

ACL GRAFT FAILURE IN PROFESSIONAL ATHLETES COMPARED TO THE PEDIATRIC POPULATION

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BACKGROUND

Re-tear rates in pediatric and adolescent patients undergoing ACL reconstruction are higher than the general adult population. This has been postulated to be due to many reasons; one of which is participation in high risk activities. Athletes in professional sports are at increased risk of re-injury as well with high activity levels and often face additional pressure to return to sports quickly. The purpose of the study was to analyze ACL re-tear rates across male professional sports leagues in athletes following ACL reconstruction and return to play at the professional level to determine if there are similarities with the pediatric and adolescent population.

METHODS

This descriptive epidemiological study involved a comprehensive online search to identify male athletes in the National Basketball Association (NBA), National Hockey League (NHL), and Major League Baseball (MLB) who had a reported ACL tear between 2007 and 2017. The search included these professional sports league databases, public injury databases, and sports news reports. Each player with an identified ACL tear was searched for history of additional ACL injury. Re-tear rate was calculated for each league. For each ACL tear, the laterality, player position, return to play (defined as playing at least one game in a major or minor league in that sport), and approximate time to re-tear (months) were documented. Mechanism of tear (contact vs. non-contact) was recorded when available for the initial tears and retears via news reports or available video. Fisher's exact test was performed to evaluate differences amongst re-tear rates and ANOVA was used to evaluate differences in time to re-tear amongst the three leagues.

RESULTS

The total number of ACL tears identified was 109 and the total number of re-tears was 13, for a total re-tear rate of 11.9%. ACL re-tear rates by league did not statistically differ, and were as follows: MLB, 11.5%; NBA, 9.3%; and NHL, 15.0%. Average time to re-tear was also not significantly different and was 24.7 months for MLB, 31.8 months for NBA, and 26.0 months for NHL. Return to play rate after index surgery was 94%, whereas return to play after a revision procedure was 84.6%. Our prior published meta-analysis of pediatric and adolescent ACL reconstruction failure rates was 8.3%.

CONCLUSIONS / SIGNIFICANCE

The ACL re-tear rates in multiple male professional sports leagues are higher than those reported in large registry studies and similar to the ACL re-injury rates previously reported in the NFL (12.3%). These revision rates are also more similar to those reported for pediatric patients. Exposure to high-risk sporting activity is likely a primary cause of ACL re-tear. The cited rates of ACL re-tear may thus be interpreted as a 'best-case scenario' in athletes returning to the highest level of activity, and may help to explain the similar high re-tear rates in the pediatric and adolescent population.

TABLES AND FIGURES

Figure 1. ACL Re-Injury Rates by League and Age

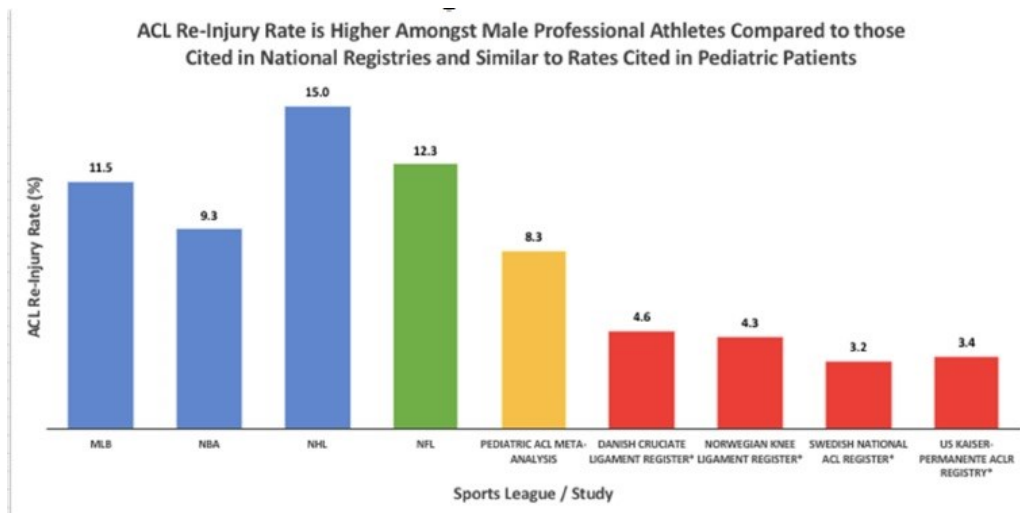


Figure 1. ACL re-injury rates by male professional sports leagues or study group. MLB, NBA, NHL re-tear rates (labeled in blue) were derived from the present study. NFL re-tear rate (labeled in green) was derived from Dodson CC, et al. Orthop J Sports Med 2016. Pediatric data (labeled in orange) was derived from Wong SE, et al. Journal of Pediatric Orthopedics 2017. Registry data (labeled in red) was derived from Prentice et al. British J Sports Med 2018. Using Fisher's Exact test, no significant difference was found between the rates of re-tear in the present study (MLB, NBA, NHL) vs. the cited rate in the NFL and no significant difference was found between the present study vs. the cited rate in pediatric patients. *Chi-Square test with Yate's correction yielded significant difference ($p < 0.05$) between the present study and each of the national registry rates cited.

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