Original research article

A study on clinical profile of patients with primary osteoarthritis of knee

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 Abstract
Osteoarthritis (OA) is the most common form of arthritis and one of the leading causes of disability. This degenerative and progressive joint disease affects around 250 million people worldwide and more than 27 million people in the United States. Elderly (approximately 35% of patients over 65 years old) females, patients with obesity and African Americans are the population with the highest risk of developing OA. The study was hospital based prospective randomized controlled trail. The patients were subjected to a standardized injection protocol and are assessed on variables such as pain, stiffness and physical function using WOMAC scale, & for pain, using visual analog scale at pre injection,6 wks post injection, 3 months & 6 months post injection. 19 (23.75%) patients (9 in PRP group & 10 in steroid group) were between 41-50 years, 23 (28.75%) patients (15in PRP group & 8 in steroid group) were between 51-60 years, 38(47.5%) patients (16 in PRP in group & 22 in steroid group) were more than 60 years.
Keywords: Primary osteoarthritis, knee, clinical profile

Introduction
Knee osteoarthritis (OA) is a disease caused by biomechanical stresses affecting the articular cartilage and subchondral bone of the knee. This disease will cause pain and functional impotence. OA may involve either medial tibiofemoral compartment, lateral tibiofemoral compartment or patellofemoral compartment according to the localization of cartilage deterioration. It is necessary to keep in mind that the diagnosis of knee OA is made at first at clinical examination. Pain, morning stiffness and swelling of the knee in a patient older than 50 must be considered as consequences of OA [1].
Osteoarthritis (OA) is the most common form of arthritis and one of the leading causes of disability. This degenerative and progressive joint disease affects around 250 million people worldwide and more than 27 million people in the United States. Elderly (approximately 35% of patients over 65 years old) females, patients with obesity and African Americans are the population with the highest risk of developing OA. Given the trend of the population to live longer and the progressive increment of obesity in our country, the number of affected patients most likely will substantially increase within the upcoming years. This is concerning given the functional impairment and disability associated with this condition and its negative toll on the social and economic aspects of our society [2].
The knee is the largest synovial joint in humans, it is composed by osseous structures (distal femur, proximal tibia, and patella), cartilage (meniscus and hyaline cartilage), ligaments and a synovial membrane. The latter is in charge of the production of the synovial fluid, which provides lubrication and nutrients to the avascular cartilage. Unfortunately, given the high use and stress of this joint, it is a frequent site for painful conditions including OA [3].
OA is classified into two groups according to its etiology: primary (idiopathic or non-traumatic) and secondary (usually due to trauma or mechanical misalignment). The severity of the disease can also be graded according to the radiographical findings by the Kellgren - Lawrence (KL) system described in 1957. It was believed that OA was exclusively a degenerative disease of the cartilage, however, latest evidence has proven that OA is a multifactorial entity, involving multiple causative factors like trauma, mechanical forces, inflammation, biochemical reactions, and metabolic derangements. It is also known

that the cartilaginous tissue is not the only one involved. Given its lack of vasculature and innervation, the cartilage, by itself is not capable of producing inflammation or pain at least on early stages of the disease. Hence, the source of pain is mainly derived from changes to the non-cartilaginous components of the joint, like the joint capsule, synovium, subchondral bone, ligaments, and peri-articular muscles. As the disease advances, these structures are affected and changes including bone remodeling, osteophyte formation, weakening of periarticular muscles, laxity of ligaments, and synovial effusion can become evident.

Methodology
The study was a hospital based prospective randomized controlled trail. The patients were subjected to a standardized injection protocol and were assessed on variables such as pain, stiffness and physical function using WOMAC scale, & for pain, using visual analog scale at pre injection, 6 wks post injection, 3 months & 6 months post injection.

Source of data
The data was collected by interviewing the 80 patients came with knee pain to orthopaedic department.

Inclusion criteria
Patients of either sex with symptoms typical to primary osteoarthritis with clinically diagnosed as suffering from osteoarthritis knee

Exclusion criteria
1. Immunosupressed patients.
2. Patients with secondary osteoarthritis.
3. Patients with connective tissue disorders.
4. Patients who have received steroid injection within past 6 months.
5. Patients with haemoglobin less than 10 mg%.
6. Patients with tumours, metabolic disease of bone with coexisting backache.
7. Patients who have already undergone surgical interventions.
8. Any local skin pathology at injection site.

Study design
The study was hospital based prospective randomized controlled trail. The patients were subjected to a standardized injection protocol and are assessed on variables such as pain, stiffness and physical function using WOMAC scale, & for pain, using visual analog scale at pre injection, 6 wks post injection, 3 months & 6 months post injection.

Statistical analysis
The results were evaluated and compared using Chi Square Test.

Data collection
After obtaining the informed, written consent from the patients, the patient was enrolled into the study after considering the inclusion and exclusion criteria. Demographic data, history, clinical examination, and details of investigation was recorded in the study proforma.
Patients were subjected to specific investigations to rule out other conditions presenting with similar clinical features.

The patients were divided into two groups based on the treatment
1. First group received local platelet rich plasma injection.
2. Second group received local steroid injection.

Results
19 (23.75%) patients (9 in PRP group & 10 in steroid group) were between 41-50 years, 23 (28.75%) patients (15in PRP group & 8 in steroid group) were between 51-60 years, 38(47.5%) patients (16 in PRP in group & 22 in steroid group) were more than 60 years.
Mean age in PRP group was 58.32 years & in steroid group 60.67 years.

Table 1: Age distribution

Age distribution	Platelet Rich Plasma	%	Intra-Article Steroid	%
≤40 years	0	0	0	0
41-50 years	9	22.5	10	25
51-60 years	15	37.5	8	20
>60 years	16	40	22	55
Total	40	100	40	100

Age distribution	Platelet Rich Plasma	Intra-Article Steroid
N	40	40
Mean	58.325	60.675
SD	8.19	10.17
P value (unpaired t-test)	0.2585,NS	

35 (43.75%) patients (16 in PRP group & 19 in steroid group) were Male, 45 (56.25%) patients (24 in PRP group & 21 in steroid group) were Female patients.

Table 2: Gender distribution

Gender distribution	Platelet Rich Plasma	%	Intra-Article Steroid	%
Male	16	40	19	47.5
Female	24	60	21	52.5
Total	40	100	40	100
p-value (Chisquare test)	0.6525,NS			

14(17.5%) patients (10 in PRP group & 4 in Steroid group) were less than 150 cms heigh, 34 (42.5%) patients (15 in PRP group & 19 in Steroid group) were between 151 to 160 cms height, 26 (32.5%) patients (10 in PRP group & 16 in Steroid group) were between 161 to 170 cms height, 6 (7.5%) patients (5 in PRP group & 1 in Steroid group) were between 171 to 180 cms.

Table 3: Height distribution

Height distribution	Platelet Rich Plasma	%	Intra-Article Steroid	%
≤150cm	10	25	4	10
151-160 cm	15	37.5	19	47.5
161-170 cm	10	25	16	40
171-180 cm	5	12.5	1	2.5
Total	40	100	40	100

Height distribution	Platelet Rich Plasma	Intra-Article Steroid
N	40	40
Mean	157.83	159.5
SD	9.71	6.16
P value (unpaired t-test)	0.3596,NS	

21 (26.25%) patients (14 in PRP group & 7 in steroid group) were less than 60 kgs weight, 38 (47.5%) patients (17 in PRP group & 21 in steroid group) were between 61-70 kgs, 20 (25%) patients (9 in PRP group & 11 in steroid group) were between 71-80 kgs. & 1 (1.25%) patient (in steroid group) was between 81-90 kgs.

Table 4: Weight distribution

Weight distribution	Platelet Rich Plasma	%	Intra-Article Steroid	%
≤60kgs	14	35	7	17.5
61-70 kgs	17	42.5	21	52.5
71-80 kgs	9	22.5	11	27.5
81-90 kgs	0	0	1	2.5
Total	40	100	40	100

Weight distribution	Platelet Rich Plasma	Intra-Article Steroid
N	40	40
Mean	63.6	67
SD	9.28	7.09
P value (unpaired t-test)	0.0693,NS	

33 (41.25%) patients (21 in PRP group & 12 in steroid group) were having normal BMI, 37 (46.25%) patients (12 in PRP group & 25 in steroid group) were overweight. 10 (12.5) patients (7 in PRP group & 3 in steroid group) were obese.

Table 5: BMI distribution

BMI distribution	Platelet Rich Plasma	%	Intra-Article Steroid	%
Underweight(≤18.49)	0	0	0	0
Normal(18.50 to24.99)	21	52.5	12	30
Overweight(25to29.99)	12	30	25	62.5
Obese(>30)	7	17.5	3	7.5
Total	40	100	40	100

BMI distribution	Platelet Rich Plasma	Intra-Article Steroid
N	40	40
Mean	25.81	26.4
SD	5.10	3.07
P value (unpaired t-test)	0.5343,NS	

Discussion

Osteoarthritis is a disorder of synovial joints characterized by focal loss of hyaline cartilage with proliferation of new bone and remodeling of joint contour, mainly due to uncoupling of balance between cartilage regeneration and degeneration. Osteoarthritis is a dynamic repair process of synovial joints that may be triggered a variety of insults [5].

We in our study had randomly chosen 80 patients with classic findings of Osteoarthritis and divided them in to two groups. Both the groups were comparable on baseline characteristics of age, height, weight, BMI, pre injection WOMAC score. Fourty of these patients were administered an intra-articular injection of Platelet Rich Plasma and other fourty received intra articular steroid.

The Efficacy of Platelet Rich Plasma in reducing pain, stiffness and physical function were assessed and scored on WOMAC index for both study and control group. The Results were analysed using unpaired t-test and chi-square test.

Age distribution revealed mean age in group I to be 58.32 and the mean age in Group II was 60.67.The p-value derived using unpaired t-test is 0.2585, rendering age factor insignificant.

Gender distributions were comparable on both groups with 43.75% being male 56.25% being female. The p valve using chi square test is 0.6525. The Gender factor was insignificant.

The mean height in group I was 157.83 and the mean height in Group II was 159.5.The p-valve using unpaired t test turned insignificant (0.3596).

The mean weight, in group I was 63.6 and group II was 67 with p-valve of 0.0693 (insignificant). The mean BMI was 25.81 in group I and 26.4 in Group II. The p-valve is 0.5343 (insignificant). Thus the study ensured that all patients were comparable on baseline characters.

Andrejs Elksniņ et al., in 2020 studied on "Intra-articular platelet-rich plasma vs. corticosteroids in the treatment of moderate knee osteoarthritis: A single center prospective randomized controlled study with a 1-year follow up". They demonstrated that, A single PRP or CS intra-articular injection is safe and improves the short-term scores of pain and the knee function in patients affected by mild to moderate symptomatic knee OA (with no significant differences between the groups). PRP demonstrated a statistically significant improvement over CS in a 1-year follow-up.

Pavalan Louis et al., in 2020 studied on "Role of platelet rich plasma in osteoarthrosis of knee joint among south Indian population". This study suggests using platelet rich plasma in osteoarthrosis of the knee joint as a cost effective and less complicated approach to relieve pain and improve day to day activities.

Ashutosh Kumar et al., in 2020 studied on "The Effect of Intra-Articular PRP (Platelet Rich Plasma) Injection in Knee Osteoarthritis - A Short Term Results". They concluded that, Platelet-rich plasma therapy is simple, cheap, feasible and minimally invasive intervention for early knee osteoarthritis. It reduces the analgesic intake and improves the function of knee joint in short term.

Conclusion

- Gender distributions were comparable on both groups with 43.75% being male 56.25% being female. The p valve using chi square test is 0.6525. The Gender factor was insignificant.
- The mean height in group I was 157.83 and the mean height in Group II was 159.5.The p- valve using unpaired t test turned insignificant (0.3596).
- The mean weight, in group I was 63.6 and group II was 67 with p-valve of 0.0693(insignificant).
- The mean BMI was 25.81 in group I and 26.4 in Group II. The p-valve is 0.5343(insignificant).

References

1. Knop E, de Paula LE, Fuller R. Platelet-rich plasma for osteoarthritis treatment. J Rbre. 2015;07:002
2. Guo Y, Yu H, Yuan L, Ya S. Treatment of knee osteoarthritis with platelet-rich plasma plus hyaluronic acid in comparison with platelet-rich plasma only. Int. J Clin. Exp. Med 2016;9(6):12085-12090.
3. Matto BD, Kon E, Filardo G. Intraarticular PRP for the treatment of osteoarthritis. Ann. Transl.

Med. Issn. 2016;2305-5839.

4. Dhillon MS, Patel S, John R. PRP in OA knee - update, current confusions and future options. SICOT J. 2017;3:27.

5. Kothari K. The role of platelet rich plasma; The current treand & evidence; Indian journal of pain. 2017;31:1-6

6. Elksniņš-Finogejevs A, Vidal L, Peredistijs A. Intra-articular platelet-rich plasma vs. corticosteroids in the treatment of moderate knee osteoarthritis: A single center prospective randomized controlled study with a 1-year follow up. Journal of Orthopaedic Surgery and Research. 2020;15:257.

7. Louis P, Sengodan VC, Palanivel R. Role of platelet rich plasma in osteoarthrosis of knee joint among south Indian population. Indian Journal of Orthopaedics Surgery. 2020;6(1):21-24.

8. Kumar A, Runu R, Kumar S, Kashyap N. The effect of Intra-articular PRP (platelet rich plasma) Injection in Knee Osteoarthritis - A short term results. J Indira Gandhi INST Med. Sci. 2020;6:57-61.