

Review Article

Platelet-Rich Plasma Versus Corticosteroid Injection in Chronic Lateral Epicondylitis

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Abstract

Background: Corticosteroid injection provides rapid short-term relief of chronic lateral epicondylitis but is repeatedly associated with symptom recurrence, while platelet-rich plasma (PRP) has been promoted as a disease-modifying alternative.**Objective:** To synthesise randomised and meta-analytic evidence comparing PRP and corticosteroid injection across short- and long-term outcomes, recurrence, PRP preparation heterogeneity, and alternative injectates.**Methods:** Narrative review of randomised controlled trials, systematic reviews, and meta-analyses identified through PubMed/Cochrane-indexed literature.**Findings:** Corticosteroid produces superior pain and function at 4-8 weeks, but a crossover by 3-6 months leaves PRP with significantly better VAS, DASH, and PRTEE outcomes and lower recurrence at 1-2 years. Leukocyte-poor preparations and higher platelet concentration factors appear to improve PRP efficacy; autologous blood and dry needling show intermediate profiles.**Conclusions:** PRP offers superior sustained outcomes beyond six months despite a slower onset, supporting its selective use over corticosteroid in chronic, recalcitrant disease.**Keywords:** Platelet-rich plasma; Corticosteroid injection; Lateral epicondylitis; Tennis elbow; Tendinopathy

Abstract

Background: Corticosteroid injection provides rapid short-term relief of chronic lateral epicondylitis but is repeatedly associated with symptom recurrence, while platelet-rich plasma (PRP) has been promoted as a disease-modifying alternative. **Objective:** To synthesise randomised and meta-analytic evidence comparing PRP and corticosteroid injection across short- and long-term pain and functional outcomes, recurrence, PRP preparation heterogeneity, and alternative injectates. **Methods:** Narrative review of randomised controlled trials, systematic reviews, and meta-analyses identified through PubMed/Cochrane-indexed literature. **Findings:** Corticosteroid produces superior pain and function at 4-8 weeks, but multiple trials and meta-analyses show a crossover by 3-6 months, with PRP producing significantly better VAS, DASH, and PRTEE outcomes and lower recurrence at 1-2 years. Leukocyte-poor preparations and higher platelet concentration factors appear to improve PRP efficacy. Autologous blood and dry needling show intermediate profiles. **Conclusions:** PRP offers superior sustained outcomes beyond six months despite a slower onset, supporting its selective use over corticosteroid in chronic, recalcitrant disease.

Keywords: platelet-rich plasma; corticosteroid injection; lateral epicondylitis; tennis elbow; tendinopathy

Introduction

Lateral epicondylitis, commonly termed tennis elbow, is a degenerative tendinopathy of the common extensor origin, principally the extensor carpi radialis brevis, rather than a true inflammatory "-itis." Population-based surveys estimate its prevalence at approximately 1-3% in working-age adults, with peak incidence between the fourth and fifth decades and strong associations with repetitive forceful wrist extension and smoking [1]. Most cases are self-limiting, but a substantial minority progress to chronic, recalcitrant pain lasting beyond six months, for

which injection therapy remains a common second-line intervention after activity modification, bracing, and physiotherapy fail.

Corticosteroid injection has long been favoured for its rapid analgesic effect, but landmark trials demonstrated that this benefit is transient and, paradoxically, associated with worse intermediate- and long-term outcomes than physiotherapy or even a wait-and-see policy, implicating an adverse effect on tendon biology rather than genuine healing [2,3,4]. A broader systematic review of corticosteroid injection across multiple tendinopathies confirmed this pattern of short-term benefit reversing to long-term harm relative to placebo [5]. These findings catalysed interest in autologous biologic injectates, particularly PRP, which concentrates platelet-derived growth factors thought to stimulate tenocyte proliferation, collagen synthesis, and neovascularisation, thereby targeting the underlying angiofibroblastic degeneration rather than merely suppressing pain [6]. Diagnosis is clinical, based on point tenderness over the lateral epicondyle and pain reproduced by resisted wrist or middle-finger extension, with imaging reserved for atypical or refractory presentations. Outcome measurement across the injection literature is dominated by three complementary instruments: the visual analogue scale (VAS) for pain intensity, the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire for global upper-limb function, and the Patient-Rated Tennis Elbow Evaluation (PRTEE), a condition-specific composite of pain and disability subscales. Because these instruments are scored, timed, and reported inconsistently across trials, and because PRP itself is prepared by a range of commercial and in-house protocols that differ in platelet concentration factor and leukocyte content, comparative interpretation of the injection literature requires explicit attention to preparation method and follow-up duration rather than pooled headline effect sizes alone. This review

synthesises randomised and meta-analytic evidence comparing PRP and corticosteroid injection for chronic lateral epicondylitis, with attention to the time-course of pain and function (VAS, DASH, PRTEE), recurrence, PRP preparation heterogeneity, and comparison with autologous blood, dry needling, and other injectates.

Short-Term Outcomes: The Corticosteroid Advantage

Across nearly all comparative trials, corticosteroid injection produces faster and often numerically superior symptom relief in the first four to eight weeks. In a three-way randomised trial of corticosteroid, dry needling, and PRP, corticosteroid achieved the lowest VAS scores at three months among the three arms, with dry needling intermediate and PRP slowest to respond [7]. A four-arm placebo-controlled trial found corticosteroid superior to PRP, hyaluronic acid, and saline only in the first month, after which the advantage dissipated [8]. This early-superiority pattern is corroborated by systematic synthesis: an updated meta-analysis of thirteen level 1-2 studies confirmed corticosteroid superiority at one month post-injection [9] (Table 1), and a further meta-analysis of eleven randomised trials similarly reported better corticosteroid-arm function under two months [10]. Mechanistically, corticosteroid's rapid local anti-inflammatory and analgesic action explains this early separation, whereas PRP requires a biological cascade of growth-factor release, cellular recruitment, and matrix remodelling that unfolds over weeks to months before clinical benefit becomes apparent [11].

Long-Term Outcomes and Recurrence

The clinically decisive divergence occurs beyond three to six months. Peerbooms and colleagues' double-blind randomised trial reported that at one year, treatment success ($\geq 25\%$ reduction in VAS or DASH without re-intervention) was achieved by 73% of PRP-treated patients versus 51% of corticosteroid-treated patients for

DASH ($P=.005$), with baseline VAS falling from 70.1 to 25.3 in the PRP group versus 65.8 to 50.1 with corticosteroid [12]. Two-year follow-up of the same cohort showed the gap widening rather than narrowing: DASH success reached 72.5% with PRP versus 38.8% with corticosteroid, and mean VAS was 21.3 (PRP) versus 42.4 (corticosteroid), with corticosteroid-group scores having drifted back toward baseline (Figure 1, Figure 2) [13]. A separate double-blind, placebo-controlled Danish trial similarly found no benefit of either PRP or glucocorticoid over saline at three months, but longer profiling again favoured biologic recovery trajectories over the steroid arm's regression [14]. Pooled analyses corroborate this time-dependent crossover: an eleven-trial meta-analysis concluded corticosteroid gives better short-term (<2 months) function while PRP gives superior long-term (≥ 6 months) pain relief and function [10], and the Hohmann meta-analysis found PRP more effective at three and six months despite corticosteroid's one-month advantage, while cautioning that risk of bias in included trials limits firm recommendations [9]. Systematic review of overlapping meta-analyses similarly concluded PRP outperforms corticosteroid at intermediate-to-long-term follow-up despite heterogeneous methodology across the underlying reviews [15]. Ultrasonographic correlates parallel these clinical trajectories: recalcitrant-epicondylitis cohorts receiving corticosteroid showed progressive tendon thinning and cortical erosion, while PRP-treated tendons showed thickening consistent with biological repair, alongside lower six-month symptom recurrence [16,17].

Table 1: Selected randomized controlled trials comparing platelet-rich plasma, corticosteroid, and related injectates for chronic lateral epicondylitis.				
Study	Comparison	Design	Follow-up	Key outcome
Peerbooms 2010	PRP vs corticosteroid	Double-blind RCT	1 year	DASH success 73% PRP vs 51% corticosteroid

Study	Comparison	Design	Follow-up	Key outcome
Gosens 2011	PRP vs corticosteroid	Double-blind RCT (2-yr extension)	2 years	DASH success 72.5% PRP vs 38.8% corticosteroid
Krogh 2013	PRP vs glucocorticoid vs saline	Double-blind placebo-controlled RCT	3 months	No superiority of PRP or glucocorticoid over saline at 3 months
Thanasis 2011	PRP vs autologous blood	RCT	6 months	PRP superior VAS at 6 months; similar DASH
Mishra 2014	Leukocyte-enriched PRP vs active control	Multicenter double-blind RCT	24 weeks	71.5% pain improvement PRP vs 56.1% control at 24 weeks
Arik 2014	Autologous blood vs corticosteroid	RCT	90 days	95% complete recovery autologous blood vs 62.5% corticosteroid
Güngör 2022	Corticosteroid vs dry needling vs PRP	RCT	3 months	Corticosteroid lowest VAS at 3 months; PRP slowest responder
Dejneke 2025	PRP vs corticosteroid vs hyaluronic acid vs saline	Placebo-controlled RCT	52 weeks	Corticosteroid advantage limited to month 1; no difference vs placebo by 6 months

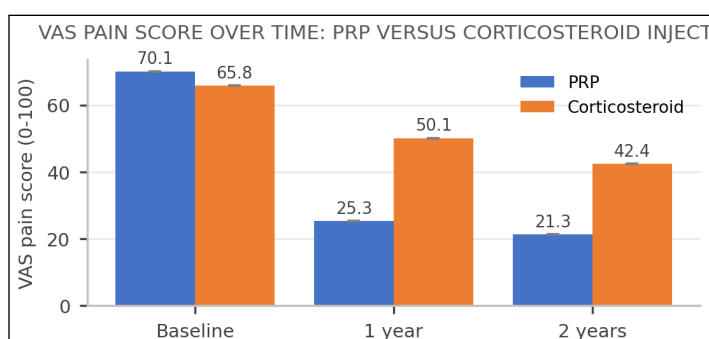


Figure 1: Mean VAS pain score (0-100) at baseline, 1 year, and 2 years for platelet-rich plasma versus corticosteroid injection in chronic lateral epicondylitis, from a double-blind randomized controlled trial with 2-year follow-up [12,13].

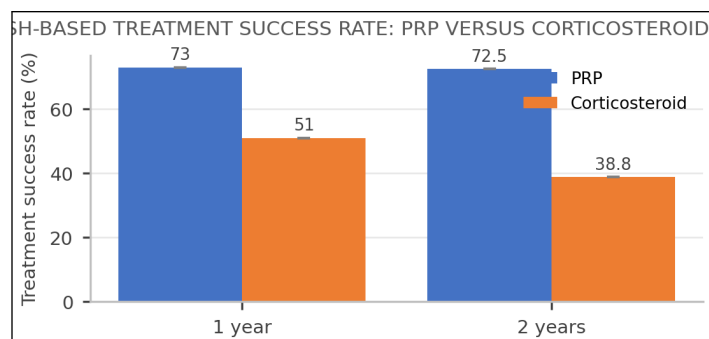


Figure 2: DASH-based treatment success rate (proportion achieving ≥25% reduction in DASH score without re-intervention) at 1 and 2 years for platelet-rich plasma versus corticosteroid injection [12,13].

Not all evidence favours PRP unreservedly. The 2021 Cochrane review pooling 32 trials (2,337 participants) concluded that autologous blood or PRP injections "probably provide little or no clinically important benefit" over placebo at three months, and showed no clinically meaningful advantage over corticosteroid either, though most included trials were small and at risk of bias [18]. This tempers otherwise favourable single-trial and meta-analytic signals and underscores substantial between-study heterogeneity in PRP preparation, injection technique, and outcome definitions.

A head-to-head comparison of PRP against autologous whole blood, its unfractionated precursor, found PRP produced significantly better six-month VAS pain scores with comparable DASH improvement, indicating that platelet concentration itself, not merely autologous injection, contributes to outcome [19]. A separate meta-analysis of seven randomised trials (515 patients) similarly found PRP statistically superior to corticosteroid in pain and function at six months with equivalent adverse-event rates [20].

PRP Preparation Heterogeneity: Leukocyte Content and Platelet Dose

PRP is not a standardised product, and leukocyte concentration is a key axis of variability. A randomised comparison of leukocyte-rich versus leukocyte-poor PRP

found no significant between-group differences in VAS or Patient-Rated Tennis Elbow Evaluation (PRTEE) scores at eight weeks, with both formulations improving similarly on exercise co-therapy [21]. In contrast, a more recent double-blind trial incorporating single-cell platelet analysis found leukocyte-poor PRP produced significantly greater pain reduction and functional improvement than leukocyte-rich PRP or saline at six weeks, sustained to 55 weeks (Table 2) [22]. Platelet dose independent of leukocyte content also matters: a meta-regression of thirteen trials found that platelet concentration factor explained 58.5% of between-study variance in outcome, with only "high-dose" PRP (>3-fold whole-blood concentration) achieving clinically meaningful pain reduction (mean VAS difference -1.31) [23]. A minimal-clinically-important-difference-based meta-analysis of 26 studies found VAS, DASH, and Mayo Elbow scores met MCID thresholds throughout follow-up to 104 weeks regardless of leukocyte content, suggesting genuine effect sizes are being diluted, rather than negated, by preparation heterogeneity in pooled analyses [24].

Table 2: Studies addressing platelet-rich plasma preparation heterogeneity (leukocyte content and platelet dose) in lateral epicondylitis.			
Study	Comparison	Follow-up	Key finding
Yerlikaya 2018	Leukocyte-rich vs leukocyte-poor PRP vs saline	8 weeks	No significant between-group difference in VAS or PRTEE
Walecka 2026	Leukocyte-poor vs leukocyte-rich PRP vs saline	55 weeks	Leukocyte-poor PRP superior pain reduction and function
Oeding 2025	Platelet dose meta-regression (13 RCTs)	Pooled, variable	Platelet concentration factor explains 58.5% of outcome variance; high dose (>3x) needed for benefit
Niemiec 2022	PRP (mixed leukocyte content), MCID-based meta-analysis (26 studies)	Up to 104 weeks	VAS, DASH, Mayo scores met MCID throughout follow-up regardless of leukocyte content

Comparison with Autologous Blood and Other

Injectates

Autologous whole blood, PRP's biologically simpler precursor, has also outperformed corticosteroid long-term: a randomised trial found 95% complete recovery with autologous blood versus 62.5% with corticosteroid, despite corticosteroid's faster initial relief [25]. A network meta-analysis integrating PRP, autologous blood, and steroid trials found PRP superior for pain control with a safety profile comparable to steroid, while autologous blood produced the greatest functional gains but carried higher local complication rates (relative risk 1.78) [26]. Comparative work against non-injection interventions reinforces that injections alone are not curative: physiotherapy combined with, or in place of, corticosteroid outperformed corticosteroid alone at one year, with corticosteroid-only patients showing the highest relapse rates [3,4], and two-decades-old evidence already showed a wait-and-see policy outperforming corticosteroid injection at 52 weeks despite corticosteroid's clear early superiority at six weeks, a pattern that anticipated the later PRP-versus-corticosteroid crossover by a decade [2]. Dry needling, which mechanically disrupts degenerated tendon to stimulate a localised healing response without introducing any injectate, produced short-term pain relief statistically indistinguishable from corticosteroid and superior functional trajectory to PRP in one three-arm trial, suggesting that mechanical stimulation of the tendon may itself contribute meaningfully to outcome independent of the substance injected [7].

Discussion

The consistent pattern across sources is a therapeutic crossover: corticosteroid's rapid anti-inflammatory action gives way, from roughly three months onward, to a rebound characterised by tendon degeneration and symptom recurrence, whereas PRP's slower, biologically mediated recovery yields durable gains sustained to at

least two years [12,13,10]. This has direct clinical implications: corticosteroid may still suit patients prioritising rapid short-term relief (e.g., before a defined event), whereas PRP is preferable for patients with chronic, recalcitrant disease in whom durable one-to-two-year outcomes are the priority. However, the Cochrane review's more skeptical pooled estimate [18], alongside evidence that outcomes depend heavily on leukocyte content and platelet dose [22,23], means PRP cannot be recommended as a uniform "one-size-fits-all" biologic; preparation standardisation (leukocyte-poor, high platelet-concentration-factor protocols) appears necessary to reproduce the superior outcomes seen in the strongest individual trials.

Conclusion

Corticosteroid injection provides faster but non-durable relief of chronic lateral epicondylitis, while PRP, particularly leukocyte-poor and high-platelet-dose formulations, produces superior VAS, DASH, and PRTEE outcomes and lower recurrence from approximately six months through at least two years, albeit with a slower onset and continued heterogeneity across preparations and trials. Clinicians should weigh timeframe of expected benefit, recurrence risk, and PRP standardisation when selecting between these two widely used injectates, and future trials should adopt uniform PRP preparation reporting to resolve residual heterogeneity in the evidence base.

References

1. Shiri, R., Viikari-Juntura, E., Varonen, H., Heliövaara, M. (2006) Prevalence and determinants of lateral and medial epicondylitis: a population study. *American Journal of Epidemiology*, 164(11): 1065-1074.
2. Smidt, N., van der Windt, D.A., Assendelft, W.J., Devillé, W.L., Korthals-de Bos, I.B., Bouter, L.M. (2002) Corticosteroid injections, physiotherapy, or a wait-and-see policy for lateral epicondylitis: a randomised controlled trial. *Lancet*, 359(9307): 657-662.
3. Bisset, L., Beller, E., Jull, G., Brooks, P., Darnell, R., Vicenzino, B. (2006) Mobilisation with movement and exercise, corticosteroid injection, or wait and see for tennis elbow: randomised trial. *British Medical Journal*, 333(7575): 939-941.
4. Coombes, B.K., Bisset, L., Brooks, P., Khan, A., Vicenzino, B. (2013) Effect of corticosteroid injection, physiotherapy, or both on clinical outcomes in patients with unilateral lateral epicondylalgia: a randomized controlled trial. *JAMA*, 309(5): 461-469.
5. Coombes, B.K., Bisset, L., Vicenzino, B. (2010) Efficacy and safety of corticosteroid injections and other injections for management of tendinopathy: a systematic review of randomised controlled trials. *Lancet*, 376(9754): 1751-1767.
6. Mishra, A., Pavelko, T. (2006) Treatment of chronic elbow tendinosis with buffered platelet-rich plasma. *American Journal of Sports Medicine*, 34(11): 1774-1778.
7. Güngör, E., Karakuzu Güngör, Z. (2022) Comparison of the efficacy of corticosteroid, dry needling, and PRP application in lateral epicondylitis. *European Journal of Orthopaedic Surgery & Traumatology*, 32(8): 1569-1575.
8. Dejneke, M., Królikowska, A., Kowal, M., Reichert, P. (2025) Comparative efficacy of platelet-rich plasma, corticosteroid, hyaluronic acid, and placebo (saline) injections in patients with lateral elbow tendinopathy: a randomized controlled trial. *Journal of Clinical Medicine*, 14(2): 472.
9. Hohmann, E., Tetsworth, K., Glatt, V. (2023) Corticosteroid injections for the treatment of lateral epicondylitis are superior to platelet-rich plasma at 1 month but platelet-rich plasma is more effective at 6 months: an updated systematic review and meta-analysis of level 1 and 2 studies. *Journal of Shoulder and Elbow Surgery*, 32(9): 1770-1783.
10. Xu, Y., Li, T., Wang, L., Yao, L., Li, J., Tang, X. (2024)

Platelet-rich plasma has better results for long-term functional improvement and pain relief for lateral epicondylitis: a systematic review and meta-analysis of randomized controlled trials. *American Journal of Sports Medicine*, 52(10): 2646-2656.

11. Mishra, A.K., Skrepnik, N.V., Edwards, S.G., Jones, G.L., Sampson, S., Vermillion, D.A., Ramsey, M.L., Karli, D.C., Rettig, A.C. (2014) Efficacy of platelet-rich plasma for chronic tennis elbow: a double-blind, prospective, multicenter, randomized controlled trial of 230 patients. *American Journal of Sports Medicine*, 42(2): 463-471.
12. Peerbooms, J.C., Sluimer, J., Bruijn, D.J., Gosens, T. (2010) Positive effect of an autologous platelet concentrate in lateral epicondylitis in a double-blind randomized controlled trial: platelet-rich plasma versus corticosteroid injection with a 1-year follow-up. *American Journal of Sports Medicine*, 38(2): 255-262.
13. Gosens, T., Peerbooms, J.C., van Laar, W., den Ouden, B.L. (2011) Ongoing positive effect of platelet-rich plasma versus corticosteroid injection in lateral epicondylitis: a double-blind randomized controlled trial with 2-year follow-up. *American Journal of Sports Medicine*, 39(6): 1200-1208.
14. Krogh, T.P., Fredberg, U., Stengaard-Pedersen, K., Christensen, R., Jensen, P., Ellingsen-Dalskau, L.H. (2013) Treatment of lateral epicondylitis with platelet-rich plasma, glucocorticoid, or saline: a randomized, double-blind, placebo-controlled trial. *American Journal of Sports Medicine*, 41(3): 625-635.
15. Houck, D.A., Kraeutler, M.J., Thornton, L.B., McCarty, E.C., Bravman, J.T. (2019) Treatment of lateral epicondylitis with autologous blood, platelet-rich plasma, or corticosteroid injections: a systematic review of overlapping meta-analyses. *Orthopaedic Journal of Sports Medicine*, 7(3): 2325967119831052.
16. Gautam, V.K., Verma, S., Batra, S., Bhatnagar, N., Arora, S. (2015) Platelet-rich plasma versus corticosteroid injection for recalcitrant lateral epicondylitis: clinical and ultrasonographic evaluation. *Journal of Orthopaedic Surgery*, 23(1): 1-5.
17. Ben-Nafa, W., Munro, W. (2018) The effect of corticosteroid versus platelet-rich plasma injection therapies for the management of lateral epicondylitis: a systematic review. *SICOT-J*, 4: 11.
18. Karjalainen, T.V., Silagy, M., O'Bryan, E., Johnston, R.V., Cyril, S., Buchbinder, R. (2021) Autologous blood and platelet-rich plasma injection therapy for lateral elbow pain. *Cochrane Database of Systematic Reviews*, 9(9): CD010951.
19. Thanasas, C., Papadimitriou, G., Charalambidis, C., Paraskevopoulos, I., Papanikolaou, A. (2011) Platelet-rich plasma versus autologous whole blood for the treatment of chronic lateral elbow epicondylitis: a randomized controlled clinical trial. *American Journal of Sports Medicine*, 39(10): 2130-2134.
20. Xu, Q., Chen, J., Cheng, L. (2019) Comparison of platelet rich plasma and corticosteroids in the management of lateral epicondylitis: a meta-analysis of randomized controlled trials. *International Journal of Surgery*, 67: 37-46.
21. Yerlikaya, M., Talay Çalış, H., Tomruk Sütbeyaz, S., Sayan, H., İbiş, N., Koç, A., Karakükçü, Ç. (2018) Comparison of effects of leukocyte-rich and leukocyte-poor platelet-rich plasma on pain and functionality in patients with lateral epicondylitis. *Archives of Rheumatology*, 33(1): 73-79.
22. Wałęcka, J., Bąkowski, P., Jokiel, M., Trąbka, R., Chaszczewska-Markowska, M., Ghete, D., Gurda-Woźna, D., Fedoruk-Wyszomirska, A., Lubiowski, P., Wyszko, E., Tyczewska, A., Bąkowska-Żywicka, K. (2026) Molecular background behind lateral elbow pain reduction with leukocyte-rich and leukocyte-poor platelet-rich plasma: randomized control trial and single-cell platelet analysis. *International Orthopaedics*, 50(2): 495-508.

23. Oeding, J.F., Varady, N.H., Messer, C.J., Dines, J.S., Williams, R.J., Rodeo, S.A. (2025) Platelet concentration explains variability in outcomes of platelet-rich plasma for lateral epicondylitis: a high dose is critical for a positive response. A systematic review and meta-analysis with meta-regression. *American Journal of Sports Medicine*, 53(10): 2489-2496.
24. Niemiec, P., Szyluk, K., Jarosz, A., Iwanicki, T., Balcerzyk, A. (2022) Effectiveness of platelet-rich plasma for lateral epicondylitis: a systematic review and meta-analysis based on achievement of minimal clinically important difference. *Orthopaedic Journal of Sports Medicine*, 10(4): 23259671221086920.
25. Arik, H.O., Kose, O., Guler, F., Deniz, G., Egerci, O.F., Ucar, M. (2014) Injection of autologous blood versus corticosteroid for lateral epicondylitis: a randomised controlled study. *Journal of Orthopaedic Surgery*, 22(3): 333-337.
26. Arirachakaran, A., Sukthuyat, A., Sisayanarane, T., Laoratanavoraphong, S., Kanchanatawan, W., Kongtharvonskul, J. (2016) Platelet-rich plasma versus autologous blood versus steroid injection in lateral epicondylitis: systematic review and network meta-analysis. *Journal of Orthopaedics and Traumatology*, 17(2): 101-112.