality, VAP, and pneumonia in adult critical care patients requiring mechanical ventilation relative to late tracheostomy?

Methods
- A literature search was conducted using the Medline database.
- Key words included “early tracheostomy” and “intubation.”
- This search yielded 14 articles published between January 1, 2012 and September 24, 2013.
- There were six articles that could be combined for mortality, two articles for VAP, and two articles for pneumonia.
- Risk ratios for the outcomes across studies were pooled using the Mantel-Haenzel fixed effects model.

Results
- Across six studies that reported mortality, patients undergoing early tracheostomy had significantly lower risk of in-hospital mortality (RR=0.86, p=0.038).
- Across two studies that reported VAP, when combined, early tracheostomy had lower risk of VAP, but the effect was not statistically significant (RR=0.92, p=0.64).
- Combining two studies that reported pneumonia, early tracheostomy was associated with a significantly lower rate of pneumonia (RR=0.61, p=0.014).

Discussion
- Early tracheostomy appears to be associated with significantly lower rates of mortality and pneumonia.
- Although the effect for VAP was not statistically significant, the lack of significance may be due to low power.

Future actions and studies:
- Research 3-4 days for early tracheostomies instead of ≤10 days.
- Perform a larger prospective randomized trial in a multicenter study.
- Incorporate a field for intubation date in PowerChart with alerts when intubation has exceeded a specified time.
- More effective patient and family education.

Conclusions
Early tracheostomy reduces rates of mortality and pneumonia. Patients in the ICU who are intubated should be evaluated for tracheostomy within 10 days.

References