Optimized platelet-rich plasma treatment protocol for patients with chronic lateral epicondylitis: a randomized, double-blind, placebo-controlled trial

Ji Sup Hwang[1], Jihyeung Kim
[1]Seoul National University Hospital

INTRODUCTION:
Previous studies have suggested platelet-rich plasma (PRP) to be a safe and effective therapy for lateral epicondylitis. Although PRP preparation protocols vary, no study has compared their effect. In the setting of a randomized, placebo-controlled trial, we compared high-speed PRP, low-speed PRP, and saline injections in the treatment of lateral epicondylitis with respect to: (1) VAS pain scores, and (2) functional outcomes (DASH score and grip strength) 6 months after treatment.
METHODS:
We performed a parallel-group, randomized, controlled participant- and assessor-blinded study including adults with clinically diagnosed lateral epicondylitis. We defined epicondylitis as pain in the lateral humeral epicondyle area exacerbated during resisted wrist extension and epicondyle compression, and determined chronicity for pain that has lasted over six months. Patients with other concomitant upper-limb symptoms and surgical treatment of the elbow were excluded. We randomized 120 participants to receive an injection of high-speed PRP, low-speed PRP, or saline (1:1:1) in the proximal insertion of the common extensor tendon. To prepare the PRP, we collected venous blood with a syringe kit followed by centrifugation, which was done at 4000rpm for the high-speed PRP and 1500rpm for the low-speed PRP. One unblinded investigator gave injections while the participant was unable to see the injection. Remaining half of the PRP was evaluated for TGF-beta and PDGF concentration. There was no formal postinjection rehabilitation protocol and the use of NSAIDs was similar between different treatment arms. Follow-up visits were at 2, 8, 12, 24 weeks after the injection. The primary outcome measure was improvement in pain, measured with VAS scale from baseline to 52 weeks. The secondary outcomes were the DASH score and grip strength.
RESULTS:
At 24 weeks, the mean difference in the VAS score for pain was -1.8 (95% CI -2.5 to -1.1; p = 0.04) for high-speed PRP versus low-speed PRP and -0.2 (95% CI -0.7 to 1.4; p = 0.35) for low-speed PRP versus saline. The corresponding mean differences in the DASH score were -7.4 (95% CI -16.2 to -1.3; p = 0.03) and 7.7 (95% CI -1.3 to 16.7; p = 0.09) and those for grip strength were 1.8 kg (95% CI -3.3 to 6.1; p = 0.52) and 0.2 kg (95% CI -5.0 to 4.5; p = 0.88). No statistically significant difference was found in the TGF-beta and PDGF level between high-speed and low-speed PRP. No complications occurred because of the injections.
DISCUSSION AND CONCLUSION:
High-speed PRP was superior to both low-speed PRP and saline with regard to pain reduction in lateral epicondylitis at the primary end point at 6 months. Although growth factor levels failed to explain the superior effect of the high-speed PRP, an optimized PRP treatment might be effective for chronic lateral epicondylitis.