Is a Poor Score on the Modified Active Knee Extension Test a Risk Factor for Hamstring Injury in Gaelic Games?

Siobhán O’Connor, Noel McCaffrey, Enda Whyte, Kieran Moran

School of Health & Human Performance, Dublin City University, Ireland
What are Gaelic Games?
Leading cause of injury in Gaelic games
- 4.0-17.6% of all injuries in adolescent & collegiate Gaelic players

- Poor hamstring flexibility proposed as a risk factor for injury
  - Conflicting findings in the literature

- Modified active knee extension test
  - Quick
  - Simple to execute
  - Accurate
  - Reliable
  - No expensive equipment

- No research in Gaelic games
1. Present normative data for the modified AKI test in this population
2. Establish whether the modified AKI test can predict hamstring injury in Gaelic games
3. Identify population specific cut-off points for this population for clinicians to use to predict those at risk of a hamstring injury
Injuries assessed
All hamstring injuries examined by an ARTC prospectively over 1 season

Modified AKE test
Bubble inclinometer
Both legs
Nearest degree

Logistic Regression

Male adolescent & collegiate Gaelic footballers & hurlers
570 players
17.7±2.3 years
1.78±0.08m
71.5±10.9kg

ROC curves
### Results

<table>
<thead>
<tr>
<th></th>
<th>Total Mean±SD</th>
<th>Adolescents Mean±SD</th>
<th>Collegiate Mean±SD</th>
<th>Hamstring injury</th>
<th>No hamstring injury</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AKE (°)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant</td>
<td>64.2±12.3</td>
<td>63.1±12.9</td>
<td>65.0±11.8</td>
<td>65.8±12.1</td>
<td>64.1±12.3</td>
</tr>
<tr>
<td>Non-dominant</td>
<td>64.1±12.4</td>
<td>61.5±13.4</td>
<td>66.1±11.0</td>
<td><strong>69.2±11.4</strong></td>
<td>63.8±12.4</td>
</tr>
<tr>
<td>Asymmetry</td>
<td>5.5±4.8</td>
<td>5.7±5.1</td>
<td>5.4±4.4.5</td>
<td>5.8±4.5</td>
<td>5.5±4.8</td>
</tr>
<tr>
<td><strong>&lt;65°(%)</strong></td>
<td>Non-dominant</td>
<td>51.1</td>
<td>58.4</td>
<td>45.2</td>
<td><strong>38.7%</strong></td>
</tr>
</tbody>
</table>

- **Regression**
  - Significant model generated ($\chi^2=9.20, p=0.01$)
    - Only AKE on non-dominant leg left in multivariate model
    - OR=1.03 [95% CI: 0.99-1.07]
    - Sensitivity 0%
    - Specificity 100%
Take Home Message

• Hamstring flexibility measured using the modified AKE test can’t predict hamstring injury in Gaelic games
• Asymmetry also doesn’t predict hamstring injury in these sports
• The developed cut-off point, identified $\frac{1}{2}$ of players were at risk of being injured but only just under $\frac{3}{5}$ of these players actually sustained a hamstring injury
• Modified AKE not a useful screening tool
  • Hamstring eccentric strength
  • Hamstring to quadriceps strength ratio
siobhan.oconnor@dcu.ie

@SiobhanOConnor3

https://www.researchgate.net/profile/Siobhan_Connor