ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/325253599

The Clinical Outcomes are Associated with Changes in the Ultrasonography Structural Appearance After Platelet-Rich Plasma Treatment for Knee Osteoarthritis

Article *in* International Journal of Rheumatic Diseases · May 2018

CITATIONS
0

READS
12

7 authors, including:

Ibrahim Shady
Mansoura University
26 PUBLICATIONS **132** CITATIONS
SEE PROFILE

Amir Monir Ali
Mansoura University
18 PUBLICATIONS **0** CITATIONS
SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Anxiety-depressive symptoms in patients with chronic obstructive pulmonary disease (COPD) and impact on outcome View project

Condom Use Among Males (15-49 Years) In Lower Egypt, Knowledge, attitudes and Patterns of use View project

All content following this page was uploaded by Ibrahim Shady on 19 May 2018.

The user has requested enhancement of the downloaded file.

The Clinical Outcomes are Associated with Changes in the Ultrasonography Structural Appearance After Platelet-Rich Plasma Treatment for Knee Osteoarthritis

Hamada S Ahmad[1], Sherief E Farrag[1], Amr E Okasha[1], Aisha O Kadry[2], Tamer B Ata[3], Amir A Monir[4], Ibrahim Shady[5]

1. Rheumatology and Rehabilitation Department, Mansoura Faculty of Medicine, Mansoura University.
2. Assistant professor of Physical Medicine, Rheumatology, and Rehabilitation, Al Azhar Faculty of Medicine, Al Azhar University.
3. Lecturer of Medical Microbiology and Immunology, Mansoura Faculty of Medicine, Mansoura University.
4. Lecturer of diagnostic radiology, Mansoura Faculty of Medicine, Mansoura University.
5. Community Medicine Department, Mansoura Faculty of Medicine, Mansoura University.

dr_hamada1970@yahoo.com

Shereiffarrag@yahoo.com +966599380996

Amrsoliman007@yahoo.com +966503070681

Draaisha2009@hotmail.com +966557908326

Bedir_tamer@hotmail.com +966535412385

amirmonirali@gmail.com +966532564806

ebrshady@outlook.com +96550809023

Abstract

Background– Hyaluronic acid (HA) and platelet-rich plasma (PRP) are two treatment options used for knee osteoarthritis (KOA) but studies comparing the efficacy of the two yield conflicting results. In addition, the association of clinical outcomes of PRP intra-articular injections with changes in the ultrasonography structural appearance of the knee has not been investigated.

Aim of the study– To compare the efficacy of PRP and HA intra-articular injections as mono-therapeutic options for primary KOA, and to determine whether the clinical outcomes are associated with changes in the ultrasonography structural appearance.

Subjects and methods– A randomized clinical trial was conducted on 89 patients with KOA. The patients were given either PRP (n=45) or HA (n=44) intra-articular injections. The patients received three injections in the knee, which was more symptomatic at baseline evaluation, with a 2-week interval between injections. The outcome measures included VAS-pain, international knee documentation committee score, and assessment of synovial hypertrophy, synovial vascularity and knee effusion using ultrasonography. Outcome measures were assessed at baseline and at 3- and 6-months post-injection.

Results– While both PRP and HA injections resulted in the improvement of all outcome measures at 3- and 6-months follow up, they were significantly better in the PRP group than in the HA group.

Conclusion– Intra-articular injection of PRP is an effective treatment that reduced pain and improved the functional status in patients with KOA. The clinical outcomes of the intra-articular injections of PRP are associated with improved synovial hypertrophy and vascularity scores, and less effusion.

Introduction

Osteoarthritis (OA) is the most common form of arthritis, especially among the elderly, and is a leading cause of chronic disability worldwide, mostly as a consequence of knee OA (KOA) [1]. Millions of people affected by KOA suffer from chronic pain which affects their quality of life [2]. Among those older than 45 years, 16.7% have symptomatic KOA, 27.8% show radiographic evidence for KOA, and the remaining 87% have bilateral KOA [3]. Moreover, an increase in the prevalence of symptomatic KOA by 4.1% and 6% has been reported over the past 20 years among women and men, respectively [4]. The prevalence of KOA is expected to increase further due to an aging population and increased obesity.

Evidence from recent studies indicates that synovitis plays a critical role in the symptomatic and structural progression of OA [5–6]. It has been reported that synovitis strongly correlates with the severity of symptoms, cartilage degeneration rate, and osteophyte formation and determines, at least in part, the pattern of disease evolution and progression [7].

An intra-articular injection of Hyaluronic Acid (HA) is currently used for the treatment of KOA. When compared to non-steroidal anti-inflammatory drugs (NSAIDs), HA has been found to be more effective and safer [8–9]. There has been an increasing interest in recent years to use platelet-rich plasma (PRP) intra-articular injections for KOA treatment [10]. PRP offers a low cost and minimally invasive method of delivering highly concentrated autologous growth factors and bioactive molecules to the arthritic knees. Platelets are in fact used in the treatment of various diseases as they are a reservoir of growth factors which regulate the process of tissue healing and regeneration [11–13].

Several uncontrolled trials on patients with KOA indicate that intra-articular PRP injections result in better clinical outcomes at the end of the treatment in terms of pain reduction, tenderness, and functional capacity compared to the baseline values [14–20]. However, studies comparing the efficacy of HA and PRP on KOA have yielded conflicting results. Studies show PRP to be either more effective than [21–22] or equal to HA [23–24] in the treatment of KOA. In addition, to our knowledge, no study so far has investigated the clinical outcomes of PRP intra-articular injections with changes in the ultrasonography structural appearance of the knee.

The aim of this study was to compare the efficacy of PRP and HA intra-articular injection monotherapies in primary KOA treatment and to determine whether the clinical outcomes are associated with changes in the ultrasonography structural appearance.

Subjects and Methods

Study design

A single-blinded randomized controlled trial was conducted on parallel treatment groups.

Study population

One hundred consecutive patients with primary KOA were enrolled for the study from March 2016 to February 2017. To be eligible for inclusion, the patients had to meet the European League against Rheumatism 2010 criteria for the diagnosis of primary KOA [25] and had to have radiographic evidence of mild to moderate OA as per the Kellgren-Lawrence classification [26]. The exclusion criteria included age less than 40 years, coagulopathies, diabetes mellitus, intake of antithrombotic and antiplatelet drugs and NSAIDs, thrombocytopenia, and history of previous knee surgery or knee disorder other than the current primary OA. Before inclusion in the study, the procedure of the study was explained to the patients and all patients provided a written consent.

Baseline evaluation and outcome measures

The demographic characteristics of the patients and the baseline clinical and ultrasonography measurements were assessed. The clinical outcomes included VAS-pain, International Knee Documentation Committee (IKDC) subjective and objective scores [27], synovial hypertrophy and presence of effusion assessed using the grayscale ultrasound (US), and degree of synovial vascularity measured using the power Doppler US. Synovial hypertrophy was scored using a semi-quantitative system grade ranging from 0 (absent) to 3 (severe) [28], while the extent of synovial vascularity was graded from 1 (minimal perfusion) to 4 (marked perfusion) [29]. Patients were submitted at 3-months and 6-months post-intervention for evaluation of the outcome measures.

Randomization

Out of the 100 patients invited to participate in the current study, four patients did not provide a written consent and six patients were excluded according to the exclusion criteria, leaving only 90 eligible

participants. After the baseline evaluation, the patients were randomized 1:1 by means of block randomization and allocated into one of the two treatment groups. One patient in the HA intra-articular injection (HA-IAI) group died during follow up; therefore, data of only 89 patients (45 in the PRP intra-articular injection (PRP-IAI) group and 44 in HA-IAI group) were analyzed at the end of the study.

Intervention

The patients were instructed to discontinue any NASIDs from two weeks prior to starting treatment until the end of the study. Ultrasound-guided injections were given three times in the more symptomatic knee (as determined at baseline evaluation) to each patient, with an interval of two weeks between the injections.

PRP-IAI preparation-8 mL of peripheral blood was extracted and centrifuged for 9 min at 3500 rpm. The protocol that was used in this study did not include a second centrifugation step. Subsequently, 4 mL of PRP was obtained from each patient and was used for the intra-articular injection. PRP used in this study was not leucocytes-free. [30].

HA-IAI injection–2.0 mL (20 mg of HA) of high molecular weight HA was given to patients in the HA group. Post-injection, patients were instructed to apply icepack on the injected area for 30 min three times a day during the first two days, and switch to hot packs on the third and fourth days post-injection.

Statistical Analysis

All statistical analyses were performed using SPSS for windows version 20.0 (SPSS, Chicago, IL). Continuous data were expressed as mean ±standard deviation (SD), while categorical data were expressed in numbers and percentages. The differences between two groups or more were determined using independent samples Student's t-test for variables with continuous data or chi-square test for variables containing categorical data. Statistical significance was set at $p<0.05$.

Results

According to the inclusion and exclusion criteria, only 90 patients with KOA were eligible for inclusion in the study. The patients were randomized 1:1 into two treatment groups. One patient in the HA-IAI group died during follow up and therefore data of only 89 patients were analyzed (45 in the PRP-IAI group and 44 in HA-IAI group). Table 1 shows that the baseline characteristics, namely the age, sex, BMI, duration of KOA and the radiological grade, did not differ significantly between the two groups.

In addition, the clinical, as well as the ultrasonography outcome measures, were statistically not different between the two groups at baseline evaluation (Table 2).

At 3-month evaluation, both groups showed improvement in all the clinical and ultrasonography outcome measures compared to the baseline. However, VAS-pain, synovial vascularity, and the synovial hypertrophy were significantly lower while the ICKD score was significantly higher in the PRP-IAI group compared to the HA-IAI group. Furthermore, patients in the PRP-IAI group had less frequent effusions than patients in the HA-IAI group (Table 3). At 6-month evaluation, both groups showed further improvements in all the clinical and ultrasonography outcome measures when compared to values at both baseline and 3-months post-injection. However, the outcome measures at the 6-month follow up were significantly better in the PRP-IAI group than in the HA-IAI group (Table 4).

Discussion

The main findings of the current study were (a) PRP-IAI and HA-IAI both resulted in the improvement of all the clinical and ultrasonography outcome measures at 3- and 6-months post injection and (b) the outcome measures were significantly better in the PRP-IAI group compared to the HA-IAI group. In agreement with our findings, several other clinical trials have also shown that injections of PRP were better than HA injections in managing KOA.

Sanchez et al. [31] compared the efficacy of intra-articular injections of an autologous preparation of PRP with hyaluronan injections for KOA treatment. They found that PRP injections resulted in a significantly lower pain severity and better physical function subscale than in the hyaluronan group. Furthermore, ***Kon et al.*** [32] compared the efficacy of autologous PRP intra-articular injections with high molecular and low molecular weight HA injections in a randomized trial. The group receiving three autologous PRP injections fared better in terms of pain and symptom reduction compared to the HA injection groups. In addition, the PRP injections were also more effective in restoring joint function compared to HA injections.

Several subsequent studies confirmed the significantly better clinical outcomes of intra-articular injections of PRP compared to that of HA in terms of reducing pain [33–36], tenderness [37] and stiffness [36], and improving functional capacity [33–37] of the arthritic knee. Moreover, in elderly (>80 years) KOA patients, who are not eligible for autologous PRP treatment, homologous PRP has produced a significant short-term improvement in pain and ICKD score with an excellent safety profile [38].

Duymus et al. [39] compared the efficacy of three treatment lines, the intra-articular injection of PRP, HA and ozone gas, in patients with KOA and found that PRP was more effective than either HA or ozone injections in providing at least 12 pain-free months. On the other hand, ***Montañez-Heredia et al.*** [40] found that both PRP and HA treatments improved pain in KOA patients and that there were no significant differences between the groups in their immediate post-injection outcomes. However, PRP was more effective in reducing pain three months after the final injection compared to HA.

Two meta-analyses have investigated the long-term efficacy of the PRP versus HA intra-articular injections and concluded that PRP was associated with significantly better pain relief and functional outcome compared to the HA one year [21] and two years post-injection [22].

In our study, the degree of synovial vascularity, synovial hypertrophy, and the presence of effusion were evaluated for all patients at baseline and after 3- and 6-months post-injection by US examination score. Intra-articular injections of PRP resulted in significantly lower synovial hypertrophy and synovial vascularity scores, along-with less frequency of effusion compared to that of HA at 3- and 6- months post-injection. To our knowledge, this is the first study to investigate the effect of intra-articular injections of PRP on the ultrasonography parameters in patients with KOA.

Halpern et al. [41] investigated whether PRP therapy for early KOA was associated with good clinical outcomes and a change in MRI structural appearances, and observed that pain scores significantly decreased during the follow-up period, whereas radiological scores increased at 6- and 12-months from baseline. In our study, pain severity was decreased at the end of the study while the radiological scores were increased in all participants. However, at the end of the study, the US scores were significantly better in the PRP group than in the HA group, indicating that PRP injections slowed down the progression of the radiologic changes. Unfortunately, the study of ***Halpern et al.*** [41] did not include a control group to verify the effect of PRP injections on radiological progression of the lesions.

Conversely, two recent studies found that intra-articular injection of PRP did not have a better effect than HA in the management of knee degenerative disease and KOA. The patient cohort in the study of ***Feller et al.*** [23] was heterogeneous and included, in addition to KOA patients, those with other degenerative conditions including meniscal tears. In the study of ***Wang et al.*** [24], the protocol of injection was not explained by the authors. However, in both studies the intra-articular injections PRP and HA produced significant improvements in the pain and functional status scores compared to the baseline, but no significant differences were seen between the two treatment groups.

All these trials were very heterogeneous in terms of the administration interval for PRP intra-injections as well as the number of injections. Nevertheless, most studies reported better outcomes with PRP compared to other approaches such as HA injections.

Conclusion

Intra-articular injection of PRP is an effective treatment of KOA that reduced pain and improved the functional status of the patients. The clinical outcomes of the intra-articular injections of PRP included improved synovial hypertrophy and vascularity scores, and less frequency of effusion as per the ultrasonography examination.

Authors Contribution:

Dr. Hamada Ahmed: study Hypothesis starter, clinical management of patients, follow up of patients, analysis clinical results, interpreting the clinical result, writing and reviewing the review article.

Dr. Shereif Farrag: shared in study Hypothesis starter, clinical management of patients, follow up of patients, analysis clinical results, interpreting the clinical result, writing and reviewing the review article.

Dr. Amro Okasha: shared in study Hypothesis starter. Clinical management of patients, follow up of patients, analysis clinical results, interpreting the clinical result, writing and reviewing the review article.

Dr. Aisha Kadry: shared in study Hypothesis starter, clinical management of patients, follow up of patients, analysis clinical results, interpreting the clinical result, writing and reviewing the review article.

Dr. Tamer Ata: responsible for the microbiological aspects of the research, and help in analyzing, interpreting of clinical results in addition to writing and reviewing the review article.

Dr. Amir Monir: responsible for the radiological aspects of the research, and help in analyzing, interpreting of clinical results in addition to writing and reviewing the review article.

Dr. Ibrahim Shady: help in the design of the research methodology, collecting and statistically analyzing data as well as writing and reviewing.

Funding:

The Research Project was fully sponsored and funded only by the researchers in the matter of its steps and publication.

Conflict of interest:

The researchers acknowledge that there are no conflicts of interests at all.

References

1. **Grazio S, Balen D.** Obesity: Risk factor and predictors of osteoarthritis. *Lijec Vjesn*. 2009; 131:22–6.

2. **Heidari B.** Knee osteoarthritis prevalence, risk factors, pathogenesis and features: Part I. *Caspian J Intern Med*. 2011 Spring; 2 (2):205–12.

3. **Lawrence RC, Felson DT, Helmick CG, et al.** Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part II. *Arthritis Rheum*. 2008 Jan; 58 (1):26–35.

4. **Nguyen US, Zhang Y, Zhu Y, et al.** Increasing prevalence of knee pain and symptomatic knee osteoarthritis: survey and cohort data. *Ann Intern Med*. 2011 Dec 6; 155 (11):725–32.

5. **Sokolove J, Lepus CM.** Role of inflammation in the pathogenesis of osteoarthritis: latest findings and interpretations. *Ther Adv Musculoskelet Dis*. 2013 Apr; 5 (2):77–94.

6. **Hügle T, Geurts J.** What drives osteoarthritis?-synovial versus subchondral bone pathology. *Rheumatology (Oxford)*. 2016 Dec 21. pii: kew389. [Epub ahead of print].

7. **Scanzello CR, Goldring SR.** The role of synovitis in osteoarthritis pathogenesis. *Bone*. 2012 Aug; 51 (2):249–57.

8. **Bannuru RR, Natov NS, Dasi UR, et al.** Therapeutic trajectory following intra- articular hyaluronic acid injection in knee osteoarthritis--meta-analysis. *Osteoarthritis Cartilage*. 2011; 19 (6):611–9.

9. **Bannuru RR, Vaysbrot EE, Sullivan MC, et al.** Relative efficacy of hyaluronic acid in comparison with NSAIDs for knee osteoarthritis: a systematic review and meta-analysis. Semin. Arthritis Rheum. 2014; 43 (5):593–9.

10. **Cugat R, Cuscó X, Seijas R, et al.** Biologic enhancement of cartilage repair: the role of platelet-rich plasma and other commercially available growth factors. *Arthroscopy*. 2015 Apr; 31 (4):777–83.

11. **Hsu WK, Mishra A, Rodeo SR, et al.** Platelet-rich plasma in orthopaedic applications: evidence-based recommendations for treatment. *J Am Acad Orthop Surg*. 2013; 21:739–748.

12. **Smyth NA, Murawski CD, Fortier LA, et al.** Platelet-rich plasma in the pathologic processes of cartilage: review of basic science evidence. *Arthroscopy*. 2013; 29:1399–1409.

13. Xie X, Zhang C, Tuan RS. Biology of platelet-rich plasma and its clinical application in cartilage repair. *Arthritis Res Ther*. 2014; 16:204.

14. Kon E, Buda R, Filardo G, et al. Platelet-rich plasma: intra-articular knee injections produced favorable results on degenerative cartilage lesions. *Knee Surg Sports Traumatol Arthrosc*. 2010; 18:472–9.

15. Filardo G, Kon E, Buda R, et al. Platelet-rich plasma intra-articular knee injections for the treatment of degenerative cartilage lesions and osteoarthritis. *Knee Surg Sports Traumatol Arthrosc*. 2011; 19:528–35.

16. Wang-Saegusa A, Cugat R, Ares O, et al. Infiltration of plasma rich in growth factors for osteoarthritis of the knee short-term effects on function and quality of life. *Arch Orthop Trauma Surg*. 2011; 131:311–7.

17. Napolitano M, Matera S, Bossio M, et al. Autologous platelet gel for tissue regeneration in degenerative disorders of the knee. *Blood Transfus*. 2012 Jan;10 (1):72–7.

18. Filardo G, Kon E, Pereira Ruiz MT, et al. Platelet-rich plasma intra-articular injections for cartilage degeneration and osteoarthritis: single versus double-spinning approach. *Knee Surg Sports Traumatol Arthrosc*. 2012; 20:2078–87.

19. Simental-Mendía M, Vílchez-Cavazos JF, Peña-Martínez VM, et al. Leukocyte-poor platelet-rich plasma is more effective than the conventional therapy with acetaminophen for the treatment of early knee osteoarthritis. *Arch Orthop Trauma Surg*. 2016 Dec; 136 (12):1723–1732.

20. van Drumpt RA, van der Weegen W, King W, et al. Safety and Treatment Effectiveness of a Single Autologous Protein Solution Injection in Patients with Knee Osteoarthritis. *Biores Open Access*. 2016 Aug 1; 5 (1):261–8.

21. Dai WL, Zhou AG, Zhang H, et al. Efficacy of Platelet-Rich Plasma in the Treatment of Knee Osteoarthritis: A Meta-analysis of Randomized Controlled Trials. *Arthroscopy*. 2016 Dec 22. pii: S0749.

22. Sadabad HN, Behzadifar M, Arasteh F, et al. Efficacy of Platelet-Rich Plasma versus Hyaluronic Acid for treatment of Knee Osteoarthritis: A systematic review and meta-analysis. *Electron Physician*. 2016 Mar 25; 8 (3):2115–22.

23. Feller J. Platelet-Rich Plasma Injections Were Not Better Than Hyaluronic Acid Injections for Knee Joint Degeneration. *J Bone Joint Surg Am*. 2016 Feb 17; 98 (4):315.

24. Wang Z, Liu Y, Liu M. Platelet-rich plasma injection is not more effective than hyaluronic acid to treat knee osteoarthritis when using a random-effects model. *Br J Sports Med*. 2016 Aug; 50 (15):953–4.

25. Zhang W, Doherty M, Peat G, et al. EULAR evidence-based recommendations for the diagnosis of knee osteoarthritis. *Ann Rheum Dis*. 2010; 69:483–9.

26. Kellgren J, Lawrence J. Radiological assessment of osteoarthrosis. *Ann Rheum Dis*. 1957; 16:494–501.

27. Irrgang JJ, Anderson AF, Boland AL, et al. Development and validation of the international knee documentation committee subjective knee form. *Am J Sports Med*. 2001 Sep-Oct; 29 (5):600–13.

28. Iagnocco A, Meenagh G, Riente L, et al. Ultrasound imaging for the rheumatologist XXIX. Sonographic assessment of the knee in patients with osteoarthritis. *Clin Exp Rheumatol*. 2010; 28:643–646.

29. Newman JS, Laing TJ, McCarthy CJ, et al. Power Doppler sonography of synovitis: assessment of therapeutic response-preliminary observations. *Radiology*. 1996*;* 198*:* 582–4.

30. Mazzucco L, Balbo V, Cattana E, et al. Not every PRP-gel is born equal. Evaluation of growth factor availability for tissues through four PRP-gel preparations: Fibrinet, RegenPRP-Kit, Plateltex and one manual procedure. *Vox Sang*. 2009 Aug; 97 (2):110–8.

31. Sanchez M, Anitua E, Azofra J, et al. Intra-articular injection of an autologous preparation rich in growth factors for the treatment of knee OA: a retrospective cohort study. *Clin Exp Rheumatol*. 2008; 26:910–3.

32. Kon E, Mandelbaum B, Buda R, et al. Platelet-rich plasma intra-articular injection versus hyaluronic acid viscosupplementation as treatments for cartilage pathology: from early degeneration to osteoarthritis. *Arthroscopy*. 2011; 27:1490–501.

33. Sampson S, Reed M, Silvers H, et al. Injection of platelet-rich plasma in patients with primary and secondary knee osteoarthritis: a pilot study. *Am J Phys Med Rehabil*. 2010 Dec; 89 (12):961–9.

34. Cerza F, Carni S, Carcangiu A, et al. Comparison between hyaluronic acid and platelet rich plasma, intra-articular infiltration in the treatment of gonarthrosis. *Am J Sports Med*. 2012; 40:2822–7.

35. Spaková T, Rosocha J, Lacko M, et al. Treatment of knee joint osteoarthritis with autologous plateletrich plasma in comparison with hyaluronic acid. *Am J Phys Med Rehabil*. 2012; 91:411–7.

36. Vaquerizo V, Plasencia MA, Arribas I, et al. Comparison of intra-articular injections of plasma rich in growth factors (PRGF-Endoret) versus Durolane hyaluronic acid in the treatment of patients with symptomatic osteoarthritis: a randomized controlled trial. *Arthroscopy*. 2013; 29:1635–43.

37. Sánchez M, Fiz N, Azofra J, et al. A randomized clinical trial evaluating plasma rich in growth factors (PRGF-Endoret) versus hyaluronic acid in the short-term treatment of symptomatic knee osteoarthritis. *Arthroscopy*. 2012; 28:1070–8.

38. Bottegoni C, Dei Giudici L, Salvemini S, et al. Homologous platelet-rich plasma for the treatment of knee osteoarthritis in selected elderly patients: an open-label, uncontrolled, pilot study. *Ther Adv Musculoskelet Dis*. 2016 Apr; 8 (2):35–41.

39. Duymus TM, Mutlu S, Dernek B, et al. Choice of intra-articular injection in treatment of knee osteoarthritis: platelet-rich plasma, hyaluronic acid or ozone options. *Knee Surg Sports Traumatol Arthrosc*. 2016 Apr 7.

40. Montañez-Heredia E, Irízar S, Huertas PJ, et al. Intra-Articular Injections of Platelet-Rich Plasma versus Hyaluronic Acid in the Treatment of Osteoarthritic Knee Pain: A Randomized Clinical Trial in the Context of the Spanish National Health Care System. *Int J Mol Sci*. 2016 Jul 2; 17 (7).

41. Halpern B, Chaudhury S, Rodeo SA, et al. Clinical and MRI outcomes after platelet-rich plasma treatment for knee osteoarthritis. *Clin J Sport Med*. 2013 May; 23 (3):238–9.

Table 1. Comparison of the sociodemographic data, BMI, duration of KOA and Kellgren-Lawrence grade between the PRP-IAI group and HA-IAI group at baseline

	PRP-IAI group	HA-IAI group	p
Age (years)	56.2 ±6.8	56.8 ±7.4	0.691
Females (n, %)	31, 68.9%	30, 68.2%	0.336
BMI (kg/m^2)	26.7 ±3.6	26.5 ±3.5	0.791
Duration of KOA (years)	9.7 ±3.9	10.1 ±4.2	0.643
Kellgren-Lawrence grade			
Grade I	8, 17.8%	7, 15.9%	
Grade II	17, 37.8%	19, 43.2%	
Grade III	20, 44.4%	18, 40.9%	0.873

Table 2. Comparison of the outcome measures between the PRP-IAI group and HA-IAI group at baseline

	PRP-IAI group	HA-IAI group	p
Clinical parameters			
VAS-pain	5.8 ±1.9	6.1 ±1.7	0.435
IKCD score	49.2 ±14.9	47.2 ±16.2	0.546
US findings			
Synovial vascularity	1.99 ±0.95	2.05 ±0.85	0.755
Synovial hypertrophy	2.13 ±0.89	2.16 ±0.94	0.876
Effusion (n, %)	23 (51.1%)	21 (47.7%)	0.749

Table 3. Comparison of the outcome measures between the PRP-IAI group and HA-IAI group after 3 months

	PRP-IAI group	HA-IAI group	p
Clinical parameters			
VAS-pain	4.6 ±1.6	5.3 ±1.6	0.042
IKCD score	67.9 ±13.7	59.6 ±15.4	0.009
US findings			
Synovial vascularity	1.59 ±0.86	1.98 ±0.81	0.031
Synovial hypertrophy	1.60 ±0.81	1.95 ±0.83	0.047
Effusion (n, %)	9 (20%)	18 (40.9%)	0.032

Table 4. Comparison of the outcome measures between the PRP-IAI group and HA-IAI group after 6 months

	PRP-IAI group	HA-IAI group	p
Clinical parameters			
VAS-pain	4.14 ±1.44	5.95 ±1.52	0.012
IKCD score	75.7 ±15.1	65.6 ±16.9	0.004
US findings			
Synovial vascularity	1.46 ±0.79	1.86 ±0.76	0.017
Synovial hypertrophy	1.49 ±0.75	1.84 ±0.79	0.035
Effusion (n, %)	6 (13.3%)	15 (34.1%)	0.021

View publication stats