INTRODUCTION

• Patients with acute traumatic spinal cord injury (SCI) at the cervical or high thoracic level typically experience severe respiratory complications and need intubation and mechanical ventilation (MV).
• Tracheostomy is typically preferred when prolonged weaning or chronic MV is predicted.
• Tracheostomy may:
  • Facilitate weaning by reducing airway resistance
  • Prevent complications from prolonged translaryngeal intubation including ulceration, granulation tissue formation, subglottic edema, and laryngeal or upper tracheal stenosis
  • Lead to improvements in comfort, swallowing, early phonation, and ease of access for tracheal suctioning
• However, it is an invasive procedure with risks, including bleeding, infection, tracheal ring fracture, posterior tracheal wall injury, pneumothorax, trachea-innominate fistula and death
• For patients with acute traumatic SCI, there is no consensus on the most appropriate time to perform a tracheostomy

AIM

• The aims of this systematic review are to evaluate and synthesize evidence regarding the timing of tracheostomy in acute traumatic SCI patients
• Primary question: Does early (≤7 days) compared to late tracheostomy (>7 days) or prolonged intubation reduce short-term mortality?
• Secondary outcomes:
  • Long-term mortality
  • Duration of mechanical ventilation
  • Length of ICU/hospital stay
  • Ventilator-associated pneumonia
  • Tracheostomy and ICU-associated complications
  • Quality-of-life measures
  • Duration of sedation, time to phonation and swallowing

METHODS

• Studies were identified through a search of the following databases from inception to December 2019: MEDLINE, EMBASE, CINAHL, Scopus, Web of Science, CENTRAL and DARE, Google Scholar, reference lists of the retrieved articles
• Studies were screened using the study title (and abstracts when in need of clarification)
• Full texts of the remaining articles were then examined using a set of defined inclusion and exclusion criteria
• Inclusions: ICU patients with acute traumatic SCI at the cervical or high thoracic level (irrespective of age, severity, co-morbidities, or mechanism of injury) requiring MV
• Exclusions: ICU patients with acute SCI not mechanically ventilated, ICU patients with acute brain injury (without SCI), case reports
• As per best practice guidelines, the systematic review protocol was registered with PROSPERO and adheres to PRISMA guidelines for reporting of reviews

RESULTS

• Thirty studies (6,684 patients) met selection criteria, 21 of which were published in the last decade
• Majority of studies were single centre retrospective cohort studies
• Mean time for early tracheostomy was 5.8 days across eleven studies, and late tracheostomy was performed after 14 days
• The remaining studies provided ranges for early and late tracheostomy, most frequently ≤7 days and >7 days, respectively

Outcomes

• Early tracheostomy is not associated with reduced short-term mortality
• Short-term mortality (includes ICU and hospital mortality)

Future research should seek to understand whether early tracheostomy improves patient comfort, decreases duration of sedation, and improves long-term outcomes.