THROWING WORKLOAD AND INJURY RISK IN ELITE CRICKETERS

Background

- Baseball data: workloads associated with upper limb injuries
- Anecdotal evidence: increased injuries from ‘throw downs’
- Fast bowling workloads: shown to increase risk of injury

Objective: To investigate the association between throwing workload and injury to the upper limb in elite cricketers
Common injuries:
- Rotator cuff tears / tendinopathy
- Anterior laxity of glenohumeral joint
- Elbow:
  - Ulnar collateral ligament sprains or laxity

Most baseball workload data not published

Workload as a risk factor:
- more pitches per game (>75)
- innings per game
- pitches per year (>600)
- games per year
- months in a year (>8)
Relating Baseball Data to Cricketers

- Maximal effort
- Various distances
- Wind-up
- Throwing off balance + at awkward angles
- ‘Poor’ throwing style → increased risk of injury

The different styles of throwing. From left to right- overhead, ¾ arm, sidearm and submarine styles.
Why Look at Throwing Workload in Cricketers?

- Anecdotal evidence:
  - More ‘throw-downs’
  - Greater emphasis on fielding drills

- Injury data on missed matches only
  - May playing with throwing injury if it does not affect batting, bowling or wicket keeping

- 23% players sustained shoulder injury in English self-reported study
  - 69% did not miss any matches
  - 63% reported a negative impact on fielding
  - 57% moved fielding position
Study design

Injury surveillance completed by state squad physiotherapist

- Injuries to the shoulder and elbow that were associated with throwing
- Affected ability to participate in a match or training

Counting throws

Training days

- Throw downs
- Drill throws

- Direct observation at training
- Player logbooks

Match days

- Match warm up
- Match throws

- Physio

Video footage of 1st and 2nd XI matches
Results

• 2102 throwing sessions
• 42000 throws

- Throw downs
  Mean = 67

- Drill throws
  Mean = 42

- Match warm up
  Mean = 27

- Match throws
  Mean = 10

• 7 eligible injuries:
  • 3 superior labrum from anterior to posterior (SLAP) lesions
  • 3 internal glenohumeral impingements
  • 1 tear of anterior band of the ulnar collateral ligament of elbow
Theresa per week & injury

Mean

Uninjured
73 ± 26

Injured
112 ± 36

p = 0.003*

Median: >75 throws

RR = 1.73*
(1.03 – 2.92)
Throws per day & injury

Mean

Uninjured
38 ± 15

Injured
50 ± 13

p = 0.061

Median: >40 throws

RR = 1.41
(0.88 – 2.26)
Rest days & injury

Mean (rest days per throwing day)

- Uninjured: 2.88
- Injured: 2.61

Median: <3 days

Relative Risk (RR) = 1.16
(0.77 – 1.75)

p = 0.555
### Injured players – 1 week prior

<table>
<thead>
<tr>
<th></th>
<th>Week prior</th>
<th>Season</th>
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<tbody>
<tr>
<td><strong>Mean throwing days per week</strong></td>
<td>4.1 ± 0.7</td>
<td>2.4 ± 0.7</td>
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<td></td>
<td></td>
<td>p = 0.0001*</td>
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<tr>
<td><strong>Mean throws per week</strong></td>
<td>146 ± 54</td>
<td>107 ± 33</td>
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<td></td>
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<td>p = 0.0441*</td>
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Discussion

Workload thresholds for increased risk of injury

**Our study:**
- >75 throws / week
- >40 throws / day

**Baseball:**
- >75 – 80 pitches / match

**Fast bowling:**
- <120 deliveries / week
- >190 deliveries / week
  * Rest days (2-5)
Limitations

• Not able to record throw counts for grade club matches / training
  • But able to record full set of ‘throwing days’
• Maximal vs sub-maximal efforts
• Throwing style
• Throwing workload study with junior players
Implications

- Alternatives to throw downs
  - Bowling machines
  - Dog-throwers
- Monitor loads during training camps, tours