EMERGING TECHNIQUES IN PHYSICAL THERAPY: DRY NEEDLING

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DISCLOSURES

• No disclosures to report.
OBJECTIVES

• Following the presentation:
  • The participant will identify the purpose, effects and use of dry needling.
  • The participant will recall contraindications and risks of using dry needling in the clinic.
DRY NEEDLING (DN)
# DRY NEEDLING VS. ACUPUNCTURE

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of thin filiform needle</td>
<td>Location – trigger point</td>
</tr>
<tr>
<td>No use of medication</td>
<td>Number of needles used</td>
</tr>
<tr>
<td></td>
<td>Length of treatment</td>
</tr>
<tr>
<td></td>
<td>Depth</td>
</tr>
<tr>
<td>Pistoning</td>
<td>Local twitch response (LTR)</td>
</tr>
</tbody>
</table>
DRY NEEDLING

- Effects of dry needling include:
  - Increased blood flow
  - Decreased spontaneous electrical activity (SEA)
  - Biochemical changes
  - Central nervous system changes
BLOOD FLOW

- **Participants**: 20 right handed healthy female office workers
- **Inclusion criteria**: minimum of 4 hours of computer work each day
- **Exclusion criteria**: pain for more than 8 days in the last year in neck/shoulder region with >2/10 pain, past traumatic/surgical history in neck or upper limb regions
- **Purpose**: Determine changes in blood flow/oxygen saturation with single DN treatment

Cagnie et al., 2012
Cagnie et al., 2013
BLOOD FLOW CONT.

Cagnie et al., 2012
Cagnie et al., 2013
BLOOD FLOW CONT.
SPONTANEOUS ELECTRICAL ACTIVITY (SEA)

- **Subjects**: nine rabbits
- **Treatment**: Rapid insertion dry needling in biceps femoris on one side and very slow needle insertion in contralateral side
  - Recorded number of LTRs bilaterally
  - Measured SEA immediately after
- **Purpose**: Distinguish relationship between DN/LTRs on SEA

Chen et al., 2000
SEA CONT.
SEA CONT.
BIOCHEMICAL CHANGES

- **Participants:** 9 healthy subjects placed in active, latent, or normal groups
- **Design:** Measured pH, substance P, and CGRP in active upper trapezius and compared to contralateral healthy gastrocnemius
- **Purpose:** Compare and contrast biochemicals in muscle with MTPs compared to normal tissue before and after dry needling

Shah et al., 2008
BIOCHEMICAL CHANGES CONT.

Shah et al., 2008
CNS CHANGES

Koppenhaver et al., 2015
### Table 2

*Pain, noxious sensitivity, and lumbar multifidus muscle thickness change after dry needling.*

<table>
<thead>
<tr>
<th>Improvement (n = 25)</th>
<th>Baseline</th>
<th>Immediately after dry needling</th>
<th>1 week After dry needling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numeric Pain Rating Scale</td>
<td>4.7 ± 1.9</td>
<td>2.7 ± 2.3**</td>
<td>1.5 ± 1.4**</td>
</tr>
<tr>
<td>Pressure pain threshold (N/cm²)</td>
<td>6.7 ± 3.5</td>
<td>7.4 ± 3.5**</td>
<td>8.5 ± 3.6**</td>
</tr>
<tr>
<td>Resting LM thickness (mm)</td>
<td>32.4 ± 0.61</td>
<td>32.3 ± 6.3</td>
<td>32.3 ± 7.3</td>
</tr>
<tr>
<td>Contracted LM thickness</td>
<td>34.8 ± 6.7</td>
<td>34.5 ± 6.5</td>
<td>35.3 ± 7.3</td>
</tr>
<tr>
<td>Percent LM thickness change (as a percentage of rest)</td>
<td>7.3% ± 9.2%</td>
<td>6.8% ± 9.3%*</td>
<td>9.2% ± 10.9%*</td>
</tr>
<tr>
<td>Increase in Pressure Pain Threshold relative to baseline</td>
<td>10.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in % LM thickness change relative to baseline</td>
<td>−6.9%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Baseline: 26.9%                                           |                  | 26.0%                          |                            |
Needle Insertion

Local Microtrauma/ Mechanical Stimulation

LTR

Release of SP and CGRP

Increase in blood flow, decrease in SEA, decrease in pain

Cagnie et al., 2013
CONTRAINDICATIONS

- Post-surgical
- Inadequate practical knowledge
- 1st trimester of pregnancy
- Uncontrolled anticoagulant usage
- Compromised immune system
- Local infection or active tumor
- History of lymph node removal
- Respiratory illness
POTENTIAL COMPLICATIONS

**Common (1-10%)**
- Needle insertion pain
- Muscle soreness
- Fatigue
- Bruising

**Uncommon (.1-1%)**
- Aggravation of symptoms
- Feeling faint or dizzy
- Stuck or bent needle
- Headache
POTENTIAL COMPLICATIONS CONT.

Rare/Very Rare (0.01-0.1%)
- Infection
- Pneumothorax

Other (<0.01%)
- Vasovagal response
- Fainting
- Forgotten needle
- Broken needle
- Nausea/Vomiting
- Emotional Response (anxiety, euphoria)
CONCLUSION

• Risk versus reward
• Can be safe and effective
• More research needed for DN

ONE DOES NOT SIMPLY
STICK A NEEDLE ANYWHERE
REFERENCES

- Hseih YL, Yang SA, Yang CC, Chou LW. Dry needling at myofascial trigger spots of rabbit skeletal muscles modulates the biochemicals associated with pain, inflammation, and hypoxia. *Evid Based Complement Alternat Med.* 2012; 1-12.
REFERENCES

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  • http://jomurphey.blogspot.com/2015/04/sunday-stroke-survival-dry-needling-new.html
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“The human system is so wondrously designed that a lifetime of study only leaves one in awe and humbled by how little we truly understand about its function. The intricate interrelationships between structure and function, muscles and motor control, perception and reactions, the skeletal system and fascia provide foundations through which our activities occur. The process of pain and dysfunction often reside in the interruption of these dynamic systems... We evaluate through trained skills of observation of form and motion, palpation to determine condition, and resistance to explore neuromuscular control. Then through treatment we improve the interplay of motor control, structure, and functional capacity to enhance the quality of life of those we serve.”

Gregory S. Johnson, PT, FFCFMT