Integrative medicine: Low Back Pain

By:
Alexander Filipski DO
Kaushal Nanavati MD
Case Presentation:

**T.T.:** 47 yo Female, with complaints of acute on chronic low back pain (LBP).

- Pt states she has a three month history of LBP worsening over past several days.
  - Rated: 8/10
  - Localized: lower lumbar region
  - Radiation: Mid-back and left hip
  - Described as throbbing, stabbing, and shooting. It is persistent and unrelenting
  - Worsened: changing position or standing.
  - Improved only by prescription Tramadol. No improvement with Motrin/Tylenol/Heating pad/Flexeril.
  - Timing: is all the time.
Associated symptoms:

- Decreased mobility, limping, spasms, tenderness to touch, and weakness in lumbar region.
- Not associated with:
  - Bladder changes, bowel changes, tingling, numbness, rash, loss of balance, weight loss, weight gain, diarrhea, abdominal pain, bowel movements,
Pertinent history:

- Dental caries (frequent infections/multiple extractions)
- Anxiety
- Severe gastritis (Hospitalization)
- Panic Attacks
- MRSA infections
- Ectopic pregnancy
Physical Exam:

- Hypertonic, spasming of para-spinal muscles within lumbar spine - lower thoracic spine worse on the left side.
- DTR intact 2+ B/L
- Sensation grossly intact B/L LE
- Absence of spinous process tenderness from T5-L5/Sacrum.
- Pedal pulses intact
- Gait is normal.
- Posture is slumped over with elbows resting on knees.
What are your next steps??

• Radiological imaging?
• Continue with narcotic pain management?
• Refer to pain management for injections?
• Physical therapy?
• Chiropractor?
• Other modalities?
Hip films
Low back films
Thoracic films:
Thoracic Films:
Further work up included imaging:

Xray of:
  - Left hip: Normal findings
  - Lumbar Spine: No significant disc narrowing, arthritis, or acute changes
  - Thoracic spine: Mild scoliosis, minimal degenerative changes
Conventional modalities:

Self-care for all!
  
  - Systematic review of randomized trials: bed rest did not improve either function or pain, compared to usual activity in patients with sciatica.
  
  - Advising patient to remain active was as effective as standard physical therapy for improved function.
A good mattress goes a long way:

- A medium-firm mattress in a European randomized trial demonstrated a higher likelihood to experience overall disability improvement compared to a firm mattress at 90 days.
Conventional modalities:

Å Pharmacological therapies:
  ï First-line therapy:
    Å NSAIDs/APAP (ACoP, APS recommendations)
    Å Use of NSAIDs and Tylenol has decreased amongst
      24,000 person study: 37 to 29%; narcotics increased
      from 19 to 29%
  ï Opioids:
    Å Only appropriate in the short term therapy for acute
      severe exacerbations.
    Å No research to look at adverse effects associated with
      long term therapy (including addiction and substance
      abuse)
Conventional modalities

Pharmacology continued:

- **Anti-depressants:**
  - Short-term therapy (8 weeks or less) vs placebo have only lead to conflicting results in several meta-analyses while long term results are yet to be available.
  - The only SSRI study to demonstrate small benefits is a Cymbalta (sponsored by the Drug manufacturer.)

- **Skeletal muscle relaxants:**
  - In general, there is insufficient evidence in therapy for sub-acute to chronic back pain with a higher risk of central nervous side effects.

- **Benzos:**
  - Clinically only effective for the acute severe exacerbation and benefits only shown with tetrazepam. (Not aval. In US)
Integrative modalities:

Â The use of acupuncture for Acute/Chronic low back pain.

Â Hypothesized MOA:

Â Classical theory: Meridian points with the body's vital energy circulating just below the surface. Secondly, the bodies ñyinò and ñyang.ò
RIGHT FOOT

LEFT FOOT
Acupuncture

Medical theory:
- Medical theory: Body's specific tender points. At these points, the sensory input (i.e. LBP) is inhibited.

- Diffuse noxious inhibitory control (DNIC) implies that acupuncture stimulates production of endorphins, serotonin, and acetycholine in the CNS, enhancing analgesia.
Diffuse Noxious inhibitory control:

Facilitation:
- Substance P
- Glutamate and excitatory amino acids
- Serotonin (5HT_{2a,3a})
- Nerve growth factor

Inhibition:
- Descending antinociceptive pathways
  - Norepinephrine-serotonin (5HT_{1a,b}), dopamine
  - Opioids
  - GABA
  - Cannabinoids
Acupuncture conf.:  

Mauritis W. van Tulder et al.:  

- 11 RCTs on acupuncture for nonspecific LBP  
  - Inclusion criteria in their article.  
    - Three compared acupuncture to nothing  
    - Two compared to conventional therapy  
    - Eight compared to placebo or sham therapy  
    - Range: acute to chronic low back pain.
Acupuncture results:

Issues include: selection bias, blinding, varying use of acupuncture, and follow up.

Of the 11 studies only two met criteria for high quality studies.

Findings:

- No evidence to show that acupuncture is more effective than no treatment.
- Moderate evidence to show that it is no more effective than trigger point injections or TENS units.
- Lastly, limited evidence for the use of acupuncture compared to sham or placebo.
Osteopathic manipulation:

Å Definition: full body system of hands-on techniques to alleviate pain, restore function, and promote healthy and well-being.

Å Somatic dysfunctions (TART: Tissue texture changes, asymmetry, restrictions, and tenderness) are found with hand palpation.

   ï Applied forces whether passive or active are used in order to reset homeostasis.
Somatic dysfunction: proprioceptive and nociceptive components

Increased gain of stretch receptors
Why?
Unexpected movements with excessive reflex activation of muscles?

Increased spindle sensitivity

Increased gamma efferent activity

Facilitation in spinal cord

Pain
Why?
Many causes, including trauma

Guarding

Hyperactive muscles –
- Tissue texture change
- Restriction of motion from resistance of muscles to lengthening
- Asymmetry

Locally compromised circulation, including lymphatics, in region of hyperactive muscle
- Edema (Tissue texture change)
- Ischemia (Tenderness and pain)
Techniques used:

HVLA, myofascial release, LVLA, soft tissue stretching, Chapman's points, muscle energy, counterstrain, and lymphatic pumps.
Similar to meridian points, Chapman points correlate specifically with a organ or segment of organ within the body and are palpable "pea sized" nodules within the fascia.
Osteopathic Manipulation and research

Recent studies have demonstrated some improved outcomes, however, there is limited patient population, difficulty with blinding studies, and often poor follow-up.
The first everé

Å des Anges Cruser et.al.

Å Randomized control trial of OMT for acute low back pain OMT vs UCO (usual care offered)

- Guidelines: UCO
  - Advice that most episodes resolve uneventfully in 6 weeks. Encourage full activities.
  - Prescribe a muscle relaxant or opioid for up to one week.
  - Passive modalities: Ice/heat
Questionnaire's used:

**RMDQ:**
- I stay at home most of the time because of my back.
- I change position frequently to try and get my back comfortable.
- I walk more slowly than usual because of my back.
- Because of my back I am not doing any of the jobs that I usually do around the house.
- Because of my back, I use a handrail to get upstairs.
- Because of my back, I lie down to rest more often.
- Because of my back, I have to hold on to something to get out of an easy chair.
- Because of my back, I try to get other people to do things for me.
- I get dressed more slowly than usual because of my back.
- I only stand for short periods of time because of my back.
- Because of my back, I try not to bend or kneel down.
- I find it difficult to get out of a chair because of my back.
- My back is painful almost all the time.
- I find it difficult to turn over in bed because of my back.
- My appetite is not very good because of my back pain.
- I have trouble putting on my socks (or stockings) because of the pain in my back.
- I only walk short distances because of my back.
- I sleep less well because of my back.
- Because of my back pain, I get dressed with help from someone else.
- I sit down for most of the day because of my back.
- I avoid heavy jobs around the house because of my back.
- Because of my back pain, I am more irritable and bad tempered with people than usual.
- Because of my back, I go upstairs more slowly than usual.
- I stay in bed most of the time because of my back.

**QVAR:**

[Image of the QVAR form]
Techniques applied in this study:

ASSESSMENT OF SOMATIC DYSFUNCTION: VISUAL AND PALPATORY

Positional Asymmetry, Tissue texture abnormalities, Restricted motion, Tenderness

1) Pelvic mobility and landmark asymmetry
   - Standing flexion test
   - Assessment of pelvic and lower extremity landmarks

2) Tenderpoint screening
   - Psoas tenderpoint screening in the iliac fossa medial to the ASIS
   - Quadratus lumborum: tenderpoint screening along the belly of the muscle between the 12th rib and the iliac crest
   - Piriformis in the belly of the muscle that is medial to and slightly cephalad to the greater trochanter

3) Lumbar segmental dysfunction
   - Segmental motion testing:
     - Large muscle group: the large muscles of the low back were assessed by palpation for tenderness and hyperemicity

OMT Techniques Used

Soft Tissue- Lateral stretching, linear stretching, deep pressure, and traction forces are manually applied to the muscles and fascia while monitoring for tissue response.

Myofascial release- Manual forces are applied to myofascial structures in an indirect, direct or combined fashion, in a manner used to release tension.

Counterstrain- A myofascial tenderpoint is contacted, and the body is gently positioned to a point of minimal tension around the point until the patient reports a significant decrease in tenderness, position is held for approximately 90 seconds and then the patient is gently returned to a resting position.

Muscle energy- The patient is positioned directly into the barrier, and provides an isometric muscular contraction against the provider's resistance for approximately 3 to 5 seconds. As the patient relaxes the muscular contraction the provider moves the patient into a new restrictive barrier.

Sacro-iliac articulation- The region of somatic dysfunction is gently guided into a restrictive barrier by using the long axis of the femur to move the ilia on the sacrum by circumducting the femur in the acetabulum while attempting to gently overcome the restriction with traction or compression.

High-velocity, low amplitude (HVLA) - With all planes of motion of the joint engaged toward the restrictive barrier a high velocity/low amplitude force is applied to overcome the restrictive barrier.
Results:

By using QVAS, RMDQ, and ANOVA scoring scales to assess pain:

- 76.7% of the OMT group reported clinically meaningful reductions in "Pain at best" compared to 43.3% of the UCO group. However, all other QVAS pain measures offered no difference.
- RMDQ demonstrated lesser "pain now" and "typical pain" scores compared to the UCO.
- Overall satisfaction was greater for the OMT group compared to the UCO group. (P < 0.01)
- At primary end-point, 76% of soldiers in OMT group reported that their pain was better or completely gone compared to 20% of the UCO group.
<table>
<thead>
<tr>
<th>Statement</th>
<th>OMT ($n=30$)</th>
<th>UCO ($n=30$)</th>
<th>Difference (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe manipulation with standard care will help my low back pain</td>
<td>3.77 (0.73)</td>
<td>4.03 (0.62)</td>
<td>-0.27 (-0.62 to 0.08)</td>
</tr>
<tr>
<td>I believe that standard care alone will help my low back pain</td>
<td>2.80 (0.85)</td>
<td>3.20 (0.93)</td>
<td>-0.40 (-0.86 to 0.06)</td>
</tr>
<tr>
<td>I believe that manipulation plus standard care will improve my level of functioning</td>
<td>3.73 (0.83)</td>
<td>4.03 (0.56)</td>
<td>-0.30 (-0.67 to 0.07)</td>
</tr>
<tr>
<td>I believe that standard care alone will improve my level of functioning</td>
<td>2.93 (0.87)</td>
<td>3.33 (0.96)</td>
<td>-0.40 (-0.87 to 0.07)</td>
</tr>
</tbody>
</table>

Note: OMT=osteopathic manipulative treatment group; UCO=usual care only group.
*Represents the difference tested using independent samples t-tests.

<table>
<thead>
<tr>
<th>Measure</th>
<th>OMT ($n=30$)</th>
<th>UCO ($n=30$)</th>
<th>Difference (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient satisfaction</td>
<td>8.74 (1.71)</td>
<td>5.81 (2.74)</td>
<td>2.93 (1.75 to 4.12)</td>
</tr>
<tr>
<td>Self-reported overall improvement</td>
<td>5.96 (1.33)</td>
<td>4.65 (1.39)</td>
<td>1.31 (0.61 to 2.01)</td>
</tr>
</tbody>
</table>

Note: OMT=osteopathic manipulative treatment group; UCO=usual care only group.
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Draw backs:

Done in active duty population:

- RDMQ demonstrates questions such as “I sit down for most of the day because of my back” which is not possible in active duty.

- The general public tended to score better on RMDQ questionnaire's about return to function.

  Implication: may have better outcomes in the general public
Massage therapy:

- Massaging a particular area stimulates large Gate-control theory:
  - Large diameter nerve fibers
  - Initiates inhibitory input onto T-cells
  - T-cells are depressed allowing for nociceptive fibers having excitatory effect (causes pain relief)
Massage for Low Back Pain

Andrea D. Furlan et al.

13 trials: Patients with nonspecific low back pain differing in type of pain, duration of pain, previous treatments, and distributions of age.

- Further variability included duration, and frequency of therapy varied.
- Comparisons to sham, placebo, various techniques of massage, and other forms of activity.
Results:

Compared to previous 9 trial study, there are findings suggestive of treating patients with sub-acute to chronic low back pain combined with exercise.

- Costs in mind, long term it is cheaper and has improving function and general pain based on the RMDQ up to at least one year.

Systemic review struggled with generalizing their findings due to such wide variability's between studies.
Summary:

1. Conventional modalities combined with integrative modalities demonstrated overall improvement in LBP especially in sub-acute/chronic population.

2. OMT in acute back pain demonstrated better: Pain at best, and overall end-point pain/pain at best/typical pain in RMDQ.

3. Acupuncture demonstrated minimal improvement based upon studies. Further studies needed.

4. Massage therapy combined with exercise/physical therapy has good outcomes in those who can afford it.

5. Higher patient satisfaction with healthy among OMT groups.
References:


- Knight, Christopher et al. "Treatment of acute low back pain." *UpToDate*. 2013. Website

