INTRODUCTION

• Ulnar collateral ligaments (UCL) of the elbow injuries
  • Common injury to baseball pitchers
  • Increasing incidence at all levels and ages

• Biomechanical aspects
  • Large valgus stress on elbow when pitching
  • UCL is primary restraint of valgus stress at elbow
  • Studies have shown pitchers approach or exceed the maximum tensile strength of UCL
  • There are additionally secondary restraints:
    • Pronator Teres (PT)
    • Flexor Carpi Ulnaris (FCU)
    • Flexor Digitorum Superficialis (FDS)
  • Secondary restraints possibly offer protection to UCL

• Goal:
  • Do secondary muscle restraints to valgus stress weaken in professional baseball pitchers during the season?

MATERIALS AND METHODS

• 19 professional baseball pitchers
  • Assessed strength of FDS, PT, and FCU
  • Customized testing devices
  • Before and end of season testing
  • Dominant and non-dominant arms
  • Correlate with UCL injuries
  • The maximum isometric force produced over three trials was defined as their strength in each test
  • A comparison between spring and fall was done using a paired two sample T-test for means.

RESULTS

• Decreased strength in both arms at end of season for all three muscles
  • Loss of strength was greater in throwing arm
  • PT and FCU decrease was statistically significant in only the throwing arm
  • p value = .001 for PT
  • p value = .003 for FCU
  • 2 of the 19 subjects suffered a UCL tear during season. The two were the weakest and third weakest of the 19 subjects based on a composite percentile strength ranking from the spring assessment.

SUMMARY AND DISCUSSION

In this study, we showed a diminution of strength of the muscles that act as secondary stabilizers of the ulnar collateral ligament over the course of the professional baseball season. The flexor pronator muscles (specifically the FCU, PT, and FDS) may help protect baseball pitchers from ulnar collateral ligament injuries and weakness of these muscles might make individuals prone to ulnar collateral ligament injuries and subsequent valgus overload syndrome. It is possible that this data would be helpful to predict individuals who are predisposed toward ulnar collateral ligament injuries over the course of the baseball season.

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REFERENCES