NSW Speech Pathology Evidence Based Practice Network

Critically Appraised Paper (CAP): External Published DIAGNOSTIC Evidence

CLINICAL BOTTOM LINE:

In a large cohort of critically ill patients who survived mechanical ventilation, it was found that a longer duration of mechanical ventilation is independently associated with post- extubation dysphagia, and post-extubation dysphagia is independently associated with poorer patient outcomes, including pneumonia, reintubation and death.

Further research into this disorder is needed to identify its epidemiology and pathophysiology as well as to develop diagnostic strategies and treatments.

Clinical Question

'What is the incidence and what are the predictors for oropharyngeal dysphagia in extubated patients?'

Citation:

Macht, M., Wimbish, T., Clark, B.J., Benson, A.B., Burnham, E.L., Williams. A., & Moss, M. *Postextubation dysphagia is persistent and associated with poor outcomes in survivors of critical illness*. Journal of Critical Care. 2011. 15:R231.

Method:

- Retrospective, observational, cohort study.
- Hospital, Speech Pathology and Respiratory databases were accessed to obtain data.
- Aim of the study was to identify specific risk factors associated with dysphagia in patients with acute respiratory failure (ARF) and requiring mechanical ventilation (MV).
- The primary independent variable of interest was the duration of mechanical ventilation; secondary variables of interest included reintubation, endotracheal tube size and severity of illness (measured using the Sequential Organ Failure Assessment, calculated at the time of admission to the ICU).
- The primary outcome variable was the presence of a swallowing dysfunction as determined by a Speech Pathologist following BSE, and assignment of a Dysphagia Outcome Severity Scale (DOSS) score.
- Some patients (N= 11) underwent VFSS (as determined by the treating SP or physician). For these patients, the VFSS DOSS score was used to determine severity.
- SAS version 9.1 software was used for all analyses, and $P < 0.05$ was considered statistically significant.
- Univariate and multivariate analyses were used. Backward logistic regression models were used to determine the effect of the duration of MV on the presence of dysphagia, and the effect of dysphagia on patient outcomes.
- The authors prespecified that separate multivariate analyses would be performed for patients with or without a tracheostomy.

Participants:

Inclusion criteria:

- All patients over 17 years of age admitted to a University Hospital ICU (between 2008-2010) who required mechanical ventilation and received a bedside swallow evaluation (BSE) post- extubation only (N= 630).
- Patients who received short- duration mechanical ventilation (< 48 hrs) were included.

Exclusion criteria:

- Study sample size (N= 446) excluded patients presenting with neuromuscular disease or CVA (N= 184).
- Patients who received their first BSE prior to mechanical ventilation.

Results:

- Some degree of dysphagia was present in 84% of patients assessed by BSE, in 18% of the total population of ARF survivors and in 15 % of all patients admitted to the ICU during the study period.
- Among the 446 patients included in the study, dysphagia severity was mild in 44%, moderate in 23% and severe in 17%.
- Univariate analysis indicated statistically significant risk factors for severe dysphagia included longer duration of mechanical ventilation (> seven days), reintubation, tracheostomy and male gender.
- Multivariate analysis of patients without a tracheostomy (after adjusting for age, gender, and severity of illness) indicated that mechanical ventilation for more than seven days remained independently associated with moderate or severe dysphagia.
- In the analysis of patients with tracheostomy, mechanical ventilation for more than seven days was not independently associated with moderate or severe dysphagia.
- Of the 243 patients whose dysphagia resolved while they were in hospital, the median duration of dysphagia was three days for those with mild dysphagia (N= 162) and 6 days for those with moderate- severe dysphagia (N= 81). At the time of hospital discharge, dysphagia was present in more patients with moderate or severe dysphagia, compared to those with mild dysphagia.
- Univariate analysis was performed to evaluate the associations between the presence and severity of dysphagia and hospital outcomes. The presence of dysphagia was statistically associated with hospital days after initial BSE, discharge status, no oral intake status, surgical placement of a feeding tube and composite outcome of pneumonia, reintubation and in- hospital mortality.

Strength of the evidence

(1) Level of evidence (NHMRC, 2009): I II III-1 III-2 III-3 IV

Comments:

- It was found that postextubation dysphagia persists at the time of discharge in a large portion of patients (29%) and is associated with poorer patient outcomes.
- Specifically, moderate or severe dysphagia is associated with an increased risk of reintubation, development of pneumonia, longer hospital stay, reduced dietary intake, placement of feeding tubes, discharge to a nursing home and increased risk of death.
- The exact frequency of postextubation dysphagia among all medical and surgical ICU patients remains unknown.
- The primary limitations on understanding this frequency are: 1. the absence of a widely accepted diagnostic standard for dysphagia, and 2. the relatively small populations represented in the existing studies.
- Further studies are needed to explore the diagnosis, causes & complications of postextubation dysphagia.

Strengths/ weaknesses of study:

- Over two thirds of the patients admitted to ICU during the study period who met the inclusion criteria (N= 2484) did not undergo an evaluation for dysphagia, and thus the true incidence of dysphagia among the patients in this study is uncertain.
- Inherent in the design of a single- centre, retrospective, observational cohort study is an ability to draw conclusions about causation.
- Data on the presence of pre- existing swallow dysfunction was not known, and therefore these patients were not able to be excluded from analysis. Potentially, this could have resulted in a falsely increased number of patients as having postextubation dysphagia.
- The lack of a firm diagnostic test to determine the presence or absence of dysphagia. Although the DOSS is validated for instrumental assessment (VFSS), for BSE the reliability is based on the judgement of the treating Speech Pathologist, which is inherently subjective. FEES is likely a more sensitive measure of aspiration, compared to BSE or VFSS in these patients.
- This study is one of the larger, and one of the first to show that long duration of MV is associated with the development of postextubation dysphagia.

Appraised By:
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