Speech disorders

SPEECH DISORDERS

DYSPHONIA

1. Vocal cord muscle paralysis / fatigability
2. Spasmodic dysphonia

DYSARTHRIA

1. Lower motor neuron (flaccid dysarthria)
2. Upper motor neuron (spastic dysarthria)
3. Cerebellar (ataxic dysarthria)
4. Extrapyramidal (hypo- / hyper-kinetic dysarthria)
5. Mixed dysarthria

SPEECH TESTING

CN7 – pronounce **LABIAL SOUNDS** – M, B, P. "Say 'baby hippopotamus'"
CN12 – pronounce **LINGUAL SOUNDS** – T, D, L. "Say 'yellow lorry'"
CN10 – ask patient to cough and to say 'Aaah' (**PALATAL SOUNDS**)
Ask the patient to count steadily to 30 - to assess for *muscle fatigue*.

THERAPY

- generally focuses on teaching *compensatory strategies* and *self-correction of errors*.
- *exercises of* oral, lingual, buccal, and laryngeal *musculature* may increase physiologic support for speech.

DYSPHONIA

– inability to vocalize (loss of voice - breathy sound);
– due to **disorder of LARYNX or its innervation** (abnormal apposition of vocal cords).

VOCAL CORD DYSFUNCTION / PARALYSIS

1. Laryngitis
2. Damage to superior laryngeal nerve
3. Nodules, polyps, carcinoma.
4. Muscle paralysis or fatigability (after excessive speaking).

SPASMODIC DYSPHONIA

- **dystonic spasms** of laryngeal muscles:

a) ***ADDUCTOR type*** (most common form) - voice is strained (effortful, strangulated), high-pitched, punctuated by repetitive brief interruptions of speech.
H: botulinum toxin injection into thyroarytenoid muscle

b) ***ABDUCTOR type*** - voice has whispering, breathy quality.
H: botulinum toxin injection into posterior cricoarytenoid or cricothyroid muscles - technically more difficult → less satisfactory results

- patient may employ certain ***"tricks" to briefly overcome dystonia***, presumably by using other motor pathways to accomplish desired movement (e.g. some patients may find their voice nearly normal when singing or shouting).
- cause - basal ganglia dysfunction.
- rare nonprogressive syndrome.
- occurs in middle aged - elderly individuals.

DYSARTHRIA

- **lack of motor control over PERIPHERAL SPEECH ORGANS** – consistent disturbance in ***articulation*** of individual sounds:

a) labials (n. facialis) – M, B, P
b) gutturals (n. vagus)
c) linguals (n. hypoglossus) – T, D, L

FLACCID dysarthria (s. LMN dysarthria, BULBAR PARALYSIS)

- speech is slurred and progressively less distinct.
- special difficulty in **vibrative letters** (such as "R").
- bilateral palate paralysis → ***nasal quality*** speech.
- vocal cord paralysis → ***raspy quality*** speech.
- facial diplegia → impaired **labials**.
- tongue paralysis → impaired **linguals**.
- in myasthenia gravis speech worsens as patient continues to speak.

SPASTIC dysarthria (s. UMN dysarthria, PSEUDOBULBAR PARALYSIS)

- harsh, low-pitched, slow, monotonous verbal output that sounds strained or strangled ("Donald Duck" speech).
- may occur with *nonfluent aphasia* (particularly Broca aphasia).

ATAXIC dysarthria

- **cerebellar** disease.

- slowness of speech, altered rhythm, irregular breakdowns, improper stress - uneven, jumpy (staccato), unpredictable output.
- disturbed *speech & respiration coordination*:
  a) not enough breath to utter certain words or syllables.
  b) greater strength than intended (***explosive speech***).
- SCANNING SPEECH - ***disrupted PROSODIC quality*** - slow, deliberate, segmented (unnatural separation of syllables), monotonous speech;
  - normal grammatical and semantic competence, normal articulation;
  - lesion at **decussation of brachium conjunctivum** in mesencephalon (crossed efferent cerebellar pathways).
  - part of **Charcot triad** [ataxia, nystagmus, scanning speech] - historically considered to be pathognomonic for *multiple sclerosis*, but more common with *head injuries*.

HYPOKINETIC / HYPERKINETIC dysarthria

- **extrapyramidal** disease.

1. **Hypokinetic dysarthria** (Parkinson and other rigid types of extrapyramidal disorders) - rapid utterances, word slurring, decrescendo volume at ends of sentences; voice is low pitched and monotonous, lacking both inflection and volume (hypokinetic and hypophonic); in advanced states only whispering is possible.
2. **Hyperkinetic dysarthria**:
   a) ***choreiform dysarthria*** (choreiform disorders, myoclonic disorders) - BURSTING SPEECH: prolonged phoneme and sentence segments, intermixed with silences; variable, often improper, stress (phoneme inflections).
   b) ***dystonic dysarthria*** (in dystonia musculorum deformans) - slower rate, prolongation of individual phonemes and segments; unexpected appearances of stress or silence.

MIXED dysarthrias

- combination of spastic, flaccid, ataxic, and hypokinetic / hyperkinetic dysarthrias.
- common (e.g. multiple sclerosis, Wilson's disease, advanced amyotrophic lateral sclerosis).

MUTISM

- total loss of speech.

1) most often involves **upper motor neurons**.
   - **aphasic** patients frequently present with *initial mutism*.
   - *persistent mutism* is associated with bihemispheric involvement (particularly of mesial **frontal lobes**).
   - **bilateral dysfunction of upper brain stem or frontal septal area** – lost initiation of both behavior and verbal output (AKINETIC MUTISM).

2) mutism can also be **psychogenic**.

SPEECH-RELATED DISORDERS

1. Phonic tics and vocalization
2. Reiterative speech:
    a. Echolalia
    b. Palilalia
    c. Stuttering
    d. Logoclonia

PHONIC TICS & VOCALIZATIONS

- involuntary sounds:

A. **Simple vocal tics** - similar in character to motor tics (inarticulate noises and sounds - throat clearing, grunts, coughs, shouts, snorts, word accentuation).
B. **Complex vocal tics** - articulate words, phrases, sentences (e.g. echolalia, coprolalia).

Etiology:

1. Gilles de la Tourette syndrome.
2. Degenerative diseases of nervous system (e.g. neuroacanthocytosis, Huntington's disease)
3. Neuroleptic medication.

REITERATIVE SPEECH DISTURBANCES

[*angl*. **reiterative** – kartotinis]

Echolalia

- mandatory tendency to **repeat what has just been said by examiner**.

- fully developed echolalia encompasses *entire phrases and sentences*.
- patient apparently ***unaware*** of what he or she is saying.
- most have COMPLETION PHENOMENON - if started on phrase that is not completed (red, white, and _____), correct word is supplied by patient automatically.
- most often encountered in **transcortical aphasias** (esp. transcortical sensory and mixed transcortical); also in many **degenerative brain diseases**.

Palilalia

- involuntary **repetition of words / phrases during verbal output**.

Etiologic associations:

1) some aphasias.
2) basal ganglia involvement
3) untreated schizophrenia
4) paramedian thalamic damage
5) later stages of degenerative brain diseases (e.g. Alzheimer's disease)
6) electrical stimulation of left hemisphere sites.

Logoclonia

- tendency to **repeat final syllable of word**.

- indicates bilateral brain dysfunction (e.g. later stages of dementia).

Stutter

- difficulty in producing smooth flow of speech - multiple rapid **iteration of uttered partial-word** (not whole word!)

- associated with ***right cerebral dominance*** and ***widespread overactivity of* cerebral cortex & cerebellum**.
- includes overactivity of ***supplementary motor area*** (stimulation of this area produces **laughter,** with duration and intensity proportionate to stimulus intensity).

A. **Developmental stutter** - common (particularly among *developing males*; accompanied by physical & emotional discomfort) - involuntary repetition of ***first syllable*** of word; initiation of word is followed by:
   a) machine gun-like repetition (STUTTER)
   b) prolonged silence (STAMMER).
      – by late childhood, many children recover from stuttering.

B. **Acquired stutter** - repetitions and prolongations ***not restricted to initial syllable***; patient does not exhibit anxiety associated with difficult performance - bilateral brain dysfunction (no focal neuroanatomical site).

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