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Complications of Platelet-Rich Plasma Injections for Foot and Ankle Disorders: A Systematic Review

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Disclosures

- Senior author Matthew Salzler is on the editorial board for Arthroscopy.
- There are no other conflicts among authors.

Background and Objectives

Platelet-rich plasma (PRP) is a biologic that contains growth factors and extracellular matrix proteins that promote healing [1, 2].

Treatment of orthopedic foot and ankle disorders have seen expanding use of PRP injections, however there is a paucity of data assessing complications associated with PRP for these disorders [3-5].

The primary aim of this review is to investigate complications related to PRP injections for orthopedic foot and ankle pathologies including gastrocnemius tendinopathy and rupture, ankle osteoarthritis, plantar fasciitis, and osteochondral lesions of the talus.

This study also aims to provide insight into potential adverse reactions following PRP injections to better inform clinical decision making.

Materials and Methods

Database search:

- A systematic review of PubMed, Embase, Web of Science, and Cochrane databases was conducted in accordance with the Preferred Reporting Items for Systematic Reviews (PRISMA).

Study Selection:

- Studies were included if they were randomized controlled trials (RCT) comparing complications following isolated PRP injections to comparable injectable or needle-based treatment of foot and ankle pathologies in a non-operatve setting
- Non-RCTs studies, studies that did not report complications, and non-English studies were excluded

Materials and Methods

Data Collection and Analysis

- From included articles, condition studied, follow-up time, sample size, patient demographics, and complication details were extracted.
- Complication rates for the PRP group and the controls were pooled and compared using Chi-Squared and Fischer exact tests, with a p-value less than 0.05 indicating significance
- Number needed to harm (NNH) was calculated for PRP injections using all other comparative injectable as the control

Results:

Study identification	Comparison treatments
• 4802 Articles screened • **16 included studies** • Plantar Fasciitis- 8 studies • Gastrocnemius tendinopathy- 5 studies • Gastrocnemius tendon tears – 1 study • Ankle osteoarthritis – 1study • Osteochondral lesion of the talus -1study	• Corticosteroid injection - 4 studies • Saline injections - 4 studies • Dry needling – 2 studies • Saline and Corticosteroid injections - 1 study • Prolotherapy and Corticosteroid injections – 1 study • Hyaluronic acid injection – 1study • Dextrose solution injection – 1 study • High volume injection (saline and anesthetic) – 1 study • Stromal vascular fraction – 1study

Results:

Subject Characteristics

PRP injections

- 664 subjects received PRP injections

Control group

- 738 subjects received an alternative treatment

Sex

- 646 Females
- 737 Males
- 19 Unspecified sex

Mean age range

- 32.6-56.4 years

Results:

Complications

- 12 studies reported no complication among either group.
- The remaining four studies reported a cumulative 214 complications in the PRP group and 185 complications in the control group

Complication	PRP Group (%), n = 664	Comparison Group (%), n = 738	p-value	NNH
Muscle soreness	11 (1.7)	8 (1.1)	0.355	175
Post-injection pain	98 (14.8)	75 (10.2)	**0.009**	22
Swelling	56 (8.4)	52 (7.0)	0.331	72
Bruising	48 (7.2)	49 (6.6)	0.664	170
Severe pain requiring surgery	1 (0.2)	0	0.474	664
Allergic reaction	0	1 (.1)	1	738
Total complications	214	185		
Overall Rate	32.20%	25.10%	**0.003**	
ARI	7.20%			
NNH	14			

Abbreviations: PRP = platelet rich plasma, NNH = number needed to harm, ARI = absolute risk increase

Conclusion:

PRP injections for foot and ankle pathologies are generally safe, with an estimated 14 patients needing to receive PRP injections to experience a complication over an alternative treatment.

Among 664 subjects only one patient experienced a complication necessitating surgical intervention. No other serious complication or infections occurred.

Significance of the Study Findings:

While the efficacy of platelet-rich plasma injections for treating orthopeadic foot and ankle disorders with is variable in literature, this study suggests there is minimal risk to patients who elect to trial PRP therapy.

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Thank You

For questions email me at Stephen.Fucaloro@tufts.edu