
Justin Makovicka MD, Anikar Chhabra MD, Karan Patel MD, Sailesh Tummala BS, Jeff Hassebrock MD, Andrew Chung MD, Zach Christopher MD, David Hartigan MD
Disclosures

• Anikar Chhabra
  • Consultant: Arthrex, Trice Medical, Zimmer Biomet
  • Education Support: Stryker, Cayenne Medical

• David Hartigan
  • Consultant: Arthrex
  • Education Support: Stryker, Smith & Nephew

• Other Authors
  • No Relevant Disclosures
Introduction

- Highest proportion of NCAA student-athletes
  - >60,000

- Leading cause of sports-related injuries per exposure
  - ~Double rate found in basketball

- Complex, high-energy sport
  - High likelihood of injury
  - ↑ risk for all types of hip injuries

- Hip Injuries in football athletes
  - ~9% High School
  - ~17% NCAA
  - ~3.1% NFL

- Previous research limited to professional athletes

- Important to evaluate in NCAA athletes
NCAA ISS

• Data-collection surveillance program
  • Collect injury & exposure data
  • Foundation for evidence-based decision making

• Convenience sampling of NCAA teams

• Reporting by athletic trainer
  • Details of injury
    • Activity, mechanism, comp vs practice
  • Number of athlete exposures
Purpose

- To analyze the NCAA Injury Surveillance System men’s football hip injury database from the 2004-2005 through 2013-2014 academic years to determine the specific incidence, risk factors, and epidemiology of hip injuries in NCAA football players.
Methods

- NCAA ISS database queried for hip injuries in football players over 10-yr period
- Programs participating varied by year
  - 2004-2009: 60 programs
  - 2009-2014: 25 programs
- Each NCAA division represented in sampling
- Definitions
  - *Reportable Injury:*
    - Result of practice or competition
    - Required attention from ATC or physician
  - *Athlete-Exposure:*
    - 1 athlete participating in 1 practice or competition
Analysis

- **Injury Rate:**
  \[
  IR = \frac{\text{Number Injuries}}{\text{Number Athlete-Exposures}}
  \]

  - Overall & individual rates (event & season type) calculated

- **Injury Rate Ratios:**
  \[
  IRR = \frac{\sum \text{Number of competition injuries}}{\sum \text{Competition AEs}} \div \frac{\sum \text{Number of practice injuries}}{\sum \text{Practice AEs}}
  \]

  - Compare injury rates between event & season types
Results

• 1,618 hip injuries over 10-yr period

• 3,121,380 athlete-exposures

• Overall injury rate:
  • 5.18 hip injuries per 10,000 AEs
Results

- Event Type:

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Rate Ratios (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition vs Practice</td>
<td>3.56 (3.19-3.98)</td>
</tr>
<tr>
<td>Pre-season vs In-Season</td>
<td>2.37 (2.15-2.62)</td>
</tr>
<tr>
<td>Pre-season vs Post-Season</td>
<td>3.56 (2.49-5.08)</td>
</tr>
<tr>
<td>In-Season vs Post-Season</td>
<td>1.5 (1.05-2.15)</td>
</tr>
</tbody>
</table>

- Time in Season:

- Time Loss:
  - Avg of 5.93 days
# Results

- **Injury Type:**

<table>
<thead>
<tr>
<th>Injury</th>
<th>Total Injuries (%)</th>
<th>0-6 Days Lost (%)</th>
<th>7-13 Days Lost (%)</th>
<th>14-29 Days Lost (%)</th>
<th>30+ Days Lost (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adductor Strain</td>
<td>625 (38.63%)</td>
<td>387 (61.92%)</td>
<td>150 (24.00%)</td>
<td>50 (8.00%)</td>
<td>12 (1.92%)</td>
</tr>
<tr>
<td>Hip Flexor Strain</td>
<td>462 (28.55%)</td>
<td>309 (66.88%)</td>
<td>89 (19.26%)</td>
<td>39 (8.44%)</td>
<td>6 (1.30%)</td>
</tr>
<tr>
<td>Hip Contusion</td>
<td>293 (18.11%)</td>
<td>229 (78.16%)</td>
<td>41 (13.99%)</td>
<td>6 (2.05%)</td>
<td>2 (0.68%)</td>
</tr>
<tr>
<td>Internal Rotator Strain</td>
<td>79 (4.88%)</td>
<td>49 (62.03%)</td>
<td>12 (15.19%)</td>
<td>3 (3.80%)</td>
<td>3 (3.80%)</td>
</tr>
<tr>
<td>Other Hip Injury</td>
<td>71 (4.39%)</td>
<td>51 (71.83%)</td>
<td>5 (7.04%)</td>
<td>5 (7.04%)</td>
<td>2 (2.82%)</td>
</tr>
<tr>
<td>Gluteus/Abductor Strain</td>
<td>32 (1.98%)</td>
<td>27 (84.38%)</td>
<td>1 (3.13%)</td>
<td>2 (6.25%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>External Rotator Strain</td>
<td>20 (1.24%)</td>
<td>13 (65.00%)</td>
<td>3 (15.00%)</td>
<td>1 (5.00%)</td>
<td>1 (5.00%)</td>
</tr>
<tr>
<td>Articular Lesions</td>
<td>12 (0.74%)</td>
<td>4 (33.33%)</td>
<td>0 (0.00%)</td>
<td>1 (8.33%)</td>
<td>2 (16.67%)</td>
</tr>
<tr>
<td>Hip Subluxations/Dislocations</td>
<td>13 (0.80%)</td>
<td>4 (30.77%)</td>
<td>1 (7.69%)</td>
<td>1 (7.69%)</td>
<td>1 (7.69%)</td>
</tr>
<tr>
<td>Greater Trochanteric Bursitis/ Snapping Hip Syndrome</td>
<td>10 (0.62%)</td>
<td>6 (60.00%)</td>
<td>2 (20.00%)</td>
<td>2 (20.00%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>Labral Tears</td>
<td>1 (0.06%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
<td>0 (0.00%)</td>
</tr>
</tbody>
</table>
Discussion

• Muscle Strains
  • >75% of injuries
  • Adductor & hip flexor most common
  • Consistent with NFL findings

• Event Type:
  • More frequent in competition
  • ↑ competition injury rates across multiple levels of play
  • Less predictable playing environment, greater speed & intensity

• Time in Season:
  • More frequent in pre-season
  • 16-yr review: 2x ↑ injury rate during spring practice
  • Nature of practices:
    • In-Season: mental preparation
    • Pre-Season: development & fundamentals
  • Conditioning level
Conclusion

• During the 10-yr period from 2004-2005 through 2013-2014 academic years, NCAA football players suffered hip injuries at a rate of 5.18 injuries per 10,000 AEs.

• These athletes most commonly suffered muscle strains and the injuries more frequently occurred in competition and during the pre-season.

• Invaluable to better understanding these injuries & allowing for prevention efforts to decrease their frequency.
References


