HIP ADDUCTOR VS. HIP ABDUCTOR STRENGTH RATIO IN PATIENTS WITH LOW BACK PAIN

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Hip Abductor vs. Hip Adductor Strength Ratio Measurements in Patients with Low Back Pain

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BACKGROUND

- The World Health Organization reports low back pain (LBP) as one of the leading causes of disability in the world.1
  - 85% being nonspecific in nature or having no specific cause.2
- Studies show that researchers agree on the need for increased strength in the hip abductors in treating or preventing LBP.3-5
- Muscular strength ratios for patients with LBP have measured opposing musculature such as the back extensors and abdominals6, but not for the adductors and adductors.
- The adductors show increased strength to stabilize the femur following lower leg injuries to compensate for weak abductors.7-9
- No previous research shows a direct relationship between the strength of the hip adductor muscles and LBP.

PURPOSE

To identify hip strength ratios between the hip adductors and hip abductors in people with and without LBP.

MATERIALS & METHODS

Participants
- 30 participants (15 healthy, 15 LBP) volunteered.
- Between 18-35 years of age
- Completed an Oswestry Disability Index (ODI), a visual analogue scale, and the clinical predictor rules for LBP.

Exclusion Criteria
- Specific diagnosis resulting in LBP
- Previous surgeries to the back or lower extremity
- Pregnancy
- Score greater than 40% on the ODI

Inclusion Criteria
- Participants with non-specific LBP
- Between the ages of 18-40
- Between 20-40% on the ODI, >3 VAS, 3 out of the 4 criteria in the clinical predictor rules checklist.

PROCEDURES

1. Participants were allocated into control and LBP groups based on inclusion checklists.
2. Participant performed side-lying straight leg raise (SLR) for both legs, in both hip abductor and hip adduction.
   - Researcher instructed body positioning and the desired movement.
3. Hip abduction was measured at 30°, hip adduction was measured at 10°.
4. HHD was secured to the belt, participants performed SLR giving maximal effort for 5 seconds.
   - Performed 3 times for each muscle group on both legs.
5. The highest force output measurement was collected as maximum force production.
6. Strength ratio was calculated by Hip ABD/Hip ADD.

RESULTS

- One way ANOVA was not significant for differences between groups for strength ratios on either leg (p>.237)

<table>
<thead>
<tr>
<th></th>
<th>R Ratio</th>
<th>L Ratio</th>
<th>ODI</th>
<th>VAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LBP</td>
<td>1.6 ± 0.6</td>
<td>1.9 ± 0.5</td>
<td>22.3 ± 4.1</td>
<td>3.9 ± 0.8</td>
</tr>
<tr>
<td>Control</td>
<td>1.7 ± 0.6</td>
<td>1.6 ± 0.6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

DISCUSSION

- No significant differences between the LBP and control groups in hip strength
  - Limitations may be of age of population, level of disability, subjectivity of ODI and VAS, compensatory movements.
- Hip strength may not be a contributing factor to LBP or result in deficiencies from LBP.
- More research is needed to understand the relationship of muscle force around the hip and its influence on LBP.

CONCLUSIONS

- From this study, it would appear the hip abductor to hip adductor strength ratio is not different between people with and without LBP.
- It is unknown if deficiencies in hip strength exist in people with LBP.

REFERENCES