Platelet-Rich Plasma as a Treatment For Patellar Tendinopathy: A Double-Blind Randomized Controlled Trial

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INTRODUCTION:
Patellar tendinopathy is difficult to treat. Previous research has shown that in patients with patellar tendinopathy, mean Victorian Institute of Sport Assessment (VISA), Visual Analog Scale (VAS), and Tegner scores improved after treatment with two or three platelet-rich plasma (PRP) injections. A randomized controlled trial has also shown improvement in elbow tendinopathy at one year and at two years after PRP. However, there have been no random controlled trials comparing treatment with PRP to dry needling alone in patellar tendinopathy.

METHODS:
12 patients with patellar tendinopathy on clinical exam and MRI imaging, and who had failed six weeks of physical therapy, were enrolled in a double-blind randomized controlled trial comparing dry needling with PRP to dry needling alone. Treatment groups consisted of either dry needling plus ultrasound-guided PRP injection (PRP group, n=7) or dry needling alone (dry needling group, n=5). Both groups also completed a standardized 5-phase program of eccentric exercises three times per week to return to full activity. Participants completed the VAS pain scale, VISA score for patellar tendinopathy, Tegner activity scale, Lysholm knee scale, and SF-12 questionnaire before and at three, six, nine, and 12 weeks after the intervention. All survey data were analyzed using two-tailed paired T-tests and intention to treat. All patients and researchers remained blinded throughout the 12-week follow-up period.

RESULTS:
All participants were male, and had a mean age of 37 (range 19-61), height of 71 inches (64-75), and weight of 186 lbs (135-222). No statistically significant difference in demographics was found between groups, indicating successful randomization.

Within the PRP group, we observed clinically and statistically significant improvements by a mean of 31 points for VISA (p=0.02), 2.4 points for VAS (p=0.01), and 36 for Lysholm (p=0.02). The PRP group showed a clinically significant improvement of 2.1 points for Tegner (p=0.27), and a decrease in SF-12 of 0.8 points (p=0.84).

Within the dry Needling group, scores improved by 30 points for Lysholm (p=0.26) and by 1.1 points for VAS (p=0.68), but worsened by 1.6 points for Tegner (p=0.27), by 6 points for VISA (p=0.89), and by 3.9 points for SF-12 (p=0.06) at 12 weeks.

Between-groups comparisons showed a clinically and statistically significant 37-point greater improvement in VISA scores in the PRP group relative to the dry needling group (p=0.046), and a clinically significant 3.7-point greater improvement in Tegner scores (p=0.20). There were no clinically or statistically significant differences between groups for the Lysholm, VAS, or SF-12 scores.

DISCUSSION:
Published literature suggests the minimum clinically significant difference is 12 points for VISA, 1 point for Tegner, 10 points for Lysholm, 2 points for VAS, and 6.8 points for SF-12. Thus, our results indicate that a therapeutic regimen of eccentric exercise and ultrasound-guided PRP injection leads to clinically significant improvement in activity (Tegner), function and stability (Lysholm), pain (VAS), and symptoms (VISA) at 12 weeks. Furthermore, we have shown that this regimen is both clinically and statistically significantly better than exercises and dry needling alone based on VISA score of patellar tendinopathy symptoms. This supports existing evidence that PRP may accelerate healing time following tendon injuries, and provides additional evidence that PRP treatment leads to better patient-reported clinical outcomes than alternatives.

Although previous reports have suggested a positive effect of dry needling, our results indicate that dry needling without PRP did not improve outcomes, and led to a clinically significant decrease in activity based on Tegner score.

SIGNIFICANCE:
Our results indicate that when combined with eccentric exercises, PRP is an effective treatment for patellar tendinopathy, and is more effective than alternatives such as dry-needling. This research suggests that PRP should be considered as a treatment option for patients with patellar tendinopathy.

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