Intra and inter-session reliability of the angle between pain onset and submaximal pain during upper limb neurodynamics test 1

A study on healthy individuals

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Ciao!
Upper limb neurodynamics test 1 (ULNT1)

(Butler 2000)
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(Butler 2000)
Positivity of neurodynamics tests: 3 conditions

(Elvey 1997, Butler 2000, Nee 2012)

Patient’s typical complain

‘This is just my pain’

Different response between sympt- and asymptomatic side

‘To the left is more painful’

Symptom’s change following structural differentiation

‘If I move my head the pain increases’
Pain onset (PO)

(Oliver e Rushton 2010)

‘Ouch!’

‘The moment when the least experience of pain is recognized’
Submaximal pain (SP)

(Oliver e Rushton 2010)

‘Ouch!’

‘The moment when pain or tingling increases and the subject wants the test to be ceased’
Quantifying the mechanosensitivity: PO and SP angles of occurrence in range

(Coppieters 2002, Vanti 2010, Oliver 2011)

High intra-tester reliability
High intra-session reliability
BUT...
Few data on the inter-session reliability
Possible fault in patient positioning between different sessions

S.I.F. Congress, Milano 3-4 October 2015
The angle between PO and SP ($\Delta$)
Aim of the study

Investigate the intra- and inter-session reliability of the angle between pain onset and submaximal pain ($\Delta$)

Explore whether the intra- and inter-session reliability of $\Delta$ was higher compared to the reliability of PO and SP angles of occurrence
Materials and methods

44 healthy participants (27 females, 17 males)
Age 21.8 ± 2.3

Inclusion criteria: non painful and full active RoM of the upper quadrant’s joints
Exclusion criteria: recent or present upper quadrant pain, neurologic deseases, drugs or alcohol abuse, spine surgery, radiation therapy or chemotherapy in the past year

Wrist & hand splint, shoulder positioning device, electromagnetic goniometer
Intraclass Correlation Coefficient (ICC $_{3,1}$) and Bland-Altman plots
Procedures
Results: ICC values

<table>
<thead>
<tr>
<th></th>
<th>ICC (upper; lower bounds)</th>
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<tbody>
<tr>
<td></td>
<td>Δ</td>
</tr>
<tr>
<td>Intra-session</td>
<td>0.71 [0.47 : 0.85]</td>
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<tr>
<td>Inter-session</td>
<td>0.79 [0.60 : 0.89]</td>
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ICC interpretation criteria: 0.00-0.25: no correlation; 0.26-0.49: low correlation; 0.50-0.69: moderate correlation; 0.70-0.89: high correlation; 0.90-1.00: very high correlation (Munro 2005)
Results: Bland-Altman plots

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<tr>
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<th>Δ (°)</th>
<th>Pain Onset (°)</th>
<th>Submaximal Pain (°)</th>
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<tbody>
<tr>
<td>Intra-session</td>
<td><strong>2.3</strong> [-18.3 ; 23.1]</td>
<td>2.5 [-33.9 ; 28.8]</td>
<td>0.1 [-26.8 ; 26.5]</td>
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<tr>
<td>Inter-session</td>
<td><strong>2.8</strong> [-14.7 ; 20.4]</td>
<td>5.3 [-30.7 ; 19.9]</td>
<td>-2.5 [-29.2 ; 24.1]</td>
</tr>
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Discussion and conclusions

The intra- and inter-session reliability of the angle between PO and SP during the ULNT1 in healthy individuals:

- resulted high
- is higher compared to the reliability of PO and SP angles of occurrence

The $\Delta$ might be the preferable variable in the assessment of neural mechanosensitivity

Further research should test the $\Delta$ reliability in the clinical setting
Thanks for your attention...