Managing ILS as a Central Sensitivity Syndrome

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Irritable Larynx Syndrome (1999)

hyperkinetic laryngeal dysfunction  
(laryngospasm, cough, dysphonia / globus)

due to

CNS over-reaction to normal sensory stimuli

in response to a definitive triggering stimulus

ILS - Pathways to CNS Plastic Change

Journal of Voice, 13 (3), 1999

Psych Factors & Habituation

Chronic Stimulation

GERD

CNS

VIRUS

ILS Features

Set-up for spasm: “Non-triggered hypertonic state”

ILS

Non-triggered hypertonic state

Irritants

Tone modulators

MUSCLE SPASM

Dysphonia  Laryngospasm  Globus & Cough
Neural plastic response to repetitive nocistimulation

Sensory-emotional Triggers
- ILS Sx attacks triggered by a sensory or emotional-sensory stimulus
  - External: airborne sensory, such as smoke, temperature changes or specific odours
  - Internal: eg. reflux, inappropriate voice use, strong tastes
  - Emotionally-laden memory associated with odor or other external/internal stimuli

GE Reflux
- 24 hour pH study:
  - 39/45 positive (Journal of Voice 13(3) 1999)
  - 41/47 positive (CJSLPA, 34(4) 2010)
  - 181/195 treated long-term PPI (CJSLPA, 34(4) 2010)
- GER seems to play a major role in development of throat (ILS) symptoms in patients with acquired CNS hypersensitivity.

ILS: A Central Sensitivity Syndrome?
- Heightened sensitivity of central neurons
- Altered activation thresholds, and enhanced responsiveness to synaptic inputs as with neuropathic pain (Woolf C.J, Slater MW. Science 2000; 288:1765-8)
- Underlying Neuro-Endocrine-Immune (NEI) pathology? (Morrison et al, 1999; Yunus, 2000-2008)
- CS verified by testing neurotransmitters, neuro modulators with nociceptive spinal flexion reflex, Functional MRI and cerebral evoked potential by ElectroEncephaloGraphy (Yunus, 2005; 2007)
Possible other CSS disorders (Yunus, 2000-2008)

- Chronic pain (neuropathic)
- Chronic fatigue syndrome
- Fibromyalgia
- Irritable bowel syndrome
- Irritable bladder (interstitial cystitis)
- Chronic pelvic pain
- Temporo-mandibular joint disorder
- Multiple chemical sensitivity
- Chronic headache

ILS as a CSS (CJSLPA 34(4) 2010)

- Retrospective chart analysis
- Grad student (SLP) unfamiliar with patients
- 195 consecutive patients with Dx ILS
- Represents 3.5% of voice clinic pop.

- Data: demographics; Sx; Sx Triggers; Clinical eval results; Para-laryngeal palpation scores; Sx Impact (V-RQOL); Other Dx; Treatments

Paralaryngeal Muscle Hypertonicity
(as assessed by Palpation, Journal of Voice 16(3), 2002)

Moderate-Severe Scores (2/3 or 3/3):

- Supra-hyoids: 150 (77%)
- Thyro-hyoids: 166 (85%)
- Cricothyroids: 144 (74%)
- Upper Constrictors: 121 (62%)

Laryngospasm, cough or voice as 1° ILS Sx
(N = 195; 176 female; 19 male;
98 employed; 33 retired; 17 “domestic engineers”)

<table>
<thead>
<tr>
<th>Gender</th>
<th>1° Sx</th>
<th># pt</th>
<th>Age</th>
<th>Other Sx</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>LxSpm</td>
<td>142</td>
<td>20-76(50)</td>
<td>Lxspm only: 29 + voice: 75 + cough 59 + globus 27</td>
</tr>
<tr>
<td></td>
<td>Cough</td>
<td>19</td>
<td>42-68(55)</td>
<td>Cough only: 4 + voice: 13 + globus: 7</td>
</tr>
<tr>
<td></td>
<td>Dysph</td>
<td>15</td>
<td>37-66(52)</td>
<td>Voice only: 5 + cough: 6 + globus: 7</td>
</tr>
<tr>
<td>M</td>
<td>LxSpm</td>
<td>17</td>
<td>24-77(48)</td>
<td>Lxspm only: 2 + cough: 12 + voice: 9 + globus: 4</td>
</tr>
<tr>
<td></td>
<td>Cough</td>
<td>2</td>
<td>41-47(44)</td>
<td>Cough only: 0 + voice 2</td>
</tr>
</tbody>
</table>
Symptom Triggers
All 195 vs. Female laryngospasm (141)

<table>
<thead>
<tr>
<th>All Pts</th>
<th>F LxSpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odors</td>
<td>106 54%</td>
</tr>
<tr>
<td>Stress</td>
<td>100 51%</td>
</tr>
<tr>
<td>Eating</td>
<td>36 18%</td>
</tr>
<tr>
<td>Lying down</td>
<td>38 19%</td>
</tr>
<tr>
<td>Talking</td>
<td>41 21%</td>
</tr>
<tr>
<td>Exercise</td>
<td>27 14%</td>
</tr>
</tbody>
</table>

Re-Program the Central System
Psychological Factors

- May need to recognize links between sensory triggers and psychological events
  Eg. Olfactory memories triggering Sx
- Desensitize physical reaction
- May need to recognize/manage contribution of repression of vocal expression of emotions to laryngeal muscle misuse

CSS Co-morbidities reported

- Irritable Bowel Syndrome 112 (57%)
- Chronic Fatigue Syndrome 81 (42%)
- Fibromyalgia 55 (28%)
- Chronic Headache 96 (49%)

Prevalence of multiple co-morbidity

<table>
<thead>
<tr>
<th># diag</th>
<th>All ILS pts (195)</th>
<th>%</th>
<th>Female lxs (141)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32</td>
<td>16%</td>
<td>23</td>
<td>16%</td>
</tr>
<tr>
<td>1</td>
<td>61</td>
<td>31%</td>
<td>41</td>
<td>29%</td>
</tr>
<tr>
<td>2</td>
<td>52</td>
<td>27%</td>
<td>39</td>
<td>28%</td>
</tr>
<tr>
<td>3 or 4</td>
<td>50</td>
<td>26%</td>
<td>38</td>
<td>27%</td>
</tr>
</tbody>
</table>
ILS co-morbidity compared to general population

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>ILS patients</th>
<th>General pop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritable Bowel</td>
<td>57%</td>
<td>8%</td>
</tr>
<tr>
<td>Chronic Fatigue</td>
<td>42%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>28%</td>
<td>2%</td>
</tr>
<tr>
<td>Chronic Headache</td>
<td>49%</td>
<td>10%</td>
</tr>
</tbody>
</table>

3-pronged treatment for ILS as CSS

**Minimize Triggering Stimuli External & Internal**
- Maximize Reflux Management!
- Maximize Compliance

**Re-Program the Laryngeal Motor Responses**
- Desensitize
- Motor Re-learning

**Re-Program the Central System**
- Centrally Active Medications

**Minimize Triggering Stimuli External & Internal**

**Explain the Reflux Reflex**
- Irritability induced by gastroesophageal reflux may be due to:
  - Direct esophago-laryngeal reflex pathway
  - Laryngeal exposure to refluxate.
- Asthma-like reactions in parasympathetic laryngeal muscle system comparable to bronchial responses in “true” asthma.
- Many pharyngeal/laryngeal symptoms result

(Gill & Morrison, *J Otol*, 1998)

**Maximize Compliance**
- ID sensory triggers in (external and internal) environment
- May need to modify environment and/or behaviours initially to minimize exposure to triggers
- Use multi-modalities to maximize reflux Rx compliance (eg. “But Doctor…”)

- **Re-examine sensory triggers in (internal and external) environment**
- **Use multi-modalities to maximize reflux Rx compliance (eg. “But Doctor…”)**
Tone-down para/laryngeal tension

- Suprathyroids
- Thyrohyoids
- Pharyngeals

Methods:
- Direct (Manual Therapy)
- Indirect (Posture, CVO, Resonance)

Specific Techniques
- Postural change (e.g., drop head forward)
- Back/abdominal breathing
- Sniffing/panting/yawning
- Pursed lips breathing (Blager, 2002)
- Relaxed breathing with jaw relaxed, tongue forward, suprathyroids neutral
- Prolonged ‘ssssss’ (Mathers-Schmidt, 2004)
- Rhythmic CVOs: “Hm; Hm; Hm…”, tongue relaxed

Use Resonance Feedback

- Nasal Resonance or Oral “Sensory” Sounds to:
  - Shift sensory focus
  - Improve vocal fold posture
  - Optimize vocal tone and power
  - Relax suprathyroids and thyrohyoids

Pharmaceutical/Chemical Rx

- From Chronic Pain literature:
  - SSRI antidepressants
  - Tricyclic antidepressants (side effect dry mouth)
  - Baclofen, (centrally acting spasmolytic)
  - Gabapentin (antiepileptic)
- Botox
- Exercise (Endorphins!)
Thank you for your attention!

Past or present self-reported diagnoses in ILS Patients

- Depression 106 (54%)
- Anxiety disorder 75 (38%)
- PTSD 9 (5%)
- Irritable Bowel Syndrome 112 (57%)
- Asthma 106 (54%)
- Chronic Fatigue Syndrome 81 (42%)
- Chronic Headache 96 (49%)
- Multiple Chemical Sensitivity 69 (35%)
- Fibromyalgia 55 (28%)
- Temporomandibular Joint Dys 33 (17%)

Treatments for 195 ILS Patients

- Proton Pump Inhibitors 181 (93%)
- Steroid Inhalers 113 (58%)
- Antidepressants 92 (47%)
- Voice Therapy 52 (27%)
- Psychotherapy 38 (19%)
- Massage/Manual Therapy 30 (15%)
- Botox 13 (10%)
- Prednisone (pre ILS Dx) 25 (13%)
- Nissen fundoplication 6 (3%)
- Tracheotomy 2 (1%)