Risk Factors for Little League Shoulder

Limited range of motion may predict future injury

Little League elbow, or medial apophysitis, is a common overuse injury that affects young pitchers. Less well known, but increasing in frequency, is another overuse injury—proximal humeral epiphysiolysis, or Little League shoulder (LLS). During the 2014 annual meeting of the American Orthopaedic Society for Sports Medicine (AOSSM), Benton E. Heyworth, MD, from the division of sports medicine at Children’s Hospital Boston, presented research on the demographics, symptoms, diagnosis, and treatment of LLS, with an emphasis on identifying underlying risk factors for development and recurrence of LLS.

LLS is an overuse injury to the growth area of the humerus at the shoulder joint. It may result from too much throwing, repeated overhead throwing using improper mechanics, or lack of muscle strength and endurance.

Dr. Heyworth and colleagues conducted a retrospective review of all cases of LLS seen at their hospital between 1999 and 2013. “We identified 95 patients (97 percent male), ranging from 8 to 17 years of age, who were diagnosed with LLS,” said Dr. Heyworth. “Half of the patients were only 12 or 13 years old, a good indicator of the stress being put on young arms.”

Two sports accounted for most of the cases of LLS. “Not surprisingly, 97 percent of the affected athletes were baseball players—and 86 percent of those players were pitchers,” noted Dr. Heyworth. Tennis players were the second most affected group of athletes.

All the patients reported shoulder pain with overhead athletics. On physical exam, 30 percent of affected players were reported to have glenohumeral internal rotation deficit (GIRD), a condition resulting in the loss of internal rotation and a reduced range of motion. These patients were three times more likely to experience an injury recurrence 6 to 12 months after returning to play.

“The data showed that 13 percent of patients treated also reported elbow pain, 10 percent reported shoulder pain or weakness, and 8 percent reported other mechanical symptoms,” Dr. Heyworth noted. “These related symptoms should be recognized as possible identifiers for injured athletes in the future.”

Treatment

Treatment options for players included rest in 98 percent of cases; 79 percent of players—including all of the players with GIRD—received physical therapy. A quarter of the patients received a treatment recommendation to shift to a different field position after returning to play. The average time for returning to play was 4.2 months from injury diagnosis.

Among all patients, 7.4 percent reported recurrent symptoms at a mean of 8 months following resolution of the initial symptoms. The odds ratio of recurrence between the group with diagnosed GIRD and those without GIRD was approximately 3:1.

Little League Baseball has developed guidelines for young pitchers to help reduce the risk of injury (Table 1).

Table 1: Recommended Pitch Counts by Age and Associated Rest Periods

<table>
<thead>
<tr>
<th>Age of Athlete</th>
<th>Pitch Limits per Day</th>
<th>Number of Pitches Thrown</th>
<th>Days of Rest</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-18</td>
<td>105</td>
<td>1-20</td>
<td>0</td>
</tr>
<tr>
<td>13-16</td>
<td>95</td>
<td>21-40</td>
<td>1</td>
</tr>
<tr>
<td>11-12</td>
<td>85</td>
<td>41-60</td>
<td>2</td>
</tr>
<tr>
<td>10-under</td>
<td>75</td>
<td>61+</td>
<td>3</td>
</tr>
</tbody>
</table>

(Courtesy of Little League Baseball)

Dr. Heyworth’s coauthors for “Trends in the Presentation, Management and Outcomes of Little League Shoulder” included Daniel Martin; Dennis E. Kramer, MD; Mininder S. Kocher, MD, MPH; and Donald S. Bae, MD.

Disclosure information:

Dr. Heyworth—AOSSM, Pediatric Orthopaedic Society of North America (POSNA); Mr. Martin, Dr. Kramer—no conflicts. Dr. Kocher—Biomet, Best Doctors, Gerson Lehman Group, OrthoPediatrics, Smith & Nephew, Fixes 4 Kids, Pivot Medical, Saunders/Mosby-Elsevier, AAOS, ACL Study Group; AOSSM, Harvard Medical School, Harvard School of Public Health, Herodocus Society, POSNA, PRISM, Steadman Philippon Research Institute.

Bottom Line

- Little League shoulder (LLS) is being diagnosed with increasing frequency, primarily among male baseball pitchers and tennis players.
- Treatment generally focuses on rest and physical therapy, but symptoms may recur generally 6 to 12 months after return to sports.
- In this study, almost one-third of LLS patients had GIRD, and this group had three times higher probability of recurrence compared to those without GIRD.