

# Knee Osteoarthritis: Steroids Versus Platelets Rich Plasma Effectiveness

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## Abstract:-

**Background:** This study compared the effectiveness of two therapy techniques for treating a certain medical condition: intra-articular steroid injection (Group A) and platelet rich plasma injection (Group B). The medial femorotibial compartment, for instance, frequently exhibits the highest decrease of joint space in the osteoarthritic knee. Treatment for osteoarthritis aims to reduce discomfort and enhance functional status. Medium-term improvements are seen with intra-articular platelet-rich plasma, balneotherapy, and whole-body vibration. The study is intended to demonstrate knee osteoarthritis and establish appropriate treatment guidelines. to determine the mean VAS score in individuals with knee osteoarthritis after intra-articular PRP or steroid injection and to evaluate which treatment is more effective at reducing pain for patients with osteoarthritis of the knee: PRP or steroid injections.

**Methodology:** Department of Orthopedics Surgery & Trauma, lady reading hospital peshawer, UPON ETHICAL Comitte Approval. Thirty patients with knee osteoarthritis were studied in each group from 1 JAN 2022 to 31 December 2022. PRP and steroid groups of patients were randomly assigned using randomization through non-probability consecutive sampling. SPSS-24 Version was used to recode and analyze the results of the CONTROL TRIAL. The male-to-female ratio, age distribution, and pain outcomes both before and after treatment were also examined in the study. The male-to-female ratio in Group A was 1:3, whereas the ratio in Group B was 1:3.75. Both therapies were used, and their

effects in reducing pain were evaluated. The results showed that both groups had a larger proportion of females. The groups' age distributions varied, but there were no statistically significant differences between them.

**Results:** The study consisted of 60 patients in total. They were evenly divided between the two groups. Patients in group A had a mean age of 59.93 years plus 7.48 standard deviations, whereas those in group B had a mean age of 61.68 years plus 7.22 SD. After treatment, when pain levels were compared, Group A reported 4.7+1.31SD of pain, whereas Group B reported 6.03+1.18SD of pain. This difference was statistically significant using an independent t-test, with a p-value of 0.000. Pre-treatment pain levels between Group A (mean: 7.93) and Group B (mean: 8.03) were comparable, and there was little change after therapy. In contrast, Group A showed a statistically significant reduction in pain following therapy (mean: 4.7) as compared to Group B (mean: 6.03).

**Conclusion:** This study highlights the potential advantages of intra-articular steroid injections versus platelet rich plasma injections for the treatment of pain.

**Keywords:-** Knee Osteoarthritis, Steroid, Platelet Rich Plasma.

## I. INTRODUCTION

Osteoarthritis (OA) is the continuous degenerative disease of joints. Its prevalence is from 13% to 71% in different countries of the world. In adults (age 56–84) in Malmo, Sweden, the prevalence of radiographic and symptomatic knee osteoarthritis were 25.4% (95% CI = 24.1, 26.1) and 15.4% (95% CI = 14.2, 16.7), respectively<sup>1</sup>. In Asian countries the knee OA is reported in a range of 13.1%-71.1%<sup>2</sup>. Pain is the hallmark symptom of knee osteoarthritis and its treatment is the main aim. The non-pharmacological modalities are patient education and self-management, exercises, weight reduction, walking supports (crutches), bracing, shoe and insoles modification, local cooling/heating, acupuncture, and electromagnetic therapy. Pharmacologic therapies can be summarized as paracetamol, non-steroidal anti-inflammatory drugs, opioids, and slow-acting drugs (glucosamine and chondroitin sulfate).

If orally administered drugs are ineffective, intra-articular (IA) injection (corticosteroids, viscos supplements, blood-derived products) is the last non-operative modality that can be preferred.

Use of PRP led to significant improvement in patient's outcomes at 6 months after injection, and these improvements were seen starting at 2 months and were maintained for up to 12 months compared to corticosteroids (df: 6, 35; F=32.0; P=0.001)<sup>4</sup>. Six articles (739 patients, 817 knees) 12 months<sup>3</sup>. PRP was significantly more helpful for relieving patients' pain (VAS) compared to corticosteroids, 39% males, mean age of 59.9 years, with 38 weeks average follow-up) in a meta-analysis were analyzed. All studies met minimal clinically important difference criteria and showed significant improvement in statistical and clinical outcomes, including pain, physical function, and stiffness, with PRP<sup>5</sup>.

A study showed the highest change in the VAS score from the baseline was at 3 months for the PRP group (mean: 4.6 ± 1.6; - 77%) and at 1 month in the CS group (mean: 3.4 ± 1.2; - 58%)<sup>6</sup>.

However there is no study done in our local population regarding the efficacy of PRP or steroid in the relieving pain of the patients with knee osteoarthritis.

The objective of this study is to find out the efficacy of intra-articular steroid versus PRP injection in patients with knee osteoarthritis as no study has been done in the last five years in our institute regarding the topic. The result of my study can be used for adaptation of one technique for the effective treatment of knee osteoarthritis to decrease the most disturbing symptoms of pain in such patients. Furthermore the result will be shared with other clinicians for the proof and evidence of treatment in such patients in our population.

## II. METHODOLOGY

Department of Orthopedics Surgery & Trauma, MMC MARDAN, upon ethical committee approval conducted the trial. Thirty patients with knee osteoarthritis were studied in each group from 1 Jan 2022 to 31 December 2022. PRP and steroid groups of patients were randomly assigned using randomization through non-probability consecutive sampling. By subtracting the VAS score from the baseline, the PRP group's score at three months was 4.6 ± 1.6 (or 77%) and the CS group's score at one month was 3.4 ± 1.2 (or 58%) Using the online Open Epi calculator, the sample size was 60 patients, with 30 in each group, with 90% power of research and a 95% confidence interval. Criteria that are inclusive All patients who, by operational definition, have osteoarthritis of the knee. Age restrictions ranged from 45 to 75. Traumatic OA and all individuals with a documented history of knee surgery are included in the exclusive criteria. Anyone who is receiving chemotherapy or radiation for a cancer of any kind. All those medical records of endocrine disorders like Cushing syndrome, etc. The aforementioned exclusion criteria were avoided since they skew the results of the study. The patient was randomly assigned to the PRP and steroid groups. Age, gender, and the length of the knee pain were recorded. It was noted the VAS pain rating. PRP or steroids were injected in an aseptic environment in accordance with the operational criteria. The patient was instructed to return every month for three months. The researcher gathered all the information and recorded it in the pre-specified proforma with written informed consent. For quantitative factors including age, the length of knee pain, and VAS score at presentation and at each visit, means and standard deviation were shown. For a qualitative characteristic like gender, frequencies with percentages were reported. Age, gender, the length of knee discomfort, and the VAS score at presentation and at each visit were compared for the two groups. The difference between the means of the two groups' VAS scores was compared. After comparison, the chi-square test was used to compare frequencies, and the student t-test was used to compare means. P 0.05 was regarded as statistically significant. Tables were used to present all of the results.

## III. RESULTS

A total of 60 patients of patient with knee osteoarthritis were included in the study, which were divided in two equal groups. Patients in Group A were managed by intra articular steroid injection and another Group B, patients were going through autologous platelet rich plasma injection. Gender wise distribution shows that 10(33.3%) were male and 20(66.7%) were female in Group A with male to female ratio was 1:3 while Group B contains 8(26.7%) were male and 22(73.3%) were female with male to female ratio was 1:3.75. Overall Male to female ratio was 1:3.3. Sex distribution among the groups shows the female preponderance but it was statistically insignificant with p-value=0.389. Average age was 59.93years + 7.48SD in Group A and contains 2(6.7%) patients having less than 50 years, 16(53.3%) patients 51-60 years, 9(30%) patients 61-70 years and 3(10%) patients having age more than 70

years. While Group B have average age of 61.68 years +7.22SD and contains 3(10%) patients in less than or equal to 50 years, 11(36.7%) in 51-60 years, 13(43.3%) in 61-70 years and 3(10%) patients have age more than 70 years of age. The overall average of the patients was 60.68 years +7.37SD. The age distribution among the group was also insignificant with p-value 0.603. Pain wise distribution shows that group A have average pain of 7.93+1.205SD while in group B, it was 8.03+1.18SD at presentation which was insignificant with p-value = 0.747. when pain was compared after the treatment than Group A showed 4.7+1.31SD and Group B have observed 6.03+1.18SD pain and it was statistically significant by using independent t-test with p-value=0.000. When pain was stratified among the age over both the group it was shown that except the age of rang 61-70 years the rest of age group were insignificant pain in both the groups. Similarly when pain of the patients was stratified among gender it shows that pain was insignificant in male and female also in both the groups. While stratification of pain over duration of pain shows that pain was little bit high in patients having more than 1 year but this was insignificant.

Table 1: Gender distribution between groups

<b>Group A Intra articular steroid injection Male to female ratio: 1:3</b>		<b>Group B Platelet rich plasma injection male to female ratio: 1:3.75</b>		<b>p-value for both</b>
MALE	10 (33.3%)	Male	8 (26.7%)	0.389
Female	20 (66.7%)	Female	22 (73.3%)	

Table 2: AGE distribution in both groups

<b>Group A</b>		<b>Group B</b>		<b>P value for both groups</b>
< 50 years	2 (6.7%)	< 50 years	3(10%)	0.603
>50 years	16(53.3%)	>50 years	11(36.7%)	
>60 years	9(30%)	>60 years	13(43.3%)	
>70 years	3(10%)	>70 years	3(10%)	

Table 3: pain distribution

<b>Before treatment Average pain</b>		
<b>Group A</b>	<b>Group B</b>	<b>P value</b>
7.93± 1.20 SD	8.03 1.18SD	0.747
<b>After treatment Average pain</b>		
<b>Group A</b>	<b>Group B</b>	<b>Independent t-Test with p value</b>
4.7 1.31 SD	6.03 1.18 SD	0.00

#### IV. DISCUSSION

The Group A data analysis provides insight into the effects of intra-articular steroid injections on pain control. Notably, the 1:3 male to female ratio indicates that there are more women in this treatment group. The prevalence of the medical illness among females or variations in treatment-seeking behavior are a few causes of this gender gap. One of the therapy options for OA knee is intra-articular injection of autologous PRP. The majority of research on autologous PRP injection has been on ways to lessen pain and enhance quality of life. 78 patients with OA knee underwent a randomized control experiment by study<sup>7</sup>. Patients were randomly assigned to one of three groups, each of which got a single injection of PRP, two injections of PRP spaced three weeks apart, and one injection of NS. Using the WOMAC questionnaire, clinical outcomes were assessed. The fact that Group A's age distribution shows a wider representation of older and younger age groups suggests that this treatment is appropriate for people of all ages. Due to the relatively equal age distribution of the two treatment groups (as shown by the p-values), there is less chance of bias because there are no significant differences in age distribution between the two groups. Within two to three weeks, all WOMAC values in the first and second groups showed statistically significant improvements that persisted through the final follow-up at six months. The mean WOMAC score decreased in the NS group from the baseline to the last follow-up. Additionally, their study revealed comparable VAS values in patients who had received one or more PRP injections. As a result, we used only one PRP injection in test knees.

The intra-articular PRP injection used in their study demonstrated improvement in pain and daily physical activity on the Knee Injury and Osteoarthritis Outcome Scores (KOOS) measures<sup>8</sup>. VAS, SF-36, WOMAC, and Lequesne index all improved with intra-articular Platelet Rich Plasma (PRP), according to studies<sup>9-10</sup>

Injections of Platelet Derived Growth Factor (PRGF) were found to alleviate pain and quality of life more effectively than injections of hyaluronic acid (HA) according to the Migliorini F et al study<sup>11</sup>.

In the PRP and HA group, Sohail A et al examined the WOMAC and SF36 questionnaires. With PRP, they obtained superior outcome<sup>12</sup>. In a patient trial, intra-articular PRP and exercise were compared by Kang, J. et al. Even though both groups' VAS scores dramatically decreased till the end of the research, the PRP group's mean time to experience intolerable knee pain during treadmill exercise significantly increased from the starting point<sup>13</sup>. The effectiveness of intra-articular PRP injection in advanced OA knee was investigated by Xiao, J. et al. They found no statistically significant difference between PRP and intra-articular corticosteroid injection<sup>14</sup>

When compared to m-HA injections, m-PRP injections for KOA patients might more successfully reduce pain, improve joint function, and enhance quality of life via the VAS scores, MOWAC scores, IKDC scores, and EQ-VAS ratings. M-PRP injections are suggested as adjuvant therapy for treating KOA notwithstanding the small number of trials that have been reported. Furthermore, it's important to standardize PRP preparation, injection intervals, and dosage in research. According to the included RCTs, the recommended PRP intervals were one or two weeks, and the recommended PRP dosage was 4-6 ml<sup>15</sup>.

In contrast, the scores in the placebo group declined from 9.04 at the beginning to 10.87 at the end of the study. In a related study, the VAS score for the PRP group was 4.640.56 at pre-injection and 2.541.71 at 6 months' follow-up, while it was 4.570.62 and 4.610.74 for the placebo group (P value = 0.001).

In comparison to IA-Saline, the 2-4 and 5 injection regimens both reduced pain. Patients with knee OA benefited most from intra-articular injections of HA when compared to IA-Saline in terms of pain relief, and these injections were generally regarded as safe with few to no treatment-related adverse events (AEs) noted by Concoff, A. et al<sup>16</sup>.

For at least a year, patients with mild to severe osteoarthritis of the knee may benefit from intra-articular injections of PRP deficient in leukocytes. Lin, K.-Y., and others all studied<sup>17</sup>

When compared to the corticosteroid group, the PRP group significantly improved in terms of pain, symptoms, activities of daily living, and quality of life at the second and sixth month follow-ups. According to reports, platelet-rich plasma is a safe procedure with no major side effects. Pain, swelling, and a modest effusion are minor adverse effects associated with intra articular injections that can last a few days<sup>18-19</sup>. The study's early findings regarding the distribution of pain indicated that Groups A and B had identical average pain levels prior to therapy, indicating similar baseline pain severity. However, following therapy, there was a statistically significant difference between the mean pain levels in Group A (mean: 4.7) and Group B (mean: 6.03). This obvious difference following therapy demonstrates the potential efficacy of intra-articular steroid injections over platelet rich plasma injections in providing pain alleviation. The robustness of this discovery is highlighted by the low p-value (0.00).

Given that there have been no significant adverse events or problems, PRP injection therapy can be regarded as safe. We believe that the minimally invasive procedures used to administer PRP and the absence of any risk of infectious disease transmission (due to the fact that it is an autologous therapy) are the two key reasons for its safety.

Yurt bay, showed favorable results in IKDC and VAS score<sup>20</sup> at the end of their 2-year follow-up trial<sup>20</sup>. According to the findings from Group A, intra-articular steroid injections are linked to a more significant decrease in pain than platelet rich plasma injections. This finding lends credence to the idea that addressing the medical condition under consideration may benefit more from intra-articular steroid injections. However, additional study is required to validate and generalize these findings and to better comprehend the mechanism underlying the disparate outcomes between the two therapies. This additional research may involve randomized controlled trials and longer-term follow-up.

## V. CONCLUSION

The learning curve for PRP treatment is steep because it is a more recent procedure. Even if conventional therapy is still the most frequently employed procedure, PRP treatment for osteoarthritis of the knee in adults is a suitable alternative that is more effective. According to the results of our study, we advise treating patients with knee osteoarthritis with platelet rich plasma for a better outcome because it is both safe and affordable, offers quick symptom relief, and promotes an early recovery to nearly full function.

## LIMITATION

The intervals of PRP and HA injections were different further investigate the effects of other variables, such as product molecular weight, in the comparison of IA-HA injection treatment regimens. This was single based study It is also advised that more randomized, double-blind trials be conducted with bigger sample numbers to support our findings.

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