

Hi-clinical outcome of Platelet-rich plasma injections in early knee Osteoarthritis

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Abstract:

The aim of this study was to evaluate the clinical outcome of Platelet-rich plasma (PRP) injections in grade I and II knee osteoarthritis.

Material and Methods: Data of patients with early knee osteo-arthritis was collected retrospectively; three intra-articular injections were given each one month apart. Patients were assessed clinically before the treatment and after treatment at 3, 6 and 9 months follow up with VAS and WOMAC score. Significant improvement was found after treatment.

Conclusion: PRP intra-articular injections in grade I and II knee osteoarthritis showed effective short term clinical outcome in respect to alleviating pain, stiffness and improving function.

Keywords: Platelet rich Plasma (PRP), Intra-articular treatment, Knee osteoarthritis

Introduction:

Osteoarthritis is progressive degenerative joint disease. Various biomechanical and biochemical factors are implicated in the damage of cartilage of the knee joint, such as advancing age, malalignment, instability, trauma.¹ The primary osteoarthritis of the knee joint in early stages causes pain, stiffness and function allimitation.

The treatment in early osteoarthritis is basically conservative such as pain management, physiotherapy, and supplements. Now-a-days platelet rich plasma PRP introduced as treatment option for early osteoarthritis of knee joint, basically PRP causes of repair of the damage cartilage thus giving pain relief and improvement in function.^{1,2}

The goal of this study was to evaluate the clinical outcome of PRP injections in early knee osteoarthritis.

Material and Methods:

A retrospective study from February 2019 to March 2020 including 88 knees of 58 patients who presented with the complain of unilateral

or bilateral knee pain, knee joint stiffness and limitation in routine activities of daily living were evaluated clinically and radiographically, all the radiographs reviewed by single reader and patients were classified as early osteoarthritis (OA) of knee joint according to the Kellgren Lawrence criteria.³ Patients with moderate and advance knee osteoarthritis and other diseases such as rheumatoid arthritis (RA), gout, ankylosing spondylitis (AS), infectious joint disease, radiculopathy from spinal disease, acute knee joint injury were excluded.

All procedures were performed in out-patient department, after aseptic measures, 3ml of platelet rich plasma injected anteriorly laterally in 5cc syringe. Three intra-articular knee injections of platelet rich plasma (PRP) were injected each one month apart. After procedure patients were sent home with post-procedure care as: NSAIDs for pain relief for two weeks, routine activities of daily living, quadriceps and hamstrings strengthening exercises. All other modalities for treatment of early knee OA were advised to hold.

All patients were followed upon 3, 6 and 9 months and the clinical outcome was measure

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Table 1: Demonstrates demographic characteristics of patients

	N (%)
Gender	
Female	36(62.1%)
Male	22(37.9%)
Age	51.76(±SD6.992)
Stage	
Stage 1	18(31%)
Stage 2	40(69%)
Knee involved	
Unilateral	28(48.3%)
Bilateral	30(51.7%)

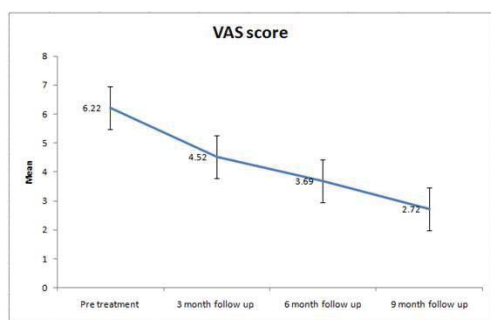


Figure 1. Pre treatment, 3rd, 6th and 9th month followup VAS score

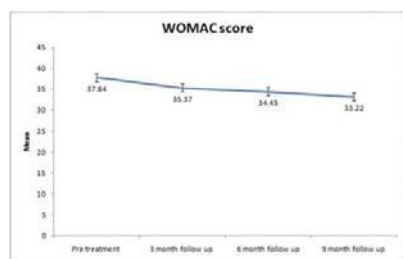


Figure 2. Pre treatment, 3rd, 6th and 9th month follow up WOMAC score

Table 2: Demonstrates pre-treatment, 3rd, 6th and 9th follow-up VAS and WOMAC score

	Mean+SD	Pvalue
VAS score		
Pre-treatment	6.22(±0.859)	
3 months follow up	4.52(±0.995)	<0.01*
6 months follow up	3.69(±1.231)	<0.01*
9 months follow up	2.72(±1.295)	<0.01*
WOMAC Score		
Pre-treatment	37.84(±10.10)	
3 months follow up	35.37(±9.258)	<0.01*
6 months follow up	34.45(±8.261)	<0.01*
9 months follow up	33.22(±8.160)	<0.01*

Pre-treatment outcomes compared with 3rd, 6th and 9th month follow-up

*p<0.05 was considered significant using Paired sample t-test

by visual analog score (VAS) and Western Ontario and McMaster Universities Arthritis Index (WOMAC) score for pain, stiffness, and range of motion.^{4,5,9} Significant improvement was recorded on 3, 6 and 9 months follow up visits and after 9 months follow-up.

Results:

In the present study there were 58 patients females (62.1%) and males (37.9%) with mean age of 51.76 (±6.9) years (range:35–67 years) were enrolled. Pre-operative plain radiographs (31%) showed grade I primary knee osteoarthritis and (69%) showed grade II primary knee osteoarthritis. Demographic characteristics of patients demonstrated in Table 1.

All patients were evaluated pre-procedure with mean VAS score of 6.22±SD 0.859. At 3 months follow-up mean VAS score 4.52±SD 0.995, at 6 months follow-up mean VAS score 3.69±SD 1.231 and 9 months follow-up mean VAS score 2.72±SD 1.295. Fig 1 Mean WOMAC score pre-treatment was 37.84 which improved to 35.37, 34.04 and 33.22 at 3, 6 and 9 month follow-up respectively. Fig 2 Table 2 Demonstrates pre-treatment 3, 6 and 9 month follow-up VAS and WOMAC scores.

VAS and WOMAC scores were significantly decreased from baseline to follow-up at 3rd, 6th and 9th month with P<0.01.

We did not observe any adverse reactions or possible complication such as infection after intra-articular platelet rich plasma PRP injection.

Discussion:

Knee Osteoarthritis is a common joint disease that affects millions of people world-wide, it results due to degenerative process that gradually breaks down of the cartilage that covers the end of the femur and tibia and the inner surface of patella that leads knee pain, stiffness, deformity, difficulty in walking, squatting and sitting cross leg. In primary knee OA exact cause is unknown, but various risk factors such as aging, obesity, genetics, and malnutrition may precipitate the degenerative process, whereas secondary knee OA may be caused by various entities such as

trauma, infection. In aging the joint cartilage wears away and the joint ability to absorb shock and stresses decreases thus leads to knee OA.

Knee OA presents clinically with knee pain symptoms ranging from playing or sitting for long periods of time or difficulty in walking, climbing stairs, difficulty in squatting or stiffness and deformity.

There are many treatment options for knee OA, depends upon the severity of the disease and individual functional demands.

The most important part of the treatment of the knee OA is weight reduction because being overweight put more stress on the joint that in turn exacerbate the degenerative process.

Physiotherapy also helps in symptoms reduction and improves range of motion and increase stability.

Various medicines have been used in the treatment of early knee osteoarthritis (OA), such as NSAIDs, Glucosamine, Chondroitin-sulfate, intra-articular hyaluronic acid, intra-articular injection of steroids, in patients with early knee osteoarthritis.

Platelet rich plasma (PRP) intra articular injections evolved as effective treatment option for early knee osteoarthritis and showed effective-short term clinical results.⁷ Platelet rich plasma (PRP) is an autologous blood product that consists of high concentration of platelets, that contains growth factors and cytokines which helps in the down regulation of the inflammatory process and cartilage regeneration.^{4,6}

The short term clinical outcome of this study indicates that intra-articular injections of platelet-rich plasma (PRP) is viable treatment option for early knee osteoarthritis (OA) that reduces symptoms such as pain, stiffness and improve function at short-term follow-up.^{6,8}

Limitation of this study is a relatively small sample size, short follow-up of 9 months; were commend studies with large sample size, long

follow-up in order to determine the progression of knee osteoarthritis and long term functional outcome.

Conclusion:

PRP intra articular injections in early knee osteoarthritis showed effective short term clinical outcome in respect to alleviating pain, stiffness and improving function.

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Role and contribution of authors:

Eid Muhammad, collected the data, references and did the initial write-up.

Karim Bakhsh, collected the data, references and helped in discussion writing.

Muhammad Saleem, typically review the article and made the final changes.

M Zam Zam, collected the data, references and helped in introduction and discussion writing,

References:

1. Kilincoglu V, Yeter A, Servet E, Kangal M, Yildirim M. Short term results comparison of intra-articular platelet-rich plasma (PRP) and hyaluronic acid (HA) applications in early stage of knee osteoarthritis. *International Journal of Clinical and Experimental Medicine*. 2015;8(10):18807.
2. Jang SJ, Kim JD, Cha SS. Platelet-rich plasma (PRP) injection sasan effective treatment for early osteoarthritis. *European Journal of Orthopaedic Surgery & Traumatology*. 2013 Jul1;23(5):573-80.
3. Kellgren JH, Lawrence JS. Radiological assessment of osteoarthritis. *Annals of the rheumatic diseases*. 1957Dec;16(4):494.
4. Huang PH, Wang CJ, Chou WY, Wang JW, Ko JY. Short-term clinical results of intra-articular PRP injections for early osteoarthritis of the knee. *International Journal of Surgery*. 2017 Jun 1;42:117-22.
5. McConnell S, Kolopack P, Davis AM. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC): a review of its utility and measurement properties. *Arthritis Care & Research: Official Journal of the American College of Rheumatology*. 2001 Oct;45(5):453-61.
6. Martini LL, Via AG, Fossati C, Randelli F, Randelli P, Cucchi D. Single platelet-rich plasma injection for early stage of osteoarthritis of the knee. *Joints*. 2017Mar;5(1):2.
7. Dhillon MS, Patel S, John R. PRP in OA knee—update, current confusions and future options. *Sicot-j*. 2017;3.
8. Hassan AS, El-Shafey AM, Ahmed HS, Hamed MS. Effectiveness of the intra-articular injection of platelet rich plasma in the treatment of patients with primary knee osteoarthritis. *The Egyptian Rheumatologist*. 2015 Jul1;37(3):119-24.
9. Hassan AS, El-Shafey AM, Ahmed HS, Hamed MS. Effectiveness of the intra-articular injection of platelet rich plasma in the treatment of patients with primary knee osteoarthritis. *The Egyptian Rheumatologist*. 2015 Jul1;37(3):119-24.
10. Waterfield J, Sim J. Clinical assessment of pain by the visual analogue scale. *British Journal of Therapy and Rehabilitation*. 1996Feb;3(2):94-7.