Investigating Neck And Trunk Movement Variability During Single And Dual-Task Gait in People with Chronic Neck Pain

Feras Alsultan, De Nunzio A, Heneghan N.R, Rushton A, Falla D

Centre of Precision Rehabilitation for Spinal Pain (CPR Spine)
University of Birmingham, United Kingdom

@feras2007pt @CprSpine
Background

- Chronic Neck Pain (CNP) may lead to neuromuscular and biomechanical disturbances (Falla et al., 2017)
- Performance of two tasks at the same time (dual tasks) is typical of daily activities
- Quality of neck and trunk movement could provide insight into biomechanical changes occurring in people with CNP

Aim

- We investigated the variability of trunk and neck rotation during single and dual-task gait in people with CNP compared to healthy individuals
Methods

• An observational case-control study
• 20 healthy individuals
• 24 people with CNP of idiopathic or traumatic origin
• A 3D motion capture system was used to record data
• Reflective markers were placed on a helmet and the subject
  (Davis III et al., 1991)
Methods

- Participants walked in a straight line (3 meters)
  - With their head in a neutral position (single-task)
  - Whilst rotating their head continuously at a normal speed (dual-task)

- The averages of trunk and head rotation angles (degrees) were calculated across gait cycles for the task trials

- One-way analysis of variance (ANOVA) or Kruskal-Wallis H tests were used to evaluate variability
Results

- No group differences were observed for single-task gait trials.
- For dual-task gait, no significant difference found between groups for the variability of neck rotation.
- Participants with CNP showed reduced variability of trunk rotation.
- Slower speed during dual-task gait observed in CNP group.

* Statistically significant difference: *(p < 0.05)*

<table>
<thead>
<tr>
<th></th>
<th>Task</th>
<th>Group (Sig.)</th>
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</thead>
<tbody>
<tr>
<td>Variability of trunk rotation</td>
<td>Single</td>
<td>0.862</td>
</tr>
<tr>
<td></td>
<td>Dual</td>
<td>0.021*</td>
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<tr>
<td>Variability of neck rotation</td>
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<td>0.427</td>
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<tr>
<td></td>
<td>Dual</td>
<td>0.636</td>
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<tr>
<td>Gait speed</td>
<td>Single</td>
<td>0.407</td>
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<tr>
<td></td>
<td>Dual</td>
<td>0.043*</td>
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Discussion and Conclusion

• These results show less variability of trunk rotation in people with CNP as compared to healthy individuals when performing the more challenging task.
• These findings could be interpreted as evidence of a protective strategy when faced with a more challenging condition.

Implications

• The results of dual-task trials reveal changes in movement variability in people with CNP.
• These observations confirm of the importance of evaluating movement behaviour during functional tasks.
References
