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Dysphagia: Case Studies
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Objectives
1. Recognize case example interview data.
2. Identify traditional/experimental intervention research.
3. Indicate alternative intervention research.

Surface Electrical Stimulation

• Blumenfeld et al. study:
  – compared outcome of surface electrical stimulation of pharyngeal and laryngeal muscles to traditional therapy
  – traditional therapy included:
    • therapeutic exercises
    • compensatory maneuvers
    • diet texture modifications
  – comparison was measured according to the 7-point swallow-severity scale which ranges from nothing safe to aspiration of saliva to toleration of all consistencies
  – both groups showed significant improvement
  – electrical stimulation group showed more improvement, required fewer sessions, and displayed a trend toward shorter length of hospitalization compared to traditional therapy
  – researchers questioned whether the improvement might have been a result of spontaneous recovery
Surface Electrical Stimulation

- Ludlow et al. looked at effects of surface electrical stimulation according to four different conditions:
  - patients had diverse neurological pathologies
  - first group had no stimulation
  - second group had stimulation at sensory threshold level during swallowing
  - third group had stimulation at motor threshold level during swallowing
  - fourth group had stimulation at rest (only hyoid depression)
  - low sensory threshold levels of stimulation produced significant reduction in aspiration and pooling
  - maximum levels of stimulation did not show significant improvement and was suspected to be a result of the resistance of patients’ hyoid elevation during swallowing

Surface Electrical Stimulation

- Shaw et al. studied surface electrical stimulation:
  - 18 patients
  - patients were suffering from diverse neurological pathologies or post-laryngeal radiotherapy
  - patients were divided into four groups according to pre-therapy
    1. near-functional swallow
    2. limited swallowing requiring compensatory maneuvers
    3. enteral feedings with ability to swallow certain consistencies
    4. tube feeding
  - transcutaneous neuromuscular electrical stimulation was found to possibly aid patients who have mild to moderate dysphagia
  - those with severe dysphagia were not able to attain independence from tube feeding
Facilitation Techniques

• Leelamanit et al. discussed effects of stimulating synchronous contraction of the thyrohyoid muscle during swallowing with synchronous electrical stimulator (SES) treatment
  – 22 patients
  – diverse neurological pathologies in addition to dysphagia due to reduced laryngeal elevation
  – videofluoroscopic findings were evaluated along with clinical evaluation and weight gain
  – SES treatment improved dysphagia resulting in reduced laryngeal elevation

Facilitation in Dysphagia

• Lazzara et al. also discussed facilitation in dysphagia
  – thermal stimulation at the anterior faucial pillars
  – patients had diverse neurological pathologies
  – improved triggering of swallowing reflex for the consistency of liquids or paste by 90% for the liquids and 100% for the paste
Swallow Postures/Maneuvers

- Ten studies were done on swallow postures and swallow maneuvers (compensatory techniques and/or rehabilitative techniques)
  - chin tuck and supraglottic or effortful swallow were some of the techniques studied
  - videofluoroscopy was used for the evaluation tool

- Shaker et al. was the only study that was randomized
  - 27 patients studied
  - patients had diverse etiology as well as abnormal upper esophageal sphincter opening
    - neurological pathology, post-pharyngeal radiotherapy, and cardiovascular disease
  - seven patients were randomly assigned to a period of sham exercises – no significant improvement
  - head-raising exercises were incorporated after sham exercises were randomly assigned and resulted in significant changes
    - improvements:
      » the diameter of the sphincter opening and the laryngeal movement
      » decrease of post-deglutition residue
      » resolution of aspiration
    - the seven point competency scale showed positive changes as well
Swallow Postures/Maneuvers

• Three of nine nonrandomized clinical trials performed statistical analyses to check on therapy outcome
• Logemann et al. studied effects of head rotation in acute brainstem stroke patients with unilateral oropharyngeal dysphagia
  – a larger fraction of the bolus was swallowed
  – upper esophageal sphincter diameter increased significantly
  – rotation of the head turned toward the paretic side
• Logemann et al. studied effects of a super-supraglottic swallow in a group of head and neck cancer patients
  – fewer swallowing motility disorders were found
  – in some cases, elimination or reduction of aspiration occurred
• Bülow et al. described the effects of supraglottic swallow, chin tuck, and effortful swallow
  – effortful swallow or chin tuck resulted in significantly less deep contrast penetration into the larynx and reduction of pharyngeal retention
  – swallowing techniques did not improve a weak pharyngeal constriction

Videofluoroscopic Outcome

• Shanahan et al. and Lewin et al. studied effects of chin tuck during a single session in a group of patients suffering from aspiration as a result of diverse neurological pathologies and esophagectomy
  – aspiration was eliminated in both studies in the following percentages:
    • Shanahan et al. found 50% of all subjects studied
    • Lewin et al. found 81% of all subjects studied
• Bogaert et al. confirmed that chin tuck as well as supraglottic swallow in a group of patients with diverse neurological pathologies during a single session could improve the pharyngeal phase of swallowing
  – reduction of premature spilling
  – elimination or reduction of aspiration or penetration
  – however, there were no consistencies
Videofluoroscopic Outcome

- Zuydam et al. included a group of patients following surgical resection of the oropharynx, including the base of the tongue
  - chin tuck was used by all participants
  - supraglottic swallow was added to treatment if aspiration was still present
  - success was found in compensatory procedures in a third of the cases with larger tongue resections
  - success was found in compensatory procedures in all cases with smaller resections
- Logemann studied 9 patients after supraglottic laryngectomy
  - three of the nine were able to take in food orally at 2 weeks postoperatively
  - 7 of the 9 were successful oral feeders by three months

Videofluoroscopic Outcome

- A second, larger study with a similar subject population combined with subjects who had undergone diverse resections; including oral cancer resections, postural techniques were studied with or without supraglottic swallow (single session)
- Larger study with a similar subject population
  - postural techniques were effective in at least 60% of the patients at 1 and 3ml volumes
  - if patient first aspirated at a 3ml volume, the posture technique was effective in 80% of the patients for 5ml boluses
  - all patients who were able to swallow 10ml boluses without aspiration using the posture technique were also able to swallow from a cup
Rehabilitative Techniques

• Two nonrandomized clinical trials
• Statistical analysis was used in both studies to determine therapy outcome
• El Sharkawi et al. studied 8 patients with idiopathic Parkinson’s disease
  – Lee Silverman voice treatment
    • intensive program of voice exercises that targets vocal intensity, quality, and variation
    • increases vocal fold adduction and respiratory support
    • an improved neuromuscular control of the entire upper digestive tract
    • 51% reduction of the number of swallowing motility disorders
    • oral transit time and oral residue were reduced and oropharyngeal swallow, efficiency was improved

Rehabilitative Techniques

• Robbins et al. studied a group of acute and chronic stroke patients
  – used an isometric lingual exercise program
    • air-filled bulb between the tongue and the hard palate
  – after eight weeks of progressive resistance lingual exercise, all patients had significantly increased isometric and swallowing pressures
  – patients reported significant improvement in swallowing function and dysphagia-specific quality-of-life measures
  – patients also reported changes in their social life and dietary intake
  – however, therapy outcome could not be distinguished from possible spontaneous recovery
Surface Electromyography

- Huckabee and Cannito
  - 10 patients were studied suffering from brainstem injury and chronic dysphagia
  - surface electromyography biofeedback and cervical auscultation biofeedback in addition to:
    - effortful swallow
    - the Mendelsohn maneuver
    - vocal adduction exercises
    - oral motor exercises
    - the head-lifting maneuver
    - compensatory mechanisms
  - significant improvements
    - swallowing physiology as measured by severity ratings of videofluoroscopic swallowing studies
    - diet level
    - pulmonary status

Surface Electromyography

- Elmståhl et al. studied acute stroke patients
  - effects of therapy on nutritional and anthropometric variables were observed
  - for ~ 2 months, therapy focused on oral motor exercises, swallowing strategies, head and neck positioning, and diet modifications
  - ~ 60% of all patients responded with better swallowing function and improved nutritional status
  - oral dysfunction (dissociation) was reduced
  - pharyngeal dysfunction (penetration and constrictor paresis) was also reduced
  - subjective complaints did not correlate with swallowing function or nutritional improvements

- Prosiegel et al. in first study included 208 subjects with diverse neurological pathologies
  - patients received functional swallowing therapy, including restitution methods, compensation, and adaptation
  - more than 80% of the patients received all of the treatments
  - functional feeding status showed significant improvement
  - 55% of all patients were able to discontinue tube feeding and be independent on oral feedings
Surface Electromyography

• In the second study, three subpopulations of patients were studied with posterior fossa tumors or cerebellar hemorrhage, Wallenberg’s syndrome, and Avellis’ syndrome or unilateral paresis of the vagal nerve
  – functional feeding status improved in all three groups
  – those with Avellis’ syndrome or unilateral paresis of the vagal nerve had a significantly better functional outcome than patients with Wallenberg’s syndrome
  – those with Wallenberg’s syndrome had a significantly better outcome than patients with posterior fossa tumors or cerebellar hemorrhage
  – more than 50% of those with posterior fossa tumors or cerebellar hemorrhage and 30% of those with Wallenberg’s syndrome were dependent on tube feeding
  – none of the patients with Avellis’ syndrome or unilateral paresis of the vagal nerve were on tube feeding

Acupuncture Research

• Journal of Acupuncture and Tuina Science Dec 2006
• Postapoplectic dysphagia
• Treatment group
  – acupuncture and rehabilitation
    • acupuncture was performed
    • needle tips toward submaxilla on left then right side
    • acupuncture once per day
    • 12 treatments
• Control group
  – rehabilitation only
• Results
  – 95% of the treatment group had remarkable improvement
  – 71.9% of the control group had remarkable improvement
VitalStim®

- Introduced in 2003
- Specialized form of neuromuscular electrical stimulation (NMES) specifically designed for dysphagia
- Re-educates the throat muscles needed for swallowing
- Portable dual channel electrotherapy system
- Certification included 2-week online learning curriculum followed by 2-day on site certification course for speech therapists and occupational therapists
- VitalStim® can only be administered by those who have been certified
- Treatment sessions begin after patient has been medically evaluated
- Electrodes are placed on the skin at specific points on the patient’s throat then feeding practice and other exercises are performed
- Therapy is ongoing until the patient’s swallowing patterns have been restored to optimum level
- Results are usually seen in 6-20 daily sessions

VitalStim®

- Cost of VitalStim®
  - comparatively less than a feeding tube
  - feeding tube reported to average $31,000 per patient per year
- Safety of VitalStim®
  - demonstrated to be safe
  - no adverse events were reported with any patient or any disease state
  - Freed and colleagues tracked pulse oximetry reading and cardiac function
- Freed and colleagues tracked pulse oximetry reading and cardiac function
  - total of 892 patients
    - no reported laryngospasm
    - no reports of bradycardia
    - no reports of electromagnetic interference with cardiac pacemakers
    - 29 of the patients were pediatric
VitalStim® Efficacy

- Carnaby-Mann and Crary
  - reviewed 81 papers on use of surface electrical stimulation for dysphagia
  - no adverse effects were found
  - statistically significant positive treatment effects were found
- Bulow and colleagues
  - studied electrotherapy vs traditional treatment techniques in stroke patients with chronic dysphagia
  - both treatment approaches produced positive treatment outcomes

VitalStim® Satisfaction

- User and patient satisfaction
  - Crary and colleagues
    - independent study
    - survey sent to 2,000 practicing SLPs
    - users reported good outcomes
    - patient satisfaction was good as well
    - no adverse events
Head and Neck Cancer

- Studies have been conducted to determine effects of NMES in cancer population
  - positive beneficial treatment for pain, xerostomia, and mucositis resulting from radiation therapy
  - recent findings have shown improved functional swallowing after radiation
- Studies have been conducted to determine effects of NMES in cancer population
  - NMES shown to be a possible preventative of dysphagia as well as a curative treatment modality
  - Lin et al. confirms improved swallowing after NMES in chronic dysphagia one year after radiation for nasopharyngeal cancer
- Head and neck cancer pain with surface electrotherapy
  - 3 patients post surgery and radiation therapy for squamous cell carcinoma of head and neck
  - electrotherapy delivered for 2 minutes to painful areas of head and neck
  - all patients had significant decrease in pain with no side effects

Stroke and NMES

- Stroke or cerebrovascular accident (CVA) is the most common diagnosis of patients who have dysphagia
- Hard to evaluate since dysphagia may be resolved in the first 6 months following a stroke
- Shaw et al. studied dysphagia in an inpatient setting
  - 45% of 18 patients were stroke patients
    - improved swallowing ability
    - decreased need for tube feeding
    - improved diet level
VitalStim®

- Reimbursement for VitalStim®
  - not reimbursed for “off label” equipment and supplies
  - meets Medicare standards
- Research studies
  - opercular syndrome
    - 76-year-old man with severe dysphagia
    - 2 consecutive strokes
    - patient failed prior traditional therapy
- Research studies
  - opercular syndrome
    - VitalStim® therapy delivered for 60 minutes over a period of 5 months
    - patient returned to full oral intake with minor diet modifications
    - Baijens 2008

Multiple Sclerosis (MS)

- NMES in patients with multiple sclerosis
  - 25 patients with MS and swallowing problems
    - 16 male
    - 9 female
    - average years of age: 53.1
  - 6 treatment sessions over 3 weeks (2 sessions per week)
  - patients instructed to swallow as soon as they felt electricity which surged in and out for 20 minutes
  - suprathyroid (submandibular) and thyrohyoid muscles were stimulated
  - significant decrease in piriform pooling of secretions, less aspiration of thin liquids, and improved self-reported swallowing ability and quality of life
Massage Therapy

- Dysphagia case study
  - middle age man who had surgery through his neck
  - dysphagia and cough ensued
  - after 3 visits with massage therapist, patient was able to eat
  - after 1 week, patient’s cough subsided
  - after 2 months, patient was free of all dysphagia and cough

Alternative Therapies

- Providers need to be aware that alternative therapies may be sought
- Patients need to be cautioned regarding therapies which may induce aspiration and do not have efficacy
Wrap-Up

- All treatments for dysphagia are centered around the goal of nutrition for the patient
- Dietitians are important for the management of patients’ nutritional status

Dysphagia: Case Studies

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