Posters – Group 5

Swallowing Physiology and Treatment

Behavioral interventions targeting upper esophageal sphincter opening – a scoping review and appraisal of the current evidence base

AUTHORS (LAST NAME, FIRST NAME): Doeltgen, Sebastian1; Kaur, Harsharan1; Daniels, Stephanie K.2; Murray, Joanne1

Purpose: Impaired upper esophageal sphincter (UES) opening is a key biomechanical feature often observed in dysphagia, which inhibits bolus transfer into the esophagus. The purpose of this scoping review was to systematically explore behavioral interventions that aim to improve UES opening and to appraise the existing evidence base.

Learning Objective:
- Identify behavioral interventions targeting impaired upper esophageal sphincter opening and will be able to interpret the current evidence base in the context of limitations relating to methodological approaches and participant selection.

ARE HYOID BONE KINEMATICS ASSOCIATED WITH SWALLOWING SAFETY?

AUTHORS (LAST NAME, FIRST NAME): Smaoui, Sana1, 2; Peladeau-Pigeon, Melanie2; Steele, Catriona M.2, 1

Purpose: Hyoid bone movement is commonly evaluated in videofluoroscopic swallowing studies (VFSS), yet research remains equivocal regarding links between hyoid movement and swallowing safety. Our goal was to determine the association between hyoid kinematics, swallowing safety as measured by the Penetration-Aspiration Scale (PAS), and parameters measuring laryngeal-vestibule-closure (LVC) timing and integrity.

Learning Objective:
- Discuss the relationships between hyoid kinematics (hyoid XY peak position and speed) and swallowing safety parameters.

Determining the Validity of the Tongueometer in Comparison to the Iowa Oral Performance Instrument

AUTHORS (LAST NAME, FIRST NAME): Mohsin, Nazia1; Guastella, Rebekah3; Oppedisano, Stefania3; Namasivayam-MacDonald, Ashwini M.2

Purpose: Measuring tongue strength supports the objective assessment and treatment of oral motor impairments, such as dysphagia and dysarthria. As new tongue pressure manometers come to market it is important that they are validated against the current gold standard prior to being implemented in research and clinical practice. This study investigates the concurrent validity of a new, relatively inexpensive device to measure tongue strength, the Tongueometer, in comparison to the current gold standard tongue pressure manometer (the Iowa Oral Performance Instrument (IOPI®)).
Learning Objective:
- Explain the validity of a new instrument, the Tongueometer, to measure tongue pressures in comparison to the Iowa Oral Performance Instrument.

Effects of Physiochemical Properties of Food and Liquids on Swallowing Physiology in Adults: A Systematic Review

AUTHORS (LAST NAME, FIRST NAME): Pena, Rodolfo E.1, 2, 3, 8; Schaen-Heacock, Nicole4; Hitchcock, Mary5; Kurosu, Atsuko2, 6; Ciucci, Michelle R.1, 6, 9; Rogus-Pulia, Nicole7, 2, 8

Purpose: Physiochemical properties of food and liquids provide sensory input that can modify swallowing physiology in both healthy adults and patients with dysphagia. The purpose of this systematic review was to understand which specific properties of food and liquids are associated with changes in swallowing physiology in adults with and without dysphagia.

Learning Objective:
- Discuss the physiochemical properties of foods and liquids that modify the swallowing physiology on both healthy adults and patients with dysphagia.

Effects of Varying Transcutaneous Electrical Stimulation Pulse Duration on Hyolaryngeal Kinematics in Healthy Adults

AUTHORS (LAST NAME, FIRST NAME): Barikroo, Ali1

Purpose: Limited research in swallowing physiology has suggested that using submental transcutaneous electrical stimulation (TES) with short pulse duration (PD) (300 μs) may enhance the impact on deep extrinsic tongue muscles, thereby pulling the tongue down during swallowing. However, it was unclear whether the same TES protocol can have a differential impact on hyolaryngeal kinematics. This study aimed to compare the effect of submental TES with varying PDs on anterior and superior hyolaryngeal kinematics at rest and during swallowing in healthy adults.

Learning Objective:
- Describe the physiologic effects of TES with varying pulse durations on superior and anterior hyolaryngeal excursions at rest and during swallowing.

Exercise in patients with amyotrophic lateral sclerosis: An unsuccessful meta-analysis

AUTHORS (LAST NAME, FIRST NAME): Donohue, Cara1; Cazalas, Mary Catherine2; Colquhoun, Ryan J.3; Lacomis, David4; Garand, Kendrea2; Carnaby, Giselle;

Purpose: Amyotrophic lateral sclerosis (ALS) leads to debilitating impairments in mobility, respiratory and bulbar functioning due to upper and lower motor neuron degeneration. Research in animal and human models provides promising evidence that exercise (e.g. aerobic, respiratory muscle strength training [RMST]) may slow disease progression while strenuous exercise may lead to faster deterioration. Exercise in patients with ALS (PALS) remains controversial in clinical and research settings.
due to conflicting research evidence to date. We attempted to perform a meta-analysis to determine effects of exercise in PALS.

Learning Objective:
- Describe the role of exercise in management of patients with ALS.

Implementation and evaluation of a speech language pathology VFSS referring model

AUTHORS (LAST NAME, FIRST NAME): Taubert, Shana T.1, 2; Burns, Clare1, 2; Ward, Elizabeth2, 3; Bassett, Lynell1

Purpose: Speech language pathologists (SLPs) routinely refer patients for videofluoroscopic swallow studies (VFSS) to inform dysphagia intervention. However in many countries, only doctors are authorised to complete medical imaging request forms due to radiation safety legislation. This process of seeking a medical referral can impact workflow and patient access to VFSS. The aim of this study was to evaluate the efficiency and safety of an alternate SLP-led VFSS referring model, compared to medical referring.

Learning Objective:
- Discuss the outcomes of a SLP-referring model for VFSS.

Incomplete Glottic Closure and Post-Swallow Residue are Associated with Aspiration in Cardiovascular Surgical Patients.

AUTHORS (LAST NAME, FIRST NAME): Plowman, Emily K.1, 2; Dallal York, Justine3, 2; Anderson, Amber3, 2; DiBiase, Lauren3, 2; Segalewitz, Tara4, 2; Croft, Kayla4, 2; Jeng, Eric5; Chheda, Neil6

Purpose: We have previously reported a high rate of aspiration in postoperative cardiovascular patients that is associated with increased length of hospital stay, cost of care, pneumonia, reintubation, and death.1 Currently, contributing physiologic mechanisms of unsafe swallowing are not known, limiting the development of targeted interventions. Given this gap in knowledge, we sought to examine contributing physiologic factors of aspiration in postoperative cardiovascular patients.

Learning Objective:
- Identify physiologic factors associated with postoperative aspiration in cardiac surgical patients.

Is there a Recency Effect During Visuoperceptual FEES Analysis?

AUTHORS (LAST NAME, FIRST NAME): Borders, James C.1; Curtis, James A.1; Troche, Michelle S.1

Purpose: Visuoperceptual ratings of the amount of airway invasion on FEES are common practice in research and clinical care. However, it is unknown whether this visuoperceptual analysis is influenced by the severity of prior swallows, and thus if raters are prone to a recency bias. This study aimed to examine whether exposure to a prior swallow (either mild or severe) affected laryngeal vestibule ratings for the next swallow.

Learning Objective:
- Describe the recency effect and its potential role when performing visuoperceptual analysis of FEES.
Physiological analysis of swallowing impairment caused by chronic obstructive pulmonary disease (COPD) in rats.

AUTHORS (LAST NAME, FIRST NAME): Nagoya, Kouta1; Tsujimura, Takanori1; Yoshihara, Midori1; Inoue, Makoto1

Purpose: Chronic obstructive pulmonary disease (COPD) is the respiratory illness, of which the number of patients is expected to increase with age. Dyspnea and cough, sputum are known as the main symptom of COPD, often accompanied by swallowing impairment. Although many clinical reports dealing with swallowing impairment related to COPD have been published, physiological mechanism of swallowing changes due to COPD still remains unclear. So, we analyzed how COPD contributes to swallowing impairment using COPD rats.

Learning Objective:
- Describe the COPD affected the timing of swallowing reflex and the swallowing related muscle activity.

Prophylactic pharyngeal strengthening program in healthy older adults: Preliminary findings

AUTHORS (LAST NAME, FIRST NAME): Molfenter, Sonja M.1; Herzberg, Erica1, 2; Brates, Danielle1; Soyfer, Alexandra3; Riquelme, Luis F.3, 4

Purpose: Sarcopenia is the age-related loss of muscle strength and function. Our recent research has established that pharyngeal sarcopenia is associated with reductions in pharyngeal constriction and increases in pharyngeal residue and therefore may increase the risk for developing age-related dysphagia. The aim of this pilot study was to explore the impact of an 8-week prophylactic pharyngeal strengthening program on swallowing outcomes.

Learning Objective:
- Describe the exercises used in this protocol.
- Discuss the resulting changes to swallowing physiology.

Use of Diffusion Tensor Imaging to Examine Microstructural Changes Following Lingual Strengthening Exercise

AUTHORS (LAST NAME, FIRST NAME): Krekeler, Brittany N.1, 2; Jiancheng, Hou3; Nair, Veena3, 4; Prabhakaran, Vivek3; Rogus-Pulia, Nicole2, 5, 6; Robbins, JoAnne5

Purpose: Central effects of lingual strengthening exercise (LSE) as a treatment for dysphagia remain largely unknown. Diffusion tensor imaging (DTI) is a neuroimaging approach used to identify differences in microstructural changes in white matter tracts driving neural connectivity in the brain. Alterations in white matter structure resulting from clinical interventions can indicate central changes to neural signal processing. The purpose of this pilot study was to measure microstructural white matter changes following LSE in a group of patients with dysphagia.
Learning Objective:
- Describe microstructural changes observed in a small cohort of heterogeneous patients with dysphagia after lingual strengthening exercise.

Is there evidence of tongue fatigue in people with neurodegenerative disease after completion of a 21-item swallowing assessment?

AUTHORS (LAST NAME, FIRST NAME): Gandhi, Pooja1, 2; Plowman, Emily3; Steele, Catriona M.4, 1

Purpose: Previous studies have suggested that the act of eating a meal may induce fatigue in healthy older adults. Bulbar muscle weakness is recognized to be a component of dysphagia in people with Amyotrophic Lateral Sclerosis (pwALS) and Parkinson Disease (pwPD). However, little is known about tongue fatigability in these populations. Therefore, we aimed to measure tongue fatigability in pwALS and pwPD by comparing lingual pressure generation capacity before and after completing a videofluoroscopy (VFSS). We hypothesized that both patient cohorts would demonstrate post-VFSS reductions in lingual pressure generation capacity.

Learning Objective:
- Identify profiles of tongue fatigability in patients with Amyotrophic Lateral Sclerosis and patients with Parkinson Disease by comparing lingual pressure generation capacity before and after completing a videofluoroscopy (VFSS).
- Discuss the impact of neurodegenerative disease on lingual fatigability and guide development of assessment and treatment protocols.

Relationship Between Oropharyngeal Swallowing Impairment, Clinical Bulbar Metrics, and Patient Report in Individuals with ALS.

AUTHORS (LAST NAME, FIRST NAME): DiBiase, Lauren1, 5; Dallal York, Justine1, 5; Croft, Kayla2, 5; Segalewitz, Tara2, 5; Lawrence, Shelby2, 5; Vernon, Grace2, 5; Boesing, Krista2, 5; Mackey, Shauna2, 5; Leonard, Kelly2, 5; Anderson, Amber1, 5; Herndon, Nicole E.3, 2; Plowman, Emily K.4, 5

Purpose: Although it is widely known that people with ALS (pALS) develop bulbar impairment in the form of dysphagia and/or dysarthria, little is known regarding the relationship between swallowing impairment profiles and clinical metrics of bulbar function, or patient perceived impairment. We therefore aimed to examine relationships between oropharyngeal swallowing impairment with bulbar strength, speech, functional oral intake, and patient self-report profiles.

Learning Objective:
- Discuss associations between clinical metrics of bulbar impairment with radiographically confirmed oral and pharyngeal phase deficits in individuals with ALS.