

 ISSN NO. 2320-5407	Journal Homepage: www.journalijar.com INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR) Article DOI: 10.21474/IJAR01/12890 DOI URL: http://dx.doi.org/10.21474/IJAR01/12890	 INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR) ISSN 2320-5407 Journal Homepage: http://www.journalijar.com Article DOI: 10.21474/IJAR01/12890
---	---	--

RESEARCH ARTICLE

FUNCTIONAL OUTCOME OF PLATELET-RICH PLASMA INJECTIONS GIVEN IN OSTEOARTHRITIS KNEE IN TERTIARY CARE CENTER

Dr. Gagandeep Singh Raina¹, Dr. Gagandeep Singh¹ and Dr. Sanjeev Gupta²

1. Post-Graduate Resident Department of Orthopaedics, Government Medical College, Jammu.
2. Professor and Head, Department of Orthopaedics, Government Medical College, Jammu.

Manuscript Info

Manuscript History

Received: 20 March 2021
Final Accepted: 24 April 2021
Published: May 2021

Key words:-

PRP Injection , Knee Pain , OA Knee

Abstract

Introduction: Osteoarthritis(OA) knee cases are increasing day by day and with no established cure of disease only palliative (analgesics) therapy is given. Platelet-rich plasma (PRP) injection aim at reducing the pain as well as causing regeneration of articular cartilage partially reversing the disease process.

Methods: 49 patients with OA were given PRP injection and followed up for a period of 48 weeks . Western Ontario and McMaster Universities Osteoarthritis Index(WOMAC) was used to evaluate the results of the study.

Results: Patients showed marked improvement in symptoms after the PRP injection but patients having higher body mass index(BMI) had relatively poorer response to therapy.

Conclusion: Our study concluded that PRP injection is an effective modality in the treatment of OA knee whose long term effects are yet to be determined.

Copy Right, IJAR, 2021,. All rights reserved.

Introduction:-

Osteoarthritis (OA) is a chronic musculoskeletal condition that commonly affects the knee and/or hip joints. It is a major public health problem worldwide and is projected to rapidly increase as the population ages and rates of obesity escalate.^{1,2} OA changes the normal physiology of joint and increases the catabolic processes that alters the anatomy of joint cartilage eventually leading to its destruction.³ Inflammatory changes and vascular pathology, along with meniscal changes, bone remodelling and subchondral sclerosis, produces a vicious cycle of progressive joint degeneration.⁴ Till date, OA is incurable and most of the research done on this topic focusses on various methods to reduce the pain and improve functional capacity of patient. On going non-drug and drug therapies (such as exercise, life style modifications, weight reduction, analgesics and anti-inflammatory agents) can only delay the onset or have short-term clinical benefits.⁵ Currently no disease-modifying agent has been approved by regulatory agencies. However, therapies that affect the underlying biological processes responsible for OA pathogenesis have potential. One such biologic therapy receiving increasing interest is platelet-rich plasma (PRP) injections into the affected joint. There are several possible advantages of PRP as a treatment for OA. First, it is relatively easy to use because its preparation is rapid and technically straightforward, and the administration is minimally-invasive requiring a simple intra-articular injection which can be performed in the office. Second, it is likely to be safe because the patient's own proteins are used and bioactive molecules can be appropriately concentrated, thereby avoiding many adverse effects and drug interactions.⁶

Corresponding Author:- Dr. Gagandeep Singh

Address:- Post-Graduate Resident Department of Orthopaedics, Government Medical College, Jammu.

Material And Methods:-

All patients having OA who fell under the criteria and gave consent for the procedure were managed with PRP injection in knee joint at the Department of Orthopaedics, Government Medical College, Jammu from August, 2019 to February, 2020 were included in the present study and later were followed for at least 48 weeks. The study was a prospective observational type of study.

The following categories of patients were included in the study:

1. age 20 to 80 years
2. Chronic(at least 6 months) pain or swelling of knee
3. Radiological finding of degenerative changes in knee joint
4. Kellgren lawrence grade 1,2 and 3

The following categories of patients were excluded from the study:

1. age <20 years or >80 years
2. steroid injection within 6 weeks
3. Kellgren lawrence grade 4
4. infections of the knee joint within 6 months
5. Malignancy
6. Rheumatoid arthritis

Aim of the study was to review the current knowledge on the beneficial effects and durable results of PRP intraarticular injections in knee OA.

A total of 58 patients were included in the study based on the inclusion and exclusion criteria. Nine patients were lost to follow-up and hence excluded from the study. Hence, finally only 49 patients were enrolled for the present study (n=49). An informed written consent was obtained from all the study participants after explaining the nature of the study in their local language. All the involved patients were subjected to radiographic evaluation. Strict anteroposterior(weight bearing) and lateral view radiographs of the knee were taken. Their BMI was calculated. All type of pain medications were stopped 1 week prior to the procedure.

Procedure:-

All patients were given 2 doses of injection 4 weeks apart and were followed up for 11 months(48 weeks). 50-60 ml of venous blood was collected from each patient with 18-gauge syringes and 5 ml of acid citrate dextrose solution was added to the sample as an anticoagulant. Then the sample was subjected to centrifugation. After double centrifugation, 5-6 ml of PRP is received. The PRP was injected into the affected knee via superolateral approach. After the injection was completed, patient was asked to gently flex and extend knee multiple times for uniform distribution of PRP. Patients were given acetaminophen for pain and instructed to limit the use of the affected knee for 24 h after injection, after which normal activities could resume. The outcome was measured using the Western Ontario and McMaster Universities Osteoarthritis Index(WOMAC), were determined at a preinjection visit and at 4, 8, 12, 24, 36 and 48 weeks.

The patients were compared on the basis of age, gender, BMI and functional outcome after calculating their percentage, range and average values.

Results:-

The study included 49 participants out of which 30(60%) were male and 19(40%) were female. The most common age group involved is 60-70 years(36%). The age and sex distribution are depicted in table 1 and table 2 respectively.

Table 1:- Age distribution.

Age group	Patients	Percentage
20-30	0	0
30-40	4	8
40-50	6	12
50-60	16	32
60-70	18	36

70-80	5	12
-------	---	----

Table 2:- Sex distribution.

Gender	Patients	Percentage
Male	30	60
Female	19	40

In the present study , 26 patients were diabetic , 22 were hypertensive and 4 were hypothyroid .12 patients were suffering from both diabetes and hypertension. BMI of majority of patients was above 30 (56%) as shown in table 3.

Table 3:- Distribution based on BMI.

BMI	Patients	Percentage	Category
18.5-24.9	4	8	NORMAL
25.0-29.9	17	35	OVERWEIGHT
30.0-34.9	23	47	OBESE
>35.0	5	10	EXTREMELY OBESE

Patients were followed for 48 weeks at regular intervals.

The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) was used for clinical evaluation. A statistically significant improvement in all clinical scores was obtained from the basal evaluation to the end of treatment. These improvements were maintained at 6 months but the score comparatively reduced at 11th month, but 80% of patients were satisfied.

Table 4:- Womac comparison in different follow up.

WOMAC score	No. of Patients (Pre procedure)	4 wk f/up	8wk f/up	12wk f/up	36wk f/up	48wk f/up
1-19	0	0	0	0	0	0
20-38	9	7	3	0	0	0
39-57	38	32	16	4	4	10
58-76	2	10	16	25	19	21
77-96	0	0	14	20	26	18

Discussion:-

OA Knee is becoming a major health problem due to increasing geriatric population and increasing obesity due to modern lifestyle. PRP injection is simple yet effective modality of treatment which causes pain relief and improves the quality of life of patient. In present study , majority of patients who developed OA had BMI of more than 30 (56%) and most common age group was between 60-70 years .This is in line with the fact that degenerative changes are directly related to the age of the patient.^{7,8} The study also shows that higher BMI predisposes to more degenerative changes.⁷ The results were not as good for the patients with BMI higher than 35. In our study, we used WOMAC score to compare the results and majority patients were satisfied with PRP injections .Most patients started experiencing significant pain relief after 4 weeks which went on improving till 36 weeks. After 36 weeks ,pain started reappearing or started increasing in few patients which indicates loss of effect of PRP. Maximum pain relief was experienced between 5-7 month post injection. This is similar to the studies done by Chang(2014) which stated that PRP led to significant functional improvement in patients with knee OA, whose effects last at least 12 months.⁹ Other studies also indicated an improvement in activities of daily life with PRP but on average, patients felt relapsed knee pain 8.8 months after the procedure.⁽¹⁰⁾

The lack of a control group and rehabilitation programme and a short follow up were limiting factors.

Conclusion:-

With no definitive cure for OA knee , PRP injections have potential of becoming the mainstay of management in future . In our study we found that the patients improved clinically after the injection and were pain free and more

comfortable in performing daily activities for certain period of time. Careful patient selection also improves the effect and duration of therapy

Funding :

No funding source

Conflict of Interest :

None declared

Ethical approval : The study was approved by the Institutional Ethics Committee.

References:-

1. Pereira D, Peleteiro B, Araujo J, Branco J, Santos RA, Ramos E. The effect of osteoarthritis definition on prevalence and incidence estimates: a systematic review. *Osteoarth Cart.* 2011;19:1270-85.
2. Cross M, Smith E, Hoy D, Nolte S, Ackerman I, Fransen M, et al. The global burden of hip and knee osteoarthritis: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis.* 2014;73:1323-30.
3. Dhillon MS, Patel S, John R (2017) PRP in OA knee – update, current confusions and future options. *Sicot-J* 3:27
4. Wruck CJ, Fragoulis A, Gurzynski A, Brandenburg LO, Kan YW, Chan K, Hassenpflug J, Freitag-Wolf S, Varoga D, Lippross S, Pufe T (2011) Role of oxidative stress in rheumatoid arthritis: insights from the Nrf2-knockout mice. *Ann Rheum Dis* 70:844–850
5. Zhang W, Nuki G, Moskowitz RW, Abramson S, Altman RD, Arden NK, et al. OARSI recommendations for the management of hip and knee osteoarthritis: Part III: Changes in evidence following systematic cumulative update of research published through January 2009. *Osteoarth Cart.* 2010;18:476-99.
6. Zhu Y, Yuan M, Meng HY, Wang AY, Guo QY, Wang Y, et al. Basic science and clinical application of platelet-rich plasma for cartilage defects and osteoarthritis: A review. *Osteoarth Cart.* 2013;21:1627-37.
7. Muraki S, Tanaka S, Yoshimura N. Epidemiology of knee osteoarthritis. *OA SportsMedicine* 2013 Nov 26;1(3):21.
8. Corti MC, Rigon C. Epidemiology of osteoarthritis: prevalence, risk factors and functional impact. *Aging Clin Exp Res.* 2003 Oct;15(5):359-63.
9. Chang K. Comparative effectiveness of platelet-rich plasma injections for treating knee joint cartilage degenerative pathology: a systematic review and metaanalysis. *Arch Phys Med Rehabil.* 2014;95:562–75
10. Jang SJ, Kim JD, Cha SS. Platelet-rich plasma (PRP) injections as an effective treatment for early osteoarthritis. *Eur J Orthop Surg Traumatol.* 2013 Jul;23(5):573-80.