E-Poster

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Mechanisms of Concussion and Ulnar Collateral Ligament Injury in Sports: Criteria and Rationale for Return to Play

Topic: Specific Target Groups (Children, Women, Elderly, Athletes, Musicians, Refugees, Ethnic Groups, Workers, and Others)

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BACKGROUND

Return-to-play (RTP) readiness is a critical consideration for common baseball injuries, particularly ulnar collateral ligament (UCL) injuries and concussions. UCL injuries, often resulting from repetitive throwing stress, can significantly impact an athlete's career, requiring interventions ranging from nonoperative rehabilitation to surgical reconstruction. Similarly, concussions, caused by external impacts to the head, present substantial risks due to their cognitive and neurological consequences. While RTP criteria for these injuries exist, they remain inconsistent across studies and clinical practice. This systematic review aims to compare RTP criteria for UCL injuries and concussions, assessing their rehabilitation processes, objective testing methods, and challenges in ensuring safe and effective return to sport.

METHODS

This systematic review follows the PROSPERO protocol (CRD42024607322) and adheres to the PRISMA guidelines. Two independent reviewers conducted a comprehensive search across PubMed, Scopus, and Embase to identify relevant studies. Search results were imported into Covidence for systematic screening and data management. Any disagreements or uncertainties in study selection were resolved by a third reviewer to ensure consistency and accuracy. After full-text screening and eligibility assessment, 41 articles were included for data extraction.

RESULTS

Findings indicate that RTP rates for UCL injuries vary based on the severity of the injury and treatment approach. UCL reconstruction in professional pitchers demonstrated an RTP rate between 79% and 91%, with 71% to 90% returning to the same level of competition. However, the recovery timeline ranged from 12 to 18 months, and nearly 46% experienced secondary injuries post-surgery. Nonoperative management in high school players showed an 83.6% success rate, with stress ultrasound proving useful in predicting outcomes. In contrast, concussion RTP protocols varied significantly across sports organizations, with Major League Baseball (MLB) mandating a seven-day minimum recovery period, while other leagues relied on symptom-based assessment. Neurocognitive and reactive testing emerged as essential tools for concussion RTP decisions, emphasizing the importance of cognitive function over symptom resolution alone. Compared to UCL injuries, concussions had more unpredictable recovery timelines, often requiring weeks to months, with long-term risks of neurocognitive impairment.

CONCLUSION

This review highlights inconsistencies in RTP criteria for UCL injuries and concussions, emphasizing the need for standardized protocols. UCL RTP relies on functional milestones, while concussion RTP prioritizes cognitive recovery. Assessments integrating biomechanical and neurocognitive testing could improve safety. Research should refine RTP models to balance physical and cognitive readiness.

Statement of Disclosures

None

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