

# Effects of Platelet-rich Plasma Injections on the Healing of Different Tissues in Athletes

Kelly Griffith  
Fort Hays State University

## Abstract

Sprains, strains, and tendinopathies are some of the most common injuries in athletics and each present their own challenges for sports medicine practitioners. A new form of nonoperative treatment called Platelet-rich plasma (PRP) injections have gained attention and consideration for treating soft tissue injuries. PRP is a preparation of autologous human plasma with an increased platelet concentration. When injected, the PRP releases larger amounts than normally found in the body of growth factors and cytokines to the injury site. This is theorized to start the natural healing process. The purpose of this study was to analyze the effects of platelet-rich plasma injections in athletes suffering from ligament, tendon, or musculoskeletal injuries through a systematic review of literature.

## Introduction

Tendinopathies often occur due to overuse of the limb. The etiology of this injury is unknown and can have multiple predisposing factors. The prevalence of tendonitis in sports in the United States is estimated to be about 30-50% (Ackerman & Renstrom, 2012). Muscle strains usually occur acutely in the eccentric phase with the hamstring most often affected (Maffuli et al., 2014). Muscle injuries account for 10 to 55% of all acute sports injuries (Maffuli et al., 2014). Ligament sprains account for around 15-17% of sport related injuries with ankle sprains being the most common (Herzog, Kerr, Marshall, & Wikstrom, 2019). Each tissue type presents with its own signs and symptoms, treatment options, and time to return to play. The use of PRP injections has just recently gained traction and are being heavily researched to prove its efficacy in healing all types of tissues in the sports community.

## Methodology

A search of Pubmed, Cochran Central, Ebscohost, and Medline was conducted with the keywords “platelet-rich plasma injections” followed by “in athletes”. The inclusion criteria consisted of the article analyzing the use of PRP injections for treatment of a sprain, strain, or tendinosis in athletes. Athletes for this review were defined as sport playing person anywhere from 16-35 years old. The exclusion criteria were articles which used PRP injections for non-athletes, the experiment was conducted on animals, or the study compared the injections to another form of treatment. Any study found not meeting the clinically relevant question were not considered. The methodology of each article found was critically appraised using the PEDro appraisal scale. Any article which scored above a five was included and any articles which scored under a five were excluded from the review.

## Conclusion

The study analyzed new research on the overall effectiveness of platelet-rich plasma injections in the athletic population. The available evidence showed an overall positive outcome, but some precautions of accepting the research should be considered. More research should be conducted to solidify these results. Once the research has proven it to be a new form of effective treatment, then it can be utilized to aid in the healing process,, decrease pain, and decrease time to return to play.

## Results

Sources	Number of Participants	Outcome Measures	# of Injections	Improved Healing and Return to Play (RTP)?
<b>Tendons</b>				
Charoussat et al. (2014)	28	MRI, VAS, VISA-P Lysholm pain scores.	3	21 returned asymptomatic at 3 months. 16 out of the 21 athletes MRI's showed improved structural integrity
Kon et al. (2009)	20	Tegner score, EQ-VAS, SF-36, functional testing	3	all participants had improvements in their scores at the six month follow up.
Zayni et al. (2015)	40	VISA-P, VAS, Tegner	2 vs 1	Of the 30 patients, 26 of them returned to their pre-symptom sporting level after a mean delay of 6.7 weeks. Found 2 injections to be better than 1
<b>Muscles</b>				
A Hamid et al. (2014)	28	Time to RTP, Brief Pain Inventory Short Form	2	PRP injections group achieved full recovery around 26.7± 7 days. The control group achieved full recovery around 42.5 ± 20.6 days. Lower pain scores were also observed in the PRP injection group.
Rettig et al. (2013)	10	Time to RTP	1	no significant differences between the two groups regarding RTP. The control group returned in a median time of 17-days the treatment group returned in a median time of 20-days.
Rossi et al. (2016)	75	Time to RTP, Pain severity, Reoccurrence rates	1	the treatment group returned to play in 21.1 ± 3.1 days while the control group returned in 25 ± 2.8 days. The pain severity scores were also significantly lower in the PRP group
Rostyslav et al., (2013)	30	VAS, muscle function, regeneration of tissue	1	Pain was significantly lower in PRP group and regeneration was happening quicker than the control group.
<b>Ligaments</b>				
Podesta et al. (2013)	34	Time to RTP, DASH, and KJOC	1	30 of the 34 athletes returned to the same level of play w/o complaints in 12 weeks. The average KJOC score improved from a 46 to a 93. The DASH improved from a 69 to a 3.
Deal et al. (2017)	25	Reconstruction via MRA, Time to RTP	2	The posttreatment MRA showed full reconstitution in 20 of the 22 patients who successfully returned to play.
Chauhan et al., (2019)	544	Time to RTP, Kaplan-Meier Survival analysis	1	players who received PRP had a significantly longer delay in return to throwing when compared to the other group. However, the survival analysis did not provide significant differences between groups.
Laver et al., (2015).	16	Time to RTP, Tegner activity Level	2	The mean RTP for the control group was d 59.6 ± 12.0 days treatment group had 40.8 ± 8.9 days. The pain of the patients after RTP, only 12.5% of patients from the treatment group experienced pain compared to 62.5% in the control group.

