

Is Early tracheostomy on patient mortality and ICU length of stay overrated? Qualitative Narrative Review of Randomized Controlled Trials

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BACKGROUND

- Prolonged intubation is 14-21+ days of mechanical ventilation (MV) and is associated with poor outcomes.[1,2,3]
- Tracheostomy provides long term airway access and is associated with benefits on mortality and ICU length of stay.

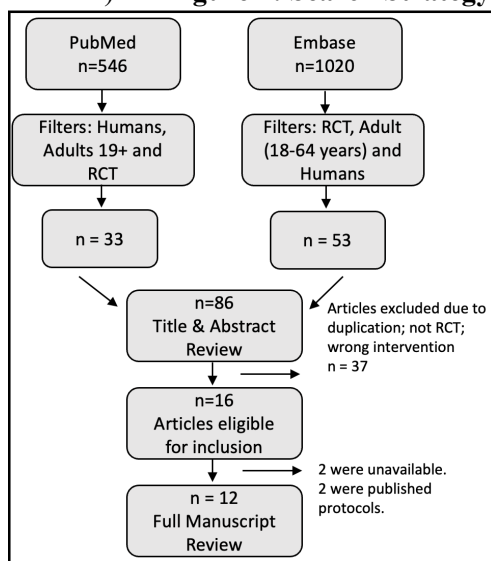
HYPOTHESIS

- Early Tracheostomy compared to late tracheostomy, improves mortality in intensive care unit (ICU) patients.

METHODS

- PubMed and Embase database were searched for randomized controlled trials (RCT) on Early vs Late tracheotomy (ET vs LT) according to 2009 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

Figure 1: Search Strategy:



There is profound heterogeneity in timing of 'early' and 'late' tracheostomy; the effect on patient mortality is overrated in high-resource countries

Table 1. Early vs Late Tracheostomy (ET vs LT) by Author and Year

Author Year	ET	LT
Gessler,2015	If on days 1-7	Days 8-20
Rumbak,2004	≤ 2 days	Days 14-16
Bosel,2013	≤3 days	Days 7-14
Young,2013	≤ 4days	≥ 10days
Koch,2012	≤4 days	≥ 6days
Schonenberger,2016	≤ 5 days.	≥ 10days.
Cipulli,2019	≤ 7 days	>7 days
Barquist,2006	<8 days	> 28 days
Diaz-Prieto,2014	If < 8 days	On day 14
Mohamed,2014	<10 days	>10 days
Sugerman,1997	≤ 3-5 days	Days 10-14
Terragni,2010	After 6-8 days	≥ 13-15 days
Saffle,2002	Post-burn day 4	≥ 14 days

Table 2. Effect of Timing of Tracheostomy on Mortality by Study author and Year

Bosel 2013	ICU mortality was higher in the standard group compared to the early tracheostomy group 14 (47%) vs 3 (10%) deaths in each respective group. At 6 months, mortality was also higher in the standard group compared to the ET group, 18 vs 8 deaths respectively.
Rumbak 2004	In the ET group, 19 of 60 (31.6%) died. In the LT group 37 of 60 (61.7%). ET had 50% less mortality vs delayed group (p<0.005).
Young 2013	No significant difference in all-cause mortality at 30 days in ET vs LT groups (30.8% vs 31.5% respectively). Median Survival, in days, for the subset of patients who died in the ICU were not statistically significant (9.3 days vs 10.4 days, ET vs LT respectively).

RESULTS:

- Limited consistency in defining early and late tracheostomy.
- Two studies with positive effect on mortality. [5,6]
- 11 of the 12 studies were in countries with Human Development Index (HDI) in the top 40 (Lowest rank possible is 189)

DISCUSSION

- ET is defined within the boundaries of LT of other studies and there is limited consensus on definition.
- Pneumonia in the LT group was the leading cause of death in Rumbak[6] although this is confounded by daily replacement of the inner cannula on tracheostomy tube. Bosel only cautiously reports a benefit given their small sample size.[5]

LIMITATIONS:

- Approach to article screening and lack of statistical analyses.

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CONFLICT OF INTEREST

- No conflicts of interest to report.

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