Post-extubation Dysphagia

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Disclosure Statement
Overview

• Intubation complications
• Research
  – Review of 3 post-extubation articles
• Brief case study
• Summary / clinical implications
• Q and A
Learning Objectives

1) Describe structural and mechanical alterations due to intubation
2) Define risk factors associated with post-extubation dysphagia
3) Describe the research findings regarding post-extubation dysphagia
Why this topic?

• SLPs asked to conduct swallowing evaluations on post-extubation patients on a daily basis
  – Medical ICU
  – Surgical ICU
  – Cardiovascular ICU
  – Geriatric unit
  – Burn unit
  – Trauma ICU
  – Neuro ICU
Why this topic?

• Anecdotally, we know that there is a high incidence of dysphagia following intubation....but
  – What are the risk factors?
  – Who should we assess?
  – How should we assess?
  – When should we assess?
Why this topic?

• Need to know what the research is telling us so we can provide evidence-based practice in this patient population
• Need to be able to advocate for our patients
• Need to be able to educate other professionals about the need for swallowing evaluations in this patient population
Evidence Based Practice

• It is the position of the American Speech-Language-Hearing Association that audiologists and speech-language pathologists incorporate the principles of evidence-based practice in clinical decision making to provide high quality clinical care.
Evidence Based Practice

- The term evidence-based practice refers to an approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values into the process of making clinical decisions.
FEES images

• Quick review

Abducted VF
Adducted VF
Abducted VF
Adducted VF
Intubation

- The placement of an endotracheal tube into the trachea to provide a means of mechanical ventilation.
Endotracheal tube
Dysphagia and dysphonia are the most frequent clinical symptoms following intubation (Camargo, et.al, 2003)
 Structural and Mechanical Alterations Following Intubation

• Oro-pharyngeal atrophy
• Reduced laryngeal elevation
• Alterations of the mechanoreceptors and chemoreceptors of the pharyngeal and laryngeal mucosa
• Laryngeal atrophy
• Reduced VF closure / VF immobility
Structural and Mechanical Alterations Following Intubation

• Laryngeal trauma / pathologies
  – epithelial/mucosal abrasions and ulcerations
  – Edema and erythema
  – tracheoesophageal fistula formation
  – tracheal stenosis / tracheomalacia
  – granulation tissue
  – Hematomas on vocal folds
Swallowing Impairments

  - 21 patients who presented with clinical signs of aspiration after long-term intubation underwent videofluoroscopy
  - 18 patients (86%) with aspiration.
  - Found functional abnormalities of the tongue in 48%, of the soft palate in 10%, of the epiglottis in 48%, of the pharynx in 71%, and of the upper esophageal sphincter in 24%
Articles

• Article 1

• Article 2

• Article 3
Article 1
Routine fiberoptic endoscopic evaluation of swallowing following prolonged intubation: implications for management

• What they did
  – FEES was conducted on 48 surgical and medical ICU patients who required a minimum of 48 hours of intubation
  – FEES conducted within 48 hours of extubation
  – Patients were excluded if they had pre-existing dysphagia
Article 1

• What they found:
  – Overall incidence of aspiration was 56%
  – 12 of the 48 (25%) were silent aspirators

In a study by Leder et al., 1998 FEES demonstrated swallowing dysfunction in 45% of critically ill trauma patients after prolonged intubation, with 20% having silent aspiration.
Article 1

• What they found
  – 70% of the patients aspirated with thin liquids
  – 30% of the patients aspirated with puree
  – No significant difference in length of intubation demographics, clinical variables or comorbidities (presence of NG tube, h/o COPD, DM or GERD)
Clinical Implications

- Is FEES a reliable tool for the post-extubation patient?
  - “Both overt and silent aspiration are reliably and clearly identified with endoscopic images, which may serve as a baseline for subsequent evaluations in the post-extubation period”

- How could these results impact practice?
  - “Since no clinical factors were associated with an increased risk of swallowing dysfunction, we currently use bedside FEES to evaluate the swallowing function of all patients requiring prolonged intubation. The results of the FEES are used to make initial and subsequent dietary recommendations that may decrease the likelihood of aspiration”
Swallowing disorders post orotracheal intubation in the elderly

• What they did
  – FEES was used to assess swallowing post extubation in an MICU within a 500 bed hospital
  – Assessed 42 consecutive patients 65 years of age and older (elderly group) who were intubated for 2 or more days
  – Assessed 42 consecutive patients <65 years of age (control group) who were intubated for 2 or more days
  – Excluded: VF dysfunction, prior trach, oropharyngeal malignancy, CVA, Parkinson's or neuromuscular disease
  – Groups were comparable in terms of days of intubation, duration of NG tube placement and APACHE II scores
Apache II

• Acute Physiology and Chronic Health Evaluation II
  – is a severity-of-disease classification system. It is applied within 24 hours of admission of a patient to an ICU: a score from 0 to 71 is computed based on several measurements; higher scores correspond to more severe disease and a higher risk of death.

• Point score is calculated from 12 routine physiological measurements:
  – Age
  – Temperature (rectal)
  – Mean arterial pressure
  – pH arterial
  – Heart rate
  – Respiratory rate
  – Sodium (serum)
  – Potassium (serum)
  – Creatinine
  – Hematocrit
  – White blood cell count
  – Glasgow Coma Scale
• What they found
  – The prevalence of aspiration determined by FEES was 52% for the elderly and 36% for the control group
  – 36% of elderly aspirators exhibited silent aspiration
  – 20% of control group aspirators exhibited silent aspiration
Article 2

• What they found
  – No difference in the comorbidities or **length of intubation**
  – Of the elderly who aspirated the functional status was significantly impaired compared to those who did not
  – After 2 weeks, the frequency of swallowing dysfunction dropped to 14% in those 65 and older while no swallowing deficit was documented in the control group
Article 2

• Clinical Implications
  – Is a bedside enough or should we be doing instrumental assessments on our post-extubation patients?
    • “The clinically significant incidence of silent aspiration in these investigations underlines the unreliability of subjective bedside evaluations in assessing swallowing deficit”
  – How long does dysphagia last post-extubation?
    • No dysphagia after 2 weeks in the <65 years of age group; higher risk for prolonged swallow impairment for the elderly
• No difference in length of intubation
  – Kwok et al. 2013 identified ventilator days as the strongest independent predictor of dysphagia followed by patient age.
  • Each additional day after the initial 24 hours on mechanical ventilation increased the odds of dysphagia 25%
Are you still with me?

My nauseating boredom is in no way related your PowerPoint presentations.
Article 3
The incidence of dysphagia following endotracheal intubation: a systematic review

• What they did
  – Conducted a systematic review of the literature to determine:
    • Incidence of dysphagia following endotracheal intubation
    • The association b/t dysphagia and intubation time
    • Patient characteristics associated with dysphagia
Article 3

• What they did
  – Searched fourteen electronic databases and journals
  – Found 288 articles to review
  – Stringent exclusion criteria (ie: case series, patients with trachs, esophageal dysphagia, etc)
  – Cochrane risk of bias assessment used
  – Grading of Recommendations, Assessment, Development and Evaluation (GRADE) tool used
  – 14 met inclusion criteria
Article 3

• What they found
  – Dysphagia frequency following endotracheal intubation is variable, ranging from 3% - 62%
  – More than one-half of the studies reported a dysphagia frequency exceeding 20%
  – Highest dysphagia (62%, 56% and 51%) included patients with prolonged intubation (> 24h) across all diagnostic subtypes.
Article 3

• Discussion/ Limitations
  – Heterogeneous population including both medical and surgical diagnoses
  – Patients were evaluated in a wide assortment of swallowing assessment methods (CSE, VFSS, FEES, submental electromyography, chest radiograph following administration of an oral contrast agent)
  – AND….at varying times following extubation (immediately – 5 days; some did not report)
Article 3

• Discussion / Author recommendation

  “given the high likelihood of serious medical complications of dysphagia, particularly pneumonia, we recommend that swallowing assessments should be conducted on patients undergoing prolonged intubation.”
Brief case study (CB)

- 51 yo male; PMH: DM, peripheral neuropathy, HTN, CAD, polysubstance abuse
- Presented to ED with SOB, 02 sats 88% on RA
- CXR showed multifocal pna
- Admitted to MICU; continued to decline despite meds and 02
- Required intubation due to respiratory failure
- Dobhoff feeding tube placed
- Remained intubated for 6 days
- Speech Path received order for swallow eval day 1 post extubation
- Bedside swallow eval revealed s/s of aspiration
- Rec: NPO until instrumental swallow assessment could be completed
- SLP conducted FEES day 2 after extubation
CB FEES results/ recs

• FEES revealed moderate-severe oropharyngeal dysphagia
  – Reduced BOT retraction
  – Reduced pharyngeal contraction
  – Reduced laryngeal elevation
  – Moderate vallecular and pyriform sinus residue
  – Aspiration across consistencies with delayed, weak cough

• Recommendations:
  – ice chips only after good oral hygiene
  – Indirect swallow therapy (exercises)
  – Repeat FEES when deemed appropriate by SLP
Summary

• “Prolonged intubation” is typically considered 48 hours or more
  – though some studies consider 24 hours prolonged intubation

• Many patients experience dysphagia post-extubation
  – muscle atrophy attributable to non-use while intubated
  – loss of proprioception attributable to mucosal lesions

• High risk of silent aspiration following prolonged intubation (25%)
  – therefore a CSE is not a sensitive enough evaluation
  – Need instrumental assessment (FEES vs. VFSS)
Summary

• Patients exhibit a variety of oropharyngeal and laryngeal impairments following intubation

• No difference in swallow function re: length of intubation
  – This may be because prior studies have shown that mucosal inflammation occurs after as little as 24 hours of endotracheal intubation
Summary

- Patients with decreased functional status (determined by pre-admission ADL score) are at greater risk for post-extubation dysphagia
- Elderly patients are at greater risk for post-extubation dysphagia
Did I find the answers to my questions?

– What are the risk factors?
– Who should we assess?
– How should we assess?
– When should we assess?
Questions I still had (have?)

• When to evaluate?
  – Immediately after? 24 hours? 48 hours?
  – A recent non-published study reported:
    • No difference in swallowing ability 24 vs. 48 hours post extubation (Scheel, et. Al 2009)
What we still need

- High quality research using homogeneous patient populations to assess the influence of prolonged intubation on dysphagia and to determine whether select medical comorbidities put patients at greater risk
Take home message

• Instrumental assessments should be strongly considered for ALL patients who were intubated longer than 48 hours
  • Is this realistic?

• Highest risk patients:
  – Elderly (65 years and older)
  – Poor functional status
  – Any surgical or medical diagnosis that would result in increased incidence of swallowing dysfunction
    – Let’s talk about this for a minute.....
  – Pre-existing dysphagia
Thank you!

- Thank you to TAASLP for inviting me to present today
- Thank you to Jacob Feldman, my grad student for helping with my FEES pics and video! 😊
References


References


