Content

- Background of Low Back Pain (LBP) and movement control impairment (MCI)
- Can we examine MCI reliably?
- Is changed MCI a feature of CLBP?
- Does it correlate to distorted body image in the brain?
- Can we treat it?

Movement control impairment as a sub-group of non specific Low Back Pain (NSLBP)

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Low Back Pain (LBP)

- Up to 80% of people have it at least once in life
- 1-year prevalence up to 50%
- Structures explain only a part of the pain
- Acute LBP cures by itself within 4 weeks – no matter what you do
- However, up to 70% of these persons get LBP again within a year...
- Chronic LBP is the second most costly sickness for the western societies (after depression)
- What to do?

But; is 90% really non-specific?

Need to sub classify

- ... And this has been decared to be the most important issue for LBP Research...

Classification of LBP

(O’Sullivan 2005)

Specific LBP (5-10%)
- Clear medical conditions:
  - Fractures
  - Tumours
  - Anomalies
  - New root affections
  - Spinalinal stenosis

Non Specific LBP (90%)
- Mechanical
- Non mechanical (30%)

Movement Control impairment (30%)

- Directional
- Hypomobility and pain

Central sensitivity
- Yellow Flags
  - Psychosocial Factors
  - Fear avoidance
  - Catastrophization

Results: 7 trials were included. For long term effects after an acute episode of LBP, SSE in comparison to reducing exercises is more effective than a minimal intervention and may be as effective as other physiotherapeutic treatments in reducing pain and disability. Equal improvement in both groups was observed in the first 6 months, but there was a minor difference concerning reduced LBP. Conclusion: For LBP, SSE is more effective than a minimal intervention, but it is not more effective than other physiotherapeutic interventions.

Rackwitz et al 2006: Results: Seven trials were included. For people with back pain, segmental stabilizing exercises are in the short and long term, more effective than SSE intervention and may be as effective as other physiotherapeutic treatments in reducing disability and pain. There is that segmental stabilizing exercises additively to other interventions to reduce pain and disability more than single segmental stabilizing exercises alone.
Background

- In many cases, chronic pain patients move awkwardly
- Or they have a bad movement control
- Their body scheme seems to be lost

Why?

What to do?

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Lillehammer
march 2011

Movement control is an important part of motor control

Some keywords (synonyms?):
- Relative flexibility (Sahrmann 2002);
- Functional stability (Comerford & Motram 2000);
- Maladaptive movement and motor control impairment (O'Sullivan 2000, 2005);
- Clinical instability (Panjabi 1992)

But... Let's name it by its own name...

Can we assess movement control?

- Cook 2005; Delphi study; 188 OMT therapists estimated the main features of clinical instability. 88 % regarded findings in the active movement control as a main finding
- Tests have been developed (Sahrmann 2002; O'Sullivan 2000; Comerford & Motram 2001)
- Dankaerts & O'Sullivan 2005; Reliability for whole subj. And phys. Assessment (k=0.95; N=35)
- Van Dillen 1998; 28 items, 4 „Specialists", N= 138 (k= 0.5 – 0.8)
- White & Thomas 2002 (N=40) kappa = 0.2 – 0.6
- Murphy et al 2006 N=40; vain PKB k=0.74

Study I
THE INTRA- AND INTERTESTER RELIABILITY OF MOVEMENT CONTROL TESTS OF THE LUMBAR SPINE
Luomajoki et al 2007; Reliability of movement control tests in the lumbar spine. BMC Musculoskeletal Disorders 2007, 8:90

- 40 Patients with and without LBP were videoed performing a set of 10 movement control tests
- 4 blinded Physios rated the tests
- Kappa values were calculated for inter- and intrarater reliability
- 6 of the tests were valued as reliable

Conclusion: Physiotherapists can reliably rate the movement control test battery of six tests (K>0.6)

The 6 tests

1. Waist's bow
2. Pelvic tilt
3. Sitting knee extension
4. One leg stance
5. Prone knee bend
Videos of Testbattery;
Correct (test Negative)
and not Correct (test Positive)

Tests correct

Flexion Control impairment

Extension Control Impairment

Rotation Control Impairment
Patients were measured on two different days in their ability to control their movements of the back.

Analysis: Intraclass Correlation Coefficients (ICC 1.1) of test retest measures; point values, means and confidence intervals of lumbar movements for test retest results were calculated. Bland Altman plots for limits of agreement between mean values and mean differences between days were calculated as well. ICC > 0.70 were considered satisfactory.

Results & Conclusions:
Within the SDD boundaries of this study, 93% of the subjects performed the same on both days in SKE and 90% in PKB. There were no significant differences between patients with LBP and healthy controls in the day to day reproducibility of the movement control tests. These two tests seem to have an acceptable level of stability and can therefore be recommended for clinical use to test the movement control ability in the low back.

Results

<table>
<thead>
<tr>
<th></th>
<th>LBP</th>
<th>Healthy controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean scores</td>
<td>2.21 (SD 1.44)</td>
<td>0.75 (SD 1.03)</td>
</tr>
<tr>
<td>Difference of the mean scores</td>
<td>1.46</td>
<td></td>
</tr>
<tr>
<td>Mean SD</td>
<td>1.31</td>
<td></td>
</tr>
<tr>
<td>Effect Size (ES)</td>
<td>1.18</td>
<td></td>
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</tbody>
</table>

Discussion
- There is a high significant difference in the active movement control performance between patients with LBP and those without LBP.
- The results do not explain causality.
Study IV
Tactile acuity and lumbopelvic motor control in patients with back pain and healthy controls

Case controls study
N=90 (LBP= 44; healthy N=46)

Two Point Discrimination (TPD)
Low back Pain (LBP) and
Movement Control Tests (MCT)

Results

Study V
Improvement in low back movement control, decreased pain and disability, resulting from specific exercise intervention
Journal of Sport Medicine, Arthroscopy, Rehabilitation, Training and Technology SMARTT 2010
Hannu Luomajoki, Jan Kool, Bing D. de Bruin, Olavi Airaksinen

Can we treat movement control dysfunction?

Exercises for Flexion control

Roland Morris Questionnaire
Flexion control; Strengthening

Extension control

Extension control; Strengthening
Conclusions

- The inter-tester and intra-tester reliability of the active movement control tests of the low back is substantial.
- The reproducibility of these tests in day to day comparison is good.
- There is a clear and significant difference between patients with LBP compared to healthy controls in their movement control.
- Persons that have an increased TPD also have an impaired movement control of the low back. Distortion of the body scheme might explain why patients cannot control active movement of their back.
- Improvement of movement control through exercises leads to a decrease of LBP and improves functional disability due to back pain. However, as no control groups were included, no direct conclusions on the efficacy can be drawn.

What is the explanation of decreased MCT and increased TPD?
- Future directions

- Studies on Phantom pain on amputees
- And on CRPS
For the back...

- Visualize
- Recognize
- TPD training
- Graphaestesie
- Motor imagery
- Think on ideomotor training

... Studies are coming...

User References: