International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 9, September 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.9.2024.11

ORIGINAL RESEARCH

Role of corticosteroid (Methyl Prednisolone Injection) Versus Platelet Rich Plasma (PRP) in Treatment of Plantar Fasciitis

[1]Dr. Govind Sharma, [2]Dr. Abhishek Gupta, [3]Dr. Abdul Sabur Choudhary

[1,2]Assistant Professor, [3]Resident, Department of Orthopedics, F.H Medical College, Agra, India

Corresponding Author
Dr. Abhishek Gupta
Assistant Professor, Department of Orthopedics, F.H Medical College, Agra, India

Received Date: 25 July, 2024 Accepted Date: 26 August, 2024

Abstract:
Introduction: Plantar fasciitis (PF) is not an uncommon cause of heel pain whose treatment is not yet standardized. Although platelet rich plasma (PRP) and corticosteroid (CS) injections are the two commonly used modalities, yet not much importance has been given to the comparison of their roles in sustained functional improvement.
Aim: To study the effect of PRP and CS injections in PF and compare their effectiveness with respect to pain relief and improvement of functional and patient satisfaction.
Material & methods: 50 cases were randomized into two groups: 25 patients (Group A) received a single injection of autologous PRP and 25 in Group B received a single injection of CS (40 mg of methylprednisolone) by the random selection. A structured home exercise program was demonstrated to both the groups, as baseline management. The effectiveness was assessed and compared in pre-injection and post-injection at 3 and 6 months follow-up. Visual Analog Scale (VAS), Roles and Maudsley (RM), and Foot Function Index (FFI) scoring systems were used as outcome measures.
Results: Mean ± SD of age was calculated to be, 42.31 ± 7.6 for Group A and 42.29 ± 8.0 for Group B. Most of the participants in Group A [16 (64%)] & in Group B [15 (60%)] were females Mean VAS score at different follow up time reveals, at 3rd month (Mean VAS 3.05 & 4.82 in group A & B respectively) and 6th month later (Mean VAS 1.67 & 4.12 in group A & B respectively) follow up period, significant improvement was found in group A. There was a significant improvement of FFI and RM score as well as at 6 months follow-up (P = <0.001).
Conclusion: Injection of CS had an early effect, which is not sustainable, whereas PRP was found to have a prolonged impact on pain relief and better patient satisfaction with treatment outcomes. Therefore, PRP can be advised for sustained and prolonged improvement in PF.

Keywords: Corticosteroid, Injection, Plantar fasciitis, Platelet-rich plasma.

Introduction:

A common presenting issue in the foot and ankle practice is heel discomfort. The most typical cause of heel pain is plantar fasciitis (PF). Women and people in their middle years tend to experience it more frequently [1-2]. There is an annual variation in the prevalence of PF, ranging from 3.83 to 10.5/1000 population, with a higher incidence in females. [3–4] Heel pain is linked to an increased risk of ageing and having a high body mass index.[5]

Usually, the worst pain occurs right after a period of rest or during the first steps of the day. Additionally, bending the foot and toes up towards the shin frequently causes pain, which can be exacerbated by a taut Achilles tendon. Usually, the illness advances slowly. In almost one-third of cases, both legs are impacted. Usually, neither fevers nor sweats occur at night. Overuse, such as from prolonged standing, increased exercise, and obesity are risk factors [6].

Plantar fasciitis is a pathophysiologically related condition characterised by micro rips, collagen breakdown, and scarring at the ligament's insertion location on the bone [6]. Many believe the condition should be called plantar fasciosis because inflammation is not as important as it formerly was [7]. Ultrasonography is occasionally used to aid in the diagnosis, which is usually made based on signs and symptoms.

The treatment of plantar fasciitis (PF) involves the use of therapeutic modalities like extracorporeal shock-wave therapy (ESWT), stretching exercises for the plantar fascia and Achilles tendon, night splints, shoe inserts, and medical managements like nonsteroidal anti-inflammatory drugs (NSAID),

DOI: 10.69605/ijlbpr_13.9.2024.11

local corticosteroid (CS) injection, platelet-rich plasma (PRP) injection, and prolotherapy [8].

There isn't agreement on which modality is the most efficient. Additionally, the results of several studies don't always agree [9]. While practitioners frequently employ CS and PRP to treat chronic PF, there is insufficient high-level data to support the reproducibility of CS results [10]. In treating PF, a Cochrane database systematic analysis comparing local steroid injection with placebo or no treatment has revealed a marginally reduced heel pain for a maximum of one month [11].

At long-term follow-up, a systematic review and meta-analysis have also revealed no differences in pain or function scores [12]. In contrast to inflammation, PF is thought to be a cumulative trauma condition involving a degenerative process. Consequently, PRP is theoretically better than CS because it has the ability to regenerate tissue [13]. Numerous studies have demonstrated the anti-inflammatory and regenerative qualities of platelet-rich plasma [14–15]. The research on the effectiveness of different PF treatment techniques reveals contradictory findings. While PRP and CS have been used in several trials to manage Parkinson's disease, relatively few of them have examined the two treatments' effects on patient satisfaction and functional progress.

The objective of the current study was to compare the efficacy of a single PRP injection against a CS injection for pain alleviation and functional improvement in chronic PF patients who were also enrolled in a structured home exercise program as baseline therapy.

Material & methods:

This interventional study was conducted at Department of Orthopedics from 15 January 2023 to 15 June 2023. Patients with heel pain at first steps in the morning or after a period of rest and sharp pain with the palpation of the medial plantar calcaneal region, aggravated with ankle and great toe dorsiflexion were diagnosed to have PF. Those patients between 18 and 60 years of age who did not respond to a minimum of 3 months of conservative treatment, including analgesics, stretching exercises, and night splint, were included in the study.

Those with a history of rheumatoid arthritis, gout, degenerative arthritis, neural entrapment syndromes, bleeding disorders, skin lesion on heel, pregnancy, malignancy, calcaneodynia secondary to injury or fracture, and cases with a prior history of local injection or any intervention within 6 months were excluded from the study. Patients with uncontrolled diabetic mellitus, anemia, low cognitive status, and those received NSAID 1 week before the study were also excluded.

Assuming that the patients presenting in the outpatient department randomly, every alternate patient was allotted to Group A, who were administered a single dose of autologous PRP Injection, and Group B, who received a single dose of CS (methylprednisolone) injection following simple randomization procedure, until the minimum sample size was met.

Sample Size Estimation:

The sample size determination has been done for the Chi square test of independence using G*Power 3.1.9.2 statistical power analysis with a biostatistician's help. The minimum sample size came out as 52 to achieve the power of the test of 0.80 for 0.05 level of α. A total of 58 patients were enrolled for the study, out of which 8 patients were lost to followup. Therefore, the final sample size was 50.

The intensity of plantar heel pain was measured by VAS using a ruler with anchor points 0 as no pain 10 as the worst possible pain [16-17]. Modified RM score was used to assess patient satisfaction and limitation of walking ability due to pain [18-20]. The function in terms of pain, disability, and activity restriction was measured using FFI, which is a patient related outcome questionnaire consisting of 23 items, divided into three subscales [21].

Procedure:

To prepare PRP, a double-centrifugation method was employed. In order to prevent platelet activation, about 15 ml of autologous peripheral venous blood was extracted traumatizingly. 1.5 ml of sodium citrate was then used to anticoagulate the blood. For peripheral blood, an initial platelet count was performed. In order to obtain a plasma sample with a higher concentration of platelets, or PRP, red blood cells were separated by first centrifuging at 2500 rpm for 15 minutes, and then centrifuging again at 3000 rpm for 5 minutes. A comparison was made between the initial platelet count and the total platelet count. After removing about 3 millilitres of pure PRP from the deeper layer, group A patients' plantar fascias were promptly injected with it. A CS solution was made using 1 millilitre of 2% and 40 mg of methylprednisolone and 1 ml of 2% lignocaine and injected locally in Group B patients.

The plantar fascia was injected using a conventional injection approach [22]. The afflicted leg was rotated externally, exposing the medial heel. A 25 G needle was used to inject the PRP or CS laterally onto the plantar area, slightly superior and anterior to the calcaneus, until it reached the periosteum. To prevent injecting into the plantar fat pad, caution was exercised. Both groups received demonstrations and explanations of a home exercise regimen for stretching the plantar fascia and Achilles tendon (three sets of each exercise for ten minutes, with ten repetitions in each set) [23].

Statistical analysis

IBM SPSS Statistics, 24.0 (IBM Corp., Bio-statistician) was used for the data analysis. Using the Chi-square and t-test of independence, the relationship between categorical variables such VAS, RM, and FFI scores that are categorised according to Group A and B was investigated. The mean VAS and FFI ratings were computed using a descriptive statistics approach, and the nonparametric Mann-Whitney U-test was used to compare the means

DOI: 10.69605/ijlbpr_13.9.2024.11

between the two groups. The cutoff "p" value for the statistical test of significance was set at less than 0.05.

Results:

Table 1: Demographic profile of the patients

Variable	Group A (PRP) n (%)	Group B(CS) n (%)	p value (Chi-square test)
Age group (years)			
31-40	6 (24%)	7 (28%)	
41-50	9 (36%)	10 (40%)	0.233
51-60	10 (40%)	8 (32 %)	
Mean Age (Mean ±SD) t test	42.31 ± 7.6	42.29 ± 8.0	0.914
Sex			
Female	16 (64%)	15 (60%)	0.525
Male	9 (36%)	10 (40%)	
Side			
Right	13 (52%)	10 (40%)	
Left	10 (40%)	12 (48%)	0.409
Bilateral	2 (8%)	3 (12%)	
BMI			
Non-Obese	9 (36%)	10 (40%)	0.862
Obese	16 (64%)	15 (60%)	

Table 1 presents the demographic profile of the patients. The mean age ± standard deviation was calculated as 42.31 ± 7.6 years for Group A and 42.29 ± 8.0 years for Group B. The p-value of 0.914 indicates that the age difference between the groups was not statistically significant. In both groups, the majority of participants were female: 16 (64%) in Group A and 15 (60%) in Group B. Regarding body mass index (BMI), 16 patients (64%) in Group A and 15 patients (60%) in Group B were classified as obese. The difference in BMI between the two groups was not statistically significant ($p > 0.05$).

Table 2: Distribution of the study patients by VAS score

VAS Score	Group A (PRP)	Group B (CS)	p value
Pre-treatment	8.2±0.6	8.0±0.8	0.064
Early postinjection	8.0±0.7	7.2±1.2	0.052
At 1st month	6.18± 1.2	5.29± 0.8	0.001*
At 3rd month	3.05± 0.6	4.82± 0.7	0.001*
At 6th month	1.67± 0.8	4.12 ± 1.2	0.001*

*= statistically significant, t test

Table 2 displays the mean VAS scores at various follow-up times. Prior to treatment, the mean VAS score was 8.52 in Group A and 8.46 in Group B. After one week of intervention, pain levels decreased in both groups, with Group B showing a slightly better improvement. At the three-month follow-up, the mean VAS scores were 3.05 for Group A and 4.82 for Group B. By the six-month follow-up, Group A showed a mean VAS score of 1.67, while Group B had a score of 4.12. Significant improvement was observed in Group A over the follow-up period.

Table 3: Comparison of Roles and Maudsley score at different stages between the two treatment groups

RMI score	Pre-treatment		At 3rd month		At 6th month	
	Group A n (%)	Group B n (%)	Group A n (%)	Group B n (%)	Group A n (%)	Group B n (%)
Excellent	0	0	7 (28%)	2 (8%)	17(68%)	6(24%)
Good	0	0	8 (32%)	9 (36%)	6 (24%)	14(56%)
Fair	16 (64%)	15 (60%)	10 (40%)	12 (48%)	2 (8%)	5 (20%)
Poor	9 (36%)	10 (40%)	0	2 (8%)	0	0
p value	0.442		0.026		< 0.001*	

*= statistically significant, Chi- square test.

Table 3 indicates that at baseline, both groups had low or fair RM scores with no significant difference between them (P = 0.442). However, after the intervention, a significant difference in RM scores emerged between the two groups at both 3 and 6 months, with P-values of 0.026 and 0.000, respectively. Both groups showed fair to

DOI: 10.69605/ijlbpr_13.9.2024.11

good functional improvement at 3 months. By the 6-month follow-up, Group A demonstrated significantly better functional outcomes and higher patient satisfaction in terms of movement compared to Group B.

Table 4: Comparison of mean foot function index score between the two treatment groups

FFI score	Group A Mean±SD	Group B Mean±SD	p value
Pre-treatment	174.2±18.0	172.4±19.7	0.524
At 1 month	132 ± 21	145 ± 18.5	0.421
At 3rd month	45.3±12.6	89.9±13.1	< 0.001*
At 6th month	12.0±5.7	84.1±16.2	< 0.001*

*= statistically significant, Mann Whitney U-test.

The comparison of mean FFI scores at various time intervals between the two treatment groups revealed a significant reduction in scores for both groups at the 3- and 6-month follow-ups (P = < 0.001). However, Group A consistently had significantly lower mean FFI scores compared to Group B, as shown in Table 4. No adverse events were reported in either group.

Discussion:

At the three- and six-month follow-ups, the PRP injection proved to be considerably more successful in relieving the severe to moderate pain experienced by the majority of CS (Group B) patients, according to the current study. The majority of these patients expressed satisfaction with the course of treatment, which included pain-free, limitless walking. Five hours after the injection, right before the patient was to leave the hospital, the early effects of both injections were measured. When combined with CS, lignocaine quickly produces a local anaesthetic effect that can continue for up to 30 to 60 minutes in its undiluted form.[24] More CS was seen in the effect evaluated five hours after injection. Lignocaine was not used in conjunction with PRP since it may directly affect platelet function, particularly platelet aggregation.[25] Furthermore, the effectiveness of PRP injection alone is higher than that of PRP injection plus local anaesthetic.[26].

The plantar fascia's hypervascularity limits access to a high concentration of platelets and other growth factors necessary for the body to heal itself. When platelets are directly injected into a lesion, platelet-derived growth factor, transforming growth factor beta, and endothelial growth factors are released, which speeds up the healing process of the injured tissue. PRP has well-established anti-inflammatory and antinociceptive properties in the literature [27–28]. Upon three- and six-months' follow-up, the injection of PRP in Group A patients in the current study demonstrated an antinociceptive impact through pain relief and functional improvement.

The current investigation confirms the meta-analysis of Chen et al. [29], which demonstrated considerable pain alleviation in the CS group at 1.5 and 3 months, but sustained pain relief in the PRP group at 12 weeks. Patients in group A have a substantially better advantage based on functional scores and patient satisfaction. In a meta-analysis, Yang et al.[30] found a comparable outcome with improved long-term pain alleviation after 24 weeks. On the other hand, there was no discernible difference between the two groups' RM and foot function scores.

According to the review study by Monto [31], PRP treatment may be an option to surgery for patients with severe chronic PF. The same author's comparative study [32] between PRP and CS revealed that the CS group's pain and function improved initially at three months, but at twelve months, their ratings returned to baseline.

Three weekly PRP injections were used in a study by Martinelli et al. to examine the safety and effectiveness of PRP in PF[18]. In 64% of the cases, the RM score at the 12-month follow-up was outstanding, and there were no side effects from repeated PRP injections. In the current study, 74% of cases treated with a single PRP treatment showed outstanding RM scores at the conclusion of the 6-month follow-up.

Whittaker et al.'s systematic review and meta-analysis [10], which comprised 47 trials, supports CS injection as a more effective treatment than other comparators for improving functional capacity and relieving pain. The study by Jain SK [33] and other systematic reviews and meta-analyses by Singh et al. [12] found no differences in pain or functional score between the PRP and CS groups at long-term follow-up. Babatunde et al.'s network meta-analysis [8] comparing the relative efficacy of several treatment approaches, including CS injection, produced an unclear outcome. Low-quality evidence was discovered in the Cochrane database of systematic reviews on the treatment of plantar heel pain[11], indicating that heel pain was modestly decreased with local CS injection up to one month but not beyond that. The treatment was compared with placebo or no treatment at all. Karls et al. offered a comparable observation [34].

In addition to PRP and CS, alternative treatment options for post-fibrosis (PF) that should not be disregarded include NSAIDs, physical therapy, ultrasound therapy, autologous whole blood, ESWT, dry needling, and botulinum toxin. Haibo Li et al.'s network meta-analysis [35] assessing the effectiveness of eight different treatment methods for PF showed that ESWT was the most effective treatment, ranking first. Conversely, PRP and botulinum toxin A continue

DOI: 10.69605/ijlbpr_13.9.2024.11

to be inadequate forms of therapy. As CS, Raeissadat et al [36] have demonstrated good outcomes using high-molecular-weight hyaluronic acid. Observations remain contentious even after a great deal of study on different PF treatment techniques has been conducted. To determine the best management strategies, more study on the fundamental pathophysiology of the condition with a bigger sample size is needed.

One of the study's limitations is that it used simple randomisation with a sample size of less than 100. The six-month trial period may not have been enough to fully investigate the long-term effects. There is no measurement of the home rehabilitation program's compliance or how it affects outcomes.

Conclusions:

Compared to platelet-rich plasma (PRP), corticosteroid (CS) has an early effect and reduces pain to a moderate degree. On the other hand, the effect is not long-lasting. PRP local injections are a novel, easily accessible, well-tolerated, long-lasting, and secure treatment option for plantar fasciitis. After comparing the long-term efficacy, we find that PRP therapy is a successful therapeutic approach. Nevertheless, two drawbacks of this treatment are the expense and the amount of time required to prepare the PRP. PRP has a longer-lasting effect than steroids, which have an immediate effect. At the 6-month follow-up, both patient satisfaction and foot function had significantly improved. PRP can therefore be recommended for a prolonged impact on chronic PF.

Reference:

1. Sahoo PK, Ujade NA, Das SP. Effectiveness of single injection of platelet-rich plasma over corticosteroid in the treatment of plantar fasciitis – A randomized, comparative study. J Musculoskelet Surg Res 2020; 4: 187-93
2. Sherpy N, Hammad M, Hagrass H, et al. Local injection of autologous platelet rich plasma compared to corticosteroid treatment of chronic plantar fasciitis patients: A clinical and ultrasonographic follow-up study. The Egyptian Rheumatologist 2016; 38, 247–252.
3. Rasenberg N, Bierma-Zeinstra SM, Bindels PJ, et al. Incidence, prevalence, and management of plantar heel pain: A retrospective cohort study in Dutch primary care. Br J Gen Pract 2019; 69: e801-8.
4. Scher DL, Belmont PJ Jr, Bear R, et al. The incidence of plantar fasciitis in the United States military. J Bone Joint Surg Am 2009; 91: 2867-72.
5. Hill CL, Gill TK, Menz HB, et al. Prevalence and correlates of foot pain in a population-based study: The North West Adelaide health study. J Foot Ankle Res 2008; 1: 2.
6. Beeson P. Plantar fasciopathy: revisiting the risk factors. Foot Ankle Surg 2014; 20(3): 160-165.
7. Jeswani T, Morlese J, McnallyEg getting to the heel of the problem: plantar fascia lesions, Clinradiol 2009; 64(9): 931-939.
8. Babatunde OO, Legha A, Littlewood C, et al. Comparative effectiveness of treatment options for plantar heel pain: A systematic review with network meta-analysis. Br J Sports Med 2019; 53: 182-94.
9. Uğurlar M, Sönmez MM, Uğurlar ÖY, et al. Effectiveness of four different treatment modalities in the treatment of chronic plantar fasciitis during a 36-month follow-up period: A randomized controlled trial. J Foot Ankle Surg Off Publ Am Coll Foot Ankle Surg 2018; 57: 913-8.
10. Whittaker GA, Munteanu SE, Menz HB, et al. Corticosteroid injection for plantar heel pain: A systematic review and meta-analysis. BMC MusculoskeletDisord 2019; 20: 378.
11. David JA, Sankarapandian V, Christopher PR, et al. Injected corticosteroids for treating plantar heel pain in adults. Cochrane Database Syst Rev 2017; 6: CD009348.
12. Singh P, Madanipour S, Bhamra JS, et al. A systematic review and meta-analysis of platelet-rich plasma versus corticosteroid injections for plantar fasciopathy. Int Orthop 2017; 41: 1169-81.
13. Hsiao MY, Hung CY, Chang KV, et al. Comparative effectiveness of autologous blood-derived products, shock-wave therapy and corticosteroids for treatment of plantar fasciitis: A network meta-analysis. Rheumatology (Oxford) 2015; 54: 1735-43.
14. Filardo G, Kon E, Di Matteo B, et al. Platelet-rich plasma injections for the treatment of refractory achilles tendinopathy: Results at 4 years. Blood Transfus 2014; 12: 533-40.
15. Descalzi F, Ulivi V, Cancedda R, et al. Platelet-rich plasma exerts antinociceptive activity by a peripheral endocannabinoid-related mechanism. Tissue Eng Part A 2013; 19: 2120-9.
16. Soraganvi P, Nagakiran KV, Raghavendra-Raju RP, et al. Is platelet-rich plasma injection more effective than steroid injection in the treatment of chronic plantar fasciitis in achieving long-term relief? Malays Orthop J 2019; 13: 8-14.
17. Raeissadat SA, Nouri F, Darvish M, et al. Ultrasound-guided injection of high molecular weight hyaluronic acid versus corticosteroid in management of plantar fasciitis: A 24-week randomized clinical trial. J Pain Res 2020; 13: 109-21.
18. Martinelli N, Marinozzi A, Carnì S, et al. Platelet-rich plasma injections for chronic plantar fasciitis. Int Orthop 2013; 37: 839-42.
19. Sun K, Zhou H, Jiang W. Extracorporeal shock wave therapy versus other therapeutic methods for chronic plantar fasciitis. Foot Ankle Surg 2020; 26: 33-8.
20. Vahdatpour B, Kianimehr L, Moradi A, Haghighat S. Beneficial effects of platelet-rich plasma on improvement of pain severity and physical disability in patients with plantar fasciitis: A randomized trial. Adv Biomed Res 2016; 5: 179.
21. Budiman-Mak E, Conrad KJ, Roach KE. The foot function index: A measure of foot pain and disability. J Clin Epidemiol 1991; 44: 561-70.
22. Physical Medicine and Rehabilitation 4th edition. Available from: https://www.elsevier.com/books/physical-medicine-and-rehabilitation/braddom/978-1-4377-0884-4. [Last accessed on 2023 May 14].
23. Digiovanni BF, Nawoczenski DA, Malay DP, et al. Plantar fascia-specific stretching exercise improves outcomes in patients with chronic plantar fasciitis. A prospective clinical trial with two-year follow-up. J Bone Joint Surg Am 2006; 88: 1775-81.

DOI: 10.69605/ijlbpr_13.9.2024.11

24. Donald MJ, Derbyshire S. Lignocaine toxicity; a complication of local anaesthesia administered in the community. Emerg Med J 2004; 21: 249-50.
25. Bausset O, Magalon J, Giraudo L, et al. Impact of local anaesthetics and needle calibres used for painless PRP injections on platelet functionality. Muscles Ligaments Tendons J 2014; 4: 18-23.
26. Carofino B, Chowaniec DM, McCarthy MB, et al. Corticosteroids and local anesthetics decrease positive effects of platelet-rich plasma: An In vitro study on human tendon cells. Arthroscopy 2012; 28: 711-9.
27. Barman A, Mukherjee S, Sahoo J, et al. Single intra-articular platelet-rich plasma versus corticosteroid injections in the treatment of adhesive capsulitis of the shoulder: A cohort study. Am J Phys Med Rehabil 2019; 98: 549-57.
28. Lee H-R, Park KM, Joung YK, Park KD, Do SH. Platelet-rich plasma loaded hydrogel scaffold enhances chondrogenic differentiation and maturation with up-regulation of CB1 and CB2. J Control Release Off J Control Release Soc 2012; 159: 332-7.
29. Chen YJ, Wu YC, Tu YK, et al. Autologous blood-derived products compared with corticosteroids for treatment of plantar fasciopathy: A systematic review and meta-analysis. Am J Phys Med Rehabil 2019; 98: 343-52.
30. Yang WY, Han YH, Cao XW, et al. Platelet-rich plasma as a treatment for plantar fasciitis: A meta-analysis of randomized controlled trials. Medicine (Baltimore) 2017; 96: e8475.
31. Monto RR. Platelet-rich plasma and plantar fasciitis. Sports Med Arthrosc Rev 2013; 21: 220-4.
32. Monto RR. Platelet-rich plasma efficacy versus corticosteroid injection treatment for chronic severe plantar fasciitis. Foot Ankle Int 2014; 35: 313-8.
33. Jain SK, Suprashant K, Kumar S, et al. Comparison of plantar fasciitis injected with platelet-rich plasma vs. corticosteroids. Foot Ankle Int 2018; 39: 780-6.
34. Karls SL, Snyder KR, Neibert PJ. Effectiveness of corticosteroid injections in the treatment of plantar fasciitis. J Sport Rehabil 2016; 25: 202-7.
35. Li H, Lv H, Lin T. Comparison of efficacy of eight treatments for plantar fasciitis: A network meta-analysis. J Cell Physiol 2018; 234: 860-70.
36. Ultrasound-Guided Injection of High Molecular Weight Hyaluronic Acid versus Corticosteroid in Management of Plantar Fasciitis: A 24-Week Randomized Clinical Trial. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6969680/. [Last accessed on 2023 Mar 26].