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Reactive strength index-modified in different plyometric tasks

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Reactive Strength Index-modified in different plyometric tasks

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Reactive Strength Index-modified in different plyometric tasks

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Purpose

Plyometric exercise training is thought to be essential for the development of the stretch-shortening cycle¹ and can therefore be used to improve performance measures such as vertical jump height².

Reactive Strength Index-modified (RSI$_{\text{mod}}$) is a reliable method of measuring an athlete’s explosiveness during plyometric exercises such as depth jumps and countermovement jumps¹.

The purpose of the research was to measure the between-limb differences in RSI$_{\text{mod}}$ across three plyometric tasks. The research also investigated differences in RSI$_{\text{mod}}$ between the three tasks for both limbs.

Method

Participants:

N=11, Recreationally-active, Age = 20.4 ± 1.5 years, Height = 1.74 ± 0.07 m, Body mass = 80.1 ± 12.9 kg.

Standardised warm-up on a cycle ergometer with jumping video-assisted protocol familiarisation.

Countermovement Jump (CMJ) • Hands placed on hips • Limbs on separate force platforms Stop Jump (SJ) • Three steps before jump • Land on both limbs • Limbs on separate force platforms Dominant Leg Jump (DLJ) • Unilateral stop jump • Three steps before jump • Land on dominant limb Non-dominant Leg Jump (NLJ) • Unilateral stop jump • Three steps before jump • Land on non-dominant limb

All jumps performed in a randomised order. Each jump repeated three times, and an average of each jump was used.

Results

- No significant difference in RSI$_{\text{mod}}$ between limbs in any of the jumps (p>0.05).
- For the dominant limb, RSI$_{\text{mod}}$ was significantly greater in SJ than CMJ (p=0.002, d=1.75) and the DLJ (p<0.001, d=1.74).
- For the non-dominant limb, RSI$_{\text{mod}}$ was significantly greater in SJ than CMJ (p<0.001, d=1.66) and the NLJ (p<0.001, d=1.67).

<table>
<thead>
<tr>
<th></th>
<th>CMJ</th>
<th>Stop Jump</th>
<th>DLJ vs. NLJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant</td>
<td>0.52±0.10b</td>
<td>0.83±0.23ac</td>
<td>0.52±0.12b</td>
</tr>
<tr>
<td>Non-Dominant</td>
<td>0.52±0.11b</td>
<td>0.84±0.25ac</td>
<td>0.49±0.16b</td>
</tr>
<tr>
<td>Between-limb</td>
<td>0.02</td>
<td>0.02</td>
<td>0.14</td>
</tr>
<tr>
<td>Cohen’s d</td>
<td>Trivial</td>
<td>Trivial</td>
<td>Small</td>
</tr>
</tbody>
</table>

References


Conclusion

- SJ is a more explosive type of movement, and coaches may want to make use of this form of plyometric task when looking to enhance performance variable such as speed and power.
- As no between-limb differences were found, coaches and researchers probably should not use RSI$_{\text{mod}}$ as a measure of limb asymmetry.
- Lower RSI$_{\text{mod}}$ in single-limb tasks shows participants were less able to produce similar forces over similar contact times.
- Future studies should measure RSI$_{\text{mod}}$ in athletes of different sporting activities, such as team sports vs. individual sports, as well as to establish whether RSI$_{\text{mod}}$ limb asymmetries exist in males and females separately.

Acknowledgements

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Author

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