Dysarthria and Dysphagia: a Neurology Perspective

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Disclosures

- I have no relevant conflicts or potential conflicts to disclose regarding this talk
Outline

- Review of terms
- Normal speech production
- Types of neurologic dysarthria and the diseases that cause them
- Treatment of conditions that cause dysarthria
- *Brief overview of the neurology of dysphagia
- Questions and discussion
Terminology and concepts
- Dysarthria
  - ‘motor speech disorder’ ASLHA

- Upper v Lower motor neurons
Normal speech production
Speech is complex!

- Respiratory muscles
- Laryngeal movements
- Pharyngeal muscles
- Palate movement
- Tongue movement
- Lip movements
Respiratory

- Upper cervical cord anterior horn neurons (C3-5)
- Phrenic nerve
- Diaphragm
- Intercostal muscles
Larynx

- Vagus (10) via:
  - Superior laryngeal nerve
  - Recurrent laryngeal nerve
- Vocal cords
- Vocal folds
Pharynx

- Controlled by Glossopharyngeal (9) and Vagus (10) nerves
  - Gloss. primarily provides sensory input
  - Vagus provides motor to palate elevators, pharyngeal muscles
- Vagus closes superior pharynx with velopalatine muscle contraction
Lingual contributions

- Tongue is innervated by the hypoglossal nerve (12)
- Important in consonant formation
  - /l/, /t/, /d/
Labial contribution

- Involved muscles are innervated by facial nerve (7)
- Orbicularis oris
- Levator/Depressor labii muscles
- Mentalis and buccinator muscles
Bedside evaluation of dysarthria
Bedside testing

- Respiratory
- Vocal cord / laryngeal assessment
- Pharyngeal / palatine functioning
- Lingual assessment
- Labial assessment (dentition)
Neurologic forms of dysarthria
Neurologic forms of dysarthria

- Flaccid dysarthria
- Spastic dysarthria
- Rigid (aka hypokinetic) dysarthria
- Hyperkinetic dysarthria
- Ataxic dysarthria
- Potpourri
Flaccid dysarthria

- Typically lower motor neuron dysfunction
  - Motor neuron disease
  - Brainstem injury
  - Peripheral nerve injury
  - Myasthenia Gravis

- Always associated with dysphagia

- Vibratives particularly difficult

- Guillan-Barre Syndrome (GBS), Lyme disease, Sarcoid
Flaccid dysarthria treatment

- Depends on cause, all will include ST
- Myasthenia gravis
  - Immunosuppression (long term)
  - Mestinon (pyridostigmine)
- GBS
  - IVIg or Plasma Exchange acutely
  - Immunosuppression chronically
- Sarcoidosis – Immunosuppression
- Lyme disease – doxycycline
Spastic dysarthria

- “Strain-strangle”, harsh, slow, imprecise consonants
- Bilateral disruption of UMNs
  - Vascular, demyelination, ALS
- Absence of atrophy/fasciculations; Jaw jerk present
- Acute anarthria from unilateral lesions
- Associated with pseudobulbar affect, disturbed breathing
Spastic dysarthria treatment

- ST
- Spasticity management
- Reduce future strokes
Rigid dysarthria
(aka hypokinetic)

- Rapid rate, reduced volume, monotonous, hastily spoken words, whispering in extreme cases
- Found in Parkinson’s disease and related diseases
- May be associated with drooling
Rigid dysarthria treatment

- Depends upon underlying illness, all include ST
- PD
  - Treatments include levodopa, dopamine agonists, amantadine, MAO-B inhibitors, DBS
- PD plus associated dysarthria rarely responds to treatment
Hyperkinetic dysarthria

- Loud speech, harsh, improperly stressed syllables/words, poor coordination with breathing
- Associated with chorea and myoclonus
- Abrupt muscular contractions interrupt speech
  - Termed ‘hiccups’ speech
- Tourette’s
  - Vocal tics (barking, squeals, sniffs/snorts, grunting)
  - Speech disturbances – stuttering copro/echo-lalia
Hyperkinetic dysarthria
treatment

- Chorea
  - Xenazine (tetrabenazine)
  - Treat infection (Sydenham’s Chorea)

- Myoclonus
  - Benzodiazepines
  - Anti-epileptic medications

- Tourette’s
  - Dopamine depletors, ?stimulants, ?antidepressants

- DBS
Ataxic dysarthria

- Slow speech, slurring of syllables/words, unnatural separation of syllables and words
- Impaired coordination of respiration and speech; explosive speech
- Acute and chronic cerebellar lesions, demyelinating diseases, MSA-c
Ataxic dysarthria treatment

- Per usual, ST!
- Reduce disease burden going forward
- Resection of cerebellar tumors/lesions
- Treatment of cause of cerebellar dysfunction
Miscellaneous

- Spasmodic dysphonia
  - Likely extrapyramidal
  - Strangled speech; whispering intact
- Aphonia / Dysphonia
- Acquired stuttering
Miscellaneous treatment

- Spasmodic dysphonia
  - Botox to TA, LCA, PCA
  - Crush a recurrent laryngeal nerve

- Aphonia / Dysphonia
  - Improve ventilation

- Acquired stuttering
  - ST!
Dysphagia
Video

https://www.youtube.com/watch?v=pNcV6yAfq-g
Neurologic dysphagia

- Up to 50% of long-term care facility residents
- Most common in neurodegenerative diseases
- Evaluated by bedside swallow testing, MBS, FEES
- Treat underlying disease, behavioral modifications
Stroke

- Dysphagia often occurs immediately but can rapidly improve
- MBS at 3-4 days and then repeat in 2-3 weeks
- Multiple strokes increases risk of dysphagia
Parkinson’s

- Often silent so low suspicion needed
- Residual food in valecula
- Treat underlying disease
Amyotrophic Lateral Sclerosis

- Dysphagia can be early or late
- Oral phase typically affected first, tongue atrophy and fasciculations
- Weight loss is common, portends worse outcome
- MBS every few months
- PEG placement early
Myasthenia Gravis

- Dysphagia (or dysarthria) may be first symptom
- Worsens with fatigue, later in day
- Associated with nasal speech, hoarseness can occur
- MBS early and often
  - *On and off meds
Multiple Sclerosis

- Up to $\frac{1}{3}$rd of patients with MS have dysphagia
- Correlates with overall disability
- Can affect all phases but typically more likely to affect oral stage early and pharyngeal stage later
- No treatment (other than ST)