Oral Motor Exercises for the Treatment of Motor Speech Disorders: Efficacy and Evidence Based Practice Issues

A literature review based on a tutorial by Heather M. Clark (2003)

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The Treatment Approach

- Oral Motor Treatment
  - Non-speech and "speech-like" tasks
  - Goals target → lips, jaw, and tongue
  - Speech-oriented tasks to restore or modify impaired communication by *altering speech*
- Neuromuscular Treatment (NMT)
  - Neuromuscular dysfunction
  - Motor Speech Disorders → Dysarthria and dysphagia

Why use neuromuscular treatments?

- Speech → neurocognitive, neuromuscular, & musculoskeletal activities
  - Neuromuscular control → execution
- Dysarthria
  - Disturbances in neuromuscular control over the speech mechanism
  - Paralysis, weakness, & incoordination
- Improve speech & speech intelligibility = reduce neuromuscular impairment
  - Increase muscle strength and endurance
  - Normalize muscle tone

Neuromuscular Treatment & Evidence Based Practice

- Is this treatment approach beneficial?
  - Clinical expertise & clinical evidence
- Treatment Strategies
  - What is the neuromuscular impairment or function targeted?
  - How does it apply to improving the speech and/or swallowing musculature?
- Empirical Evidence
  - Is the empirical support sufficient for evidence based practice?

Active Exercises

- What is the targeted neuromuscular impairment?
  - Weakness and disrupted muscle tone
- How will active exercise improve muscle function and motor control for speech?
  - Strength training → Increase muscle strength and endurance
- Key Principles of Strength Training
  - Overload
  - Contraction Velocity
  - Specificity of Training

Empirical Support?

- Active Exercises
  - Rosenfeld & Johnson (1999)
    - Drinking straws & liquid consistencies
- Lingual Strength & Speech
  - "it turns out very little strength is needed for speech"
    - Lof (2003)
  - Parkinson's Disease example

Passive Exercises

- Massage & Passive Stretch
- What is the targeted neuromuscular impairment?
  - Hypertonicity and spasticity
- How will active exercise improve muscle function and motor control for speech?
  - Massage → relax muscles & reduce muscle tension
  - Stretching → inhibit stretch reflex → decrease muscle tone → increase ROM

Empirical Support?

- Passive Exercises
  - Clark (2003)
    - Stretching → "tongue wags", protruding the tongue out of the mouth, pursing and retracting the lips, saying "ohh" and "ahh", etc.
    - Oral musculature does not display the same muscle stretch patterns as the limbs
  - Principles of Motor Learning
    - Understand the problem, rationale for treatment, & learn procedures to complete task autonomously and transfer skills.

Physical Modalities

- What is the targeted neuromuscular impairment?
  - Muscle spasm & dysphagia
- How will active exercise improve muscle function and motor control for speech?
  - Physical agents (heat, cold, electricity, & vibration)→ "induce a therapeutic response in tissue" Clark (2003)
  - Electromyogram (EMG) Biofeedback → reduce hypertonicity & spasticity in articulatory muscles

Empirical Support?

- Physical Modalities
  - Dysphagia
    - Vibration
    - Sensory stimulation (cold & hot food temperatures)
  - Duffy (2005)
    - EMG Biofeedback
      - Spastic Dysarthria
        - Improvement in speech and drooling
        - Improvements maintained over time

The general consensus agrees…

"the effectiveness of non speech techniques to alter muscle tone and strengthen oral muscles is difficult to quantify and has yet to be determined for the population of persons with dysarthria"

Theodoros & Thompson-Ward (1998)

Task Specificity → to improve speech, use speech!

- Same Structures, Different Functions
  - "…speech movement control was mediated at a different level in the nervous system than was nonspeech movement control"
    - Love (2000)
- Part-Whole Learning
    - Gregory Lof (2003)
- Transfer of Training
  - Speech is highly organized and interconnected!

Where is all the research?

"It is not surprising that treatments lacking appropriate theoretical foundation have failed to inspire controlled study".

Heather M. Clark (2003)

Conclusion

- Functional movement for speech is achieved by completing *purposeful* tasks
- Don't waste your time and the client's time…

<u>TO REHABILITATE SPEECH, USE SPEECH!</u>

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