Return to Play and Recurrence Rate following Hamstring Injury in Elite Football: use of the British Athletic Muscle Injury Classification

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Background Hamstring Muscle Injury

- Significant concern in football owing to prolonged competition absence (Ekstrand et al., 2016)
- Challenging to predict injury and determine clinical or imaging consensus for safe return-to-play
- British Athletics Muscle Injury (BAMI) classification may assist injury classification, management and prediction (Pollock et al., 2014)
- No research evaluating use of the BAMI classification in elite male professional football

Purpose: To evaluate use of the BAMI classification and its association with time to return to play (TRTP) and recurrence following hamstring injury in elite male football players
Methods

Design

- Observational retrospective cohort study
- Across 6 competitive seasons
- August 2017
- According to a pre-defined protocol

Participants

- Male first-team players at Aston Villa Football Club
- Diagnosed with an acute hamstring injury following MRI within 7 days of injury
- Data were extracted from electronic records included TRTP and recurrence

Data analyses

MRI images independently evaluated and classified by 2 experienced musculoskeletal radiologists using the BAMI classification by grade (0-4) and location (a-c)

Kruskal Wallis, Fisher’s exact, and binary logistic regression enabled exploration of the relationships between variables
## Results

<table>
<thead>
<tr>
<th>BAM1 Classification</th>
<th>No of injuries</th>
<th>Mean TRTP (SD; range)</th>
<th>Recurrence rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>12.5 (8.1; 3-24)</td>
<td>1 (10)</td>
</tr>
<tr>
<td>1a</td>
<td>6</td>
<td>8.3 (4.6; 2-14)</td>
<td></td>
</tr>
<tr>
<td>1b</td>
<td>10</td>
<td>20.2 (14.1; 7-54)</td>
<td>2 (10)</td>
</tr>
<tr>
<td>2a</td>
<td>2</td>
<td>14 (15.5; 3-25)</td>
<td></td>
</tr>
<tr>
<td>2b</td>
<td>10</td>
<td>18.9 (8.8; 6-36)</td>
<td>2 (20)</td>
</tr>
<tr>
<td>2c</td>
<td>6</td>
<td>40.2 (25.1; 8-69)</td>
<td>3 (50)</td>
</tr>
<tr>
<td>3a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3b</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3c</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>44</td>
<td>19 (15.6; 2-69)</td>
<td>8 (18)</td>
</tr>
</tbody>
</table>
Results

- 44 hamstring injuries from 28 players
- Mean (SD) age 25 (4.69) years
- Mean (SD) TRTP following injury 18.98 (15.58) days
- 8 cases of recurrence
- 50% of intratendinous (location c) cases recurred

- Significant difference between BAMI classification and TRTP (p< 0.05)
- Significant difference in TRTP between location c and no tendon involvement (p<0.01)
- No significant differences in TRTP:
  - Grade 1 and 2 injuries (p>0.05)
  - Locations a (myofascial) and b (musculotendinous) (p>0.05)
- Hamstring injury recurrence was not concomitant with grade (p>0.05) or location (p>0.05)
Discussion and conclusions

The BAMI classification is a promising tool to categorise and predict TRTP after hamstring injuries in elite football.

- Higher BAMI grade is associated with increasing TRTP
- Intra-tendinous injuries (c) are associated with longer TRTP
- 50% recurrence 2c – in contrast to recent data (van der Made et al, 2018)
- Strength – access to elite players
- Limitation - sample size

- Tendon related information from the BAMI classification appears clinically useful
- Recognition of an intramuscular tendon injury may be important