CERVICAL RADICULOPATHY

Radiculopathy is differentiated from radicular pain:
- Radiculopathy is a neurological state in which conduction is blocked along a spinal nerve or its roots => muscle weakness & sensory changes
- Radiculopathy and radicular pain commonly occur together,
- Pain in patients with a CR might have a neuropathic pain component! > no beneficial effect or biological (warning) advantage (Treede, 2008)

RADICULAR PAIN

Pain perceived as arising in a limb or the trunk wall caused by ectopic activation of nociceptive afferent fibers in a spinal nerve or its roots or other neuropathic mechanisms. (IASP taxonomy)

Interesting group of patients with neck pain

Triage in Patients with Neck Pain (adapted from Waddell, 1998)

Specific 5-15%
- "serious"

Non-specific 85-95%
- "non-serious"

Assessment aims to find relevant dysfunctions, able to explain complaints

SYSTEMATIC REVIEW:

EFFECTIVENESS OF CONSERVATIVE TREATMENT FOR PATIENTS WITH CERVICAL RADICULOPATHY

CLIN J PAIN, 2013

E J THOONEN, GGM SCHOLEN-PEETERS, BM KOES, D FALLA, AP VERHAGEN
AIM:
To assess the effectiveness of conservative treatments for patients with CR.

Why?
• Surgery not more effective
  - Cochrane 2010; Peolsson, 2012; Enquist, 2013
• 29% 2nd operation adjacent segment < 1 yr.
  - Bono, 2010; van Middelkoop, 2013

INTERVENTIONS & COMPARISONS

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Comparison</th>
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<th>Author</th>
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<tbody>
<tr>
<td>Collar</td>
<td>Traction</td>
<td>Sham Traction</td>
<td>Placebo</td>
<td>BAPM 1996</td>
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<tr>
<td>Collar</td>
<td>PT</td>
<td>Surgery</td>
<td></td>
<td>Persson 1997</td>
</tr>
<tr>
<td>Collar</td>
<td>PT</td>
<td>Wait &amp; See</td>
<td></td>
<td>Kuijper 2009</td>
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<tr>
<td>Collar</td>
<td>Injections</td>
<td></td>
<td></td>
<td>Fukusaki 1995</td>
</tr>
<tr>
<td>Traction</td>
<td>Placebo</td>
<td>Traction</td>
<td>Kober-Moher 1990, Shaker 2002</td>
<td></td>
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<tr>
<td>Intermittent</td>
<td>Continuous Traction</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Traction</td>
<td>MT + Exercise</td>
<td>MT + Exercise</td>
<td></td>
<td>Ragonese 2009</td>
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</table>

RESULTS

Low level evidence
that a collar and physiotherapy are (equally) effective on disability at short term follow up only. (and more effective than wait & see or surgery)
  • < 3 & 6 wk: Kuijper 2009; < 12 wk Persson 1997, re Surgery
that intermittent traction is no more effective than continuous traction.

Very low level evidence
• that traction is no more effective than placebo traction.
• that a collar is no more effective than traction. (long term follow up)

DUTCH MANUAL THERAPY GUIDELINE

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Effectiveness</th>
<th>Level of evidence</th>
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<tbody>
<tr>
<td>Cervical manipulation</td>
<td>Short term (&lt; 1 wk) more effective than NSAIDs on pain</td>
<td>Low level; 1 RCT with low RoB (Howe, 1983)</td>
</tr>
<tr>
<td>Thoracic manipulation</td>
<td>Unknown</td>
<td>No RCTs found</td>
</tr>
<tr>
<td>Cervical mobilisations</td>
<td>Short term (&lt; 1 wk) more effective than placebo or wait &amp; see on pain and ROM</td>
<td>Very low level; 1 RCT with high RoB (Brodin, 1984)</td>
</tr>
<tr>
<td>Thoracic mobilisations</td>
<td>Unknown</td>
<td>No RCTs found</td>
</tr>
<tr>
<td>Cervical mobilisation with neurodynamic intent</td>
<td>Direct positive effect on ULNT.</td>
<td>Low level; 1 RCT with low RoB (Coppieters, 2003)</td>
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<tr>
<td>Cervico-thoracic mobilisation &amp; motor control exercises</td>
<td>Short term (&lt;4 wk) more effective than separate intervention alone or wait &amp; see on pain and disability</td>
<td>Low level; 1 RCT, low RoB (Langevin, 2015) and 1 RCT high RoB (Ragonese, 2009)</td>
</tr>
<tr>
<td>Multimodal intervention with neurodynamic intent</td>
<td>Short term (&lt;4 wk) more effective than wait &amp; see on pain, disability and OPE</td>
<td>Low level; 1 RCT, low RoB (Nee, 2012)</td>
</tr>
<tr>
<td>Multimodal intervention with combined intent (neurodynamic, joint, muscle)</td>
<td>Short term (&lt;4 wk) more effective on pain</td>
<td>Low level; 1 RCT, high RoB (Ragonese, 2009; Allison, 2002)</td>
</tr>
<tr>
<td>Traction combined with cervical mobilisation, thoracic manipulation and exercise</td>
<td>Short term (&lt;4 wk) no difference between traction - placebo traction</td>
<td>Low level; 1 RCT, low RoB (Young, 2009)</td>
</tr>
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</table>
CONCLUSION

There is a lack of high quality RCTs.
- Based on low to very low level evidence, no one single intervention appears to be superior or consistently more effective than other interventions.

PROMISING?

One low risk of bias study indicated that at 3 week follow up, a collar is more effective on neck pain and disability than physiotherapy and a wait & see policy. At the 6 week follow up, both a collar and physiotherapy are more effective on neck and arm pain than a wait and see policy (Kuijper, 2009).

MULTI-MODAL THERAPY NOT WELL RESEARCHED AS YET, BUT MIGHT PROVE PREFERENTIAL
(Moore & Jull, 2006; Hurwitz, 2008; Hodges, 2013)

PROMISING?

Seems logical, considering patho-physiology?

IMPLICATION FOR PRACTICE

Effectiveness of use of a collar or physiotherapy at short term follow up (<3 wks) seems promising compared to a wait & see policy.
- PT should consist of multimodal interventions:
  - Spinal Mobilisation
  - Neurodynamic Mobilisation
  - Motor Control Exercises

Regardless of the intervention assignment, patients seem to improve over time (~6 months), indicating a favourable natural course.

OKAY, SO NOW WHAT?

PLAN AHEAD AFTER HISTORY TAKING:
? WHAT WOULD YOU EXPECT TO FIND?
ASSESS FOR THESE SIGNS & SYMPTOMS
DON’T TREAT THE PATHOLOGY; TREAT THE PATIENT

COMBINING CLINICAL EXPERIENCE & CONTEMPORARY RESEARCH, IT WOULD MAKE SENSE THAT:

Multimodal therapy might be more effective.
(Moore & Jull, 2006; Gielant, 2007; Hurwitz, 2008; Forbush, 2011; Boyles, 2011; Salt, 2011; Hodges, 2013)

The kind of treatment of a radiculopathy should depend on the stage it is in:
- a more hands-off pharmaceutical approach in the acute inflammation stage,
- turning into a more active multi-modal approach aimed at the functional restoration of the ensuing physiological changes.
ACUTE STAGE (<6 WEEKS)

- EXPLAIN & focused advice
- Relative rest; NO symptom provocation
  * Contrary to guidelines Non-specific Neck Pain
- EFFECTIVE early pain management
  * NSAIDs – inflammation (Ibuprofen, Naproxen)
  * Opioids – nerve / neuropathic pain? (Oxycodone)
- Soft collar (turned backwards?..)
  * (Kuijper, 2009)
- Hands-off; initially...
  * Neuro-mechanosensitivity?
  * (Coppieters, 2003; Nee, 2012)

EXPLAIN:

- DNA LANDS

Deep Neck Flexors
- Pain inhibition
  * Falia, Jull, O’Leary, Cagnie, ...
  * (RCTs: Cleland 2007; Frohbus 2011)

Neuro-mechanosensitivity
- Neurodynamic Openers & Sliders (Shacklock, Coppieters, Nee)
- "Unfolding" of nerve & root (Dilley; Ellis 2008, 2012)

MOTOR CONTROL IMPAIRMENT

Deep Neck Flexors & Extensors
- Control of inner range of flexion
- Control of inner range of extension
- Control of outer range of extension
- Integrate into function (ADL)

NERVE SLIDERS VS. TENSIONERS

Offloading positions

Sliders
- Unfolding
- Inner range of movement

Tensioners
- Elongation
- Outer range of movement > EOR

Stump
- Pre-tensioning → Unfolding phase
- How much?
  * Coppieters; Dilley; Greening; Ellis

Gentle mobilisation cervical spine
- Miller 2010, Gross 2010

Manipulation Thoracic Spine
- Cleland 2004; Gonzalez-Iglesias 2009

Axio-scapular muscles
LONG TERM MANAGEMENT
Driven by:
Patient Specific Functional Complaints (PSFS)
Limitations in Activities and Participation (NDI)

EVIDENCE BASED CLINICAL REASONING
General development in Physical Therapy:
from tissue-based diagnostics
to functional diagnosis

Sackett, 2000