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Original Article

Comparison of Efficacy Between Intra-Articular Tramadol versus Intraticular Corticosteriod Injection in Knee Osteoathritis

Muhammad Adnan Afsar, Ziauddin Khan, Adnan Anwar, Shoaib Zardad, Muhammad Awais Jameel, Tahir Nawaz

Department of Orthopedic Surgery, Combined Military Hospital, Abbottabad /National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: To compare the efficacy between intra-articular Tramadol versus intra-articular corticosteroid injection in knee osteoarthritis.

Study Design: Quasi Experimental Study.

Place and Duration of Study: Department of Orthopedic Surgery, Combined Military Hospital, Abbottabad Pakistan from Mar to Sept 2022.

Methodology: The study included 92 individuals who were diagnosed with knee osteoarthritis by a consultant orthopaedic surgeon and who presented with joint discomfort (WOMAC Score > 35mm). Two groups of forty-six patients each were formed through lottery method. The first group of patients received injections of intra-articular corticosteroids, whereas the second group received injections of intra-articular Tramadol. At the 4, 8, and 12 week follow-up appointments, patients were evaluated again. Pain, stiffness, and physical function were evaluated using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) version 3.1. The pain scale ranged from 0 (no pain) to 100 (worst possible pain), and the effectiveness was determined by the amount of alleviation observed. A 70% decrease in symptoms from baseline was considered an efficacy label.

Results: In terms of alleviating symptoms of Knee Osteoarthritis, intra-articular corticosteroid injection was found to be considerably better than intra-articular Tramadol injection, in 40 cases (87.0%) compared to 22 cases (47.8%), with a *p*-value of less than 0.001.

Conclusion: Injections of intra-articular corticosteroids were far more effective than injections of intra-articular Tramadol in alleviating symptoms and improving WOMAC scores in patients suffering from knee osteoarthritis, according to this research.

Keywords: Knee, Osteoarthritis, Intra-articular Corticosteroid Injection, Tramadol Injection.

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INTRODUCTION

A common joint disorder, osteoarthritis of the knee can limit a person's mobility and cause them discomfort. Wear and tear, together with the gradual degradation of articular cartilage, is the usual cause of osteoarthritis (OA), a degenerative joint disease, in the knee. The elderly seem to have it more frequently. There are two main categories of knee osteoarthritis: primary and secondary. Articular degeneration that does not seem to have an underlying cause is known as primary osteoarthritis. In cases of rheumatoid arthritis (RA) or aberrant articular cartilage, such as in post-traumatic situations, or an abnormal distribution of force across the joint, secondary osteoarthritis develops.[1,2,3]

Based on its aetiology, osteoarthritis of the knee can be categorised as either primary or secondary. Degeneration of the articular cartilage in the knee occurs for no apparent cause in primary osteoarthritis. Degeneration owing to age and wear and tear is the usual explanation. When articular cartilage degenerates for an identifiable cause, it leads to secondary osteoarthritis of the knee.[4,5] Injecting medicine into the joint is one way to treat osteoarthritis of the knee, a process known as intra-articular injection. Medications like corticosteroids are often considered for this purpose, while alternatives like Tramadol have also been researched. A number of studies have looked into the effectiveness of various intra-articular injections for knee osteoarthritis; they have included ketorolac, platelet-rich plasma, and corticosteroids.[6,7,8,9] A study included patients with knee osteoarthritis showed a non-significant difference (p=0.080) between the two groups when injected with intra-articular corticosteroids (88.37%) and Tramadol (63.89%).[10] There is a need for additional research to discover the best successful treatment option for knee osteoarthritis, therefore this study compared the

Correspondence: Dr Muhammad Awais Jameel, Department of Orthopedic Surgery, Combined Military Hospital, Abbottabad Pakistan
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efficacy of Tramadol with that of intraarticular corticosteroid injection.

METHODOLOGY

This quasi-experimental study was carried out at the Department of Orthopaedic Surgery at CMH Abbottabad Pakistan from March 2022 to September 2022. Ethical approval was obtained from the Ethical Committee (file no: CMH ATD-ETH-73-Ortho-22). Using 80% power of test and 5% significance level, the sample size was determined using the WHO Sample Size calculator by taking 88.7%,[11] proportion of efficacy with intra-articular corticosteroid injection versus 63.89%,[11] proportion of efficacy with intra-articular Tramadol injection. The data was collected using a nonprobability consecutive sampling technique.

Inclusion Criteria: Included were male and female patients diagnosed with knee osteoarthritis by a consultant orthopaedic surgeon, who were 50 to 80 years old and exhibited symptoms of knee joint discomfort (WOMAC Score > 35 mm).

Exclusion Criteria: Patients requiring knee surgery due to joint disease or damage were not included, nor were those with any major comorbid conditions.

Following a thorough explanation, all participants in the study were asked to provide written informed consent. Consultant orthopaedic surgeon made the diagnosis of knee osteoarthritis based on patient history and physical examination findings, which included progressive, gradually worsening discomfort, edoema, stiffness, and pain after extended periods of sitting or resting. Using blocked randomization, the patients were split into two groups. The first group of patients received injections of intra-articular corticosteroids, whereas the second group received injections of intra-articular Tramadol. Patients were evaluated during their fourth, eighth, and twelfth week of follow-up appointments. Pain, stiffness, and physical function were evaluated on a 100 mm Visual Analogue Scale (VAS) (0 representing no pain and 100 mm worst possible pain) by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) version 3.1. Efficacy was defined as the degree to which symptoms were alleviated. When pain scores dropped 70% or more from baseline, we knew we had achieved efficacy.

Statistical Package for the Social Sciences (SPSS) Version 23.0 was used for data entry and analysis. The Mean±SD was used to display quantitative variables in both groups. Frequencies and percentages were used to show qualitative data in both groups, including gender, knee involved, and efficacy. We analyzed quantitative variables using an independent samples t-test and qualitative variables using a chi-square test, with a significance level of p-value ≤ 0.05 for each.

Table-I: Demographic and Clinical Characteristics of Patients with Knee Osteoarthritis in Both Groups (n=92)

Categorical Variables	Study Groups		p-value
	Group A (n=46)	Group B (n=46)	
Gender, n (%)			
Male	17(37.0%)	24(52.2%)	0.142
Female	29(63.0%)	22(47.8%)	
Knee Involved, n (%)			
Right	13(28.3%)	20(43.5%)	
Left	16(34.8%)	12(26.1%)	0.309
Bilateral	17(37.0%)	14(30.4%)	
Efficacy, n (%)			
Yes	40(87.0%)	22(47.8%)	<
No	06(13.0%)	24(52.2%)	0.001

RESULTS

A total of ninety-two patients were included in this study. Out of 92 patients with knee osteoarthritis, 46 patients were managed with intra-articular corticosteroid while the remaining 46 patients were subjected to intra-articular Tramadol. Intra-articular corticosteroid injection proved significantly superior to intra-articular Tramadol injection in terms of relief in symptoms in knee osteoarthritis i.e 40 (87.0%) vs 22 (47.8%) with (p-value <0.001). Normality of data was checked through Shapiro-Wilk Test (P<0.001). WOMAC Score between the groups showed significant improvement in patients subjected to intra-articular corticosteroid injection as compared to intra-articular Tramadol injection from the baseline with 3.87+3.52 mm vs 8.87+4.85 mm; p-value<0.001 respectively (Table-II).

Table-II: Baseline and Follow up Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) Score at the Baseline, 4th , 8th and 12th Week in Both Groups (n=92)

Outcome Variables	Study Groups		p-value
	Group A (n=46)	Group B (n=46)	
	Mean+SD	Mean+SD	
Baseline WOMAC Score (mm)	31.61+4.92	31.87+4.85	0.799
WOMAC Score at 4th Week (mm)	24.46+4.24	21.76+3.23	0.700
WOMAC Score at 8th Week (mm)	16.41+4.82	16.28+4.57	0.894
WOMAC Score at 12th Week (mm)	3.87+3.52	8.87+4.85	<0.001

WOMAC: Western Ontario and McMaster Universities Osteoarthritis Index

DISCUSSION

In a study comparing the effectiveness of intra-articular Tramadol and intra-articular corticosteroid injection for knee osteoarthritis, the results showed that the latter was far more effective in relieving symptoms (87.0% of patients reported relief compared to 47.8% for intra-articular Tramadol injection). Both the intra-articular Tramadol and intra-articular corticosteroid injection groups demonstrated statistically significant improvements in the WOMAC score. These results are in line with other research that looked at the effectiveness of several intra-articular injections for knee osteoarthritis, such as ketorolac, platelet-rich plasma, and corticosteroids.[12,13,14]

Keep in mind that each patient is unique, and that the severity of their ailment and other factors may affect how well various treatments work. For instance, oxaceprol was shown to be just as effective and tolerable as intra-articular Tramadol in a randomised controlled trial comparing the two drugs for knee osteoarthritis. In addition, corticosteroids may provide moderate pain relief and modest functional improvement for knee osteoarthritis, according to a Cochrane analysis of intra-articular corticosteroid injections.[15,16,17]

Patients suffering from osteoarthritis have long been advised by medical professionals to inject intra-articular corticosteroids in order to alleviate pain and inflammation. One treatment paradigm for osteoarthritis of the knee proposed by the American College of Rheumatology involves injecting corticosteroids into the joint. Corticosteroids, when injected intravenously into the joint, not only reduce inflammation and discomfort, but also prevent additional structural damage.[18] Further research is necessary to find the most appropriate treatment for individual individuals, although intra-articular corticosteroid injection seems to be a beneficial alternative for knee osteoarthritis.

LIMITATIONS OF STUDY

The main limitations were attributed to small sample size as the study included a total of 92 patients, which may not be representative of the larger population of individuals with knee osteoarthritis. The study only followed patients for a short period of time, which may not be sufficient to fully evaluate the long-term efficacy and safety of the treatments. Moreover, the study was not blinded, which may have introduced bias into the results. It is important to consider these limitations when interpreting the results of the study and to recognize that further research is needed to fully evaluate the efficacy and safety of different treatment options for knee osteoarthritis.

CONCLUSION

The results showed that when comparing the two injection methods for knee osteoarthritis, intra-articular corticosteroid injection considerably improved symptom alleviation and WOMAC score improvement compared to intra-articular Tramadol injection. To thoroughly assess the effectiveness and safety of various treatment options for knee osteoarthritis, additional study is necessary. Patients suffering from knee osteoarthritis who are looking for symptom relief may find success with intra-articular corticosteroid injection, according to the study's overall conclusions.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

MAA 7 ZK: Data acquisition, data analysis, critical review, approval of the final version to be published.

AA & SZ: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

MAJ & TN: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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