Feet training in young elite handball players: a step forward?

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Aim. The aim of the present study was to examine the effect of a specific feet training program on acceleration, change of direction speed, jumping abilities and high-intensity intermittent performance (including CODs) in young elite handball players.

Methods

Athletes. Twenty seven elite adolescents handball players (14 girls, 13 boys; 15.5±1.1 y; 69.8±9.4 kg; 1.75±0.1 m; 10 h.week-1 +1 game) representative of an elite regional center in France participated in the study. These data arose as a condition of player monitoring in which player activities are routinely measured over the course of the competitive season; therefore, ethics committee clearance was not required. The study conformed nevertheless to the recommendations of the Declaration of Helsinki.

Design. Pre-post parallel group trial. Players were assigned to either a Feet (Feet; n=15) or a Core (C; n=12) training group. During 13 weeks, Feet consisted in 30-45 min/week (mainly Tuesday or Thursday afternoon) of specific feet drills including proprioception exercises, barefoot walking (on the inside, outside, toes up, on the heels, etc.), plyometric jumps (hopping, knees kept in extension, light additional weight or not, Table 1) and few key static stretches of calf and foot arch muscles (9); Core consisted of non feet-specific tasks over the same duration (e.g., core training, upper-body strength training). Except for the specific feet or core sequences, groups maintained similar external training programs.

Methodology. Before and after the training interventions, physical performance was assessed by a 10-m sprint time (10m) and an agility test (T-test) (Wireless Timing-Radio Controlled, Brower Timing System, Colorado, USA), a counter movement jump (CMJ, Ergojump, Globus Italia, Codogne, Italy), a hopping test (6 repeated jumps) from which average jumping height, leg stiffness (K) (10) and jump technique on a 3-points scale (0: bad, 3: excellent [body straight and toes up during flying time]) were examined, and the 30-15 Intermittent Fitness test (11).

Results

All between-group differences in the changes were either trivial or unclear (Figure 1).

Discussion

Results showed that performing the present feet-specific training, in addition to usual training commitments, failed to substantially improve acceleration, jumping performance, COD speed and high-intensity intermittent running performance in-
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Table 1. Training program for the Feet group.

<table>
<thead>
<tr>
<th>Week</th>
<th>Main Hopping exercise</th>
<th>Reps</th>
<th>Series</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>2-legs, hands free</td>
<td>8</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>S2</td>
<td>2-legs, hands on hip</td>
<td>8</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>S3</td>
<td>2-legs, hands on hip</td>
<td>12</td>
<td>4</td>
<td>48</td>
</tr>
<tr>
<td>S4</td>
<td>2-legs, 15-kg barbell on shoulder</td>
<td>8</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>S5</td>
<td>2-legs, 15-kg barbell on shoulder</td>
<td>8</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>S6</td>
<td>Week off (school holidays)</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S7</td>
<td>Jump Rope (jogging)</td>
<td>20 s</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>S8</td>
<td>2-legs, hands on hip</td>
<td>14</td>
<td>4</td>
<td>56</td>
</tr>
<tr>
<td>S9</td>
<td>2-legs, hands on hip</td>
<td>16</td>
<td>4</td>
<td>64</td>
</tr>
<tr>
<td>S10</td>
<td>2-legs, 15-kg barbell on shoulder</td>
<td>10</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>S11</td>
<td>1-leg, hands on hip</td>
<td>10</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>S12</td>
<td>1-leg, 15-kg barbell on shoulder</td>
<td>10</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>S13</td>
<td>2-legs, 15-kg barbell on shoulder</td>
<td>8</td>
<td>4</td>
<td>32</td>
</tr>
</tbody>
</table>

Including CODs. It is possible that the amount of feet-specific training (i.e., 30-45 min a week) was too low to observe beneficial changes in those well-trained young elite players, or that the exercises chosen were not optimal. The impact of greater exercise loads and/or other exercises needs to be investigated in the future.

Practical applications

- Performing 30 to 45-min weekly of feet work (including proprioception, hopping and stretching) is unlikely to impact jumping, acceleration and overall change of direction ability in elite adolescent handball players.
- Practitioners may need to either increase the load (e.g., same program twice a week) or more likely include exercises involving horizontally-oriented force production, which may transfer better to running performance (13, 14).

Limitations

- Individual training load was not controlled but irrespective of the experimental group 1) all players participated in the same training sessions throughout the study and 2) being the best in their age categories, played most of the games every week ends.

Dataset

Dataset available on SportPerfSci.com

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References


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