

Evaluation of Efficacy of Intra-Articular Injection of Inj Methylprednisolone Versus Inj Triamcinolone in Knee Joint Osteo Arthritis

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Abstract

Background and Aims: OSTEOARTHRITIS (OA) of the knee is one of the most common rheumatic disorders and a frequent cause of pain and disability, particularly for elderly. Present clinical study was designed to evaluate and compare efficacy of intra-articular inj. METHYL PREDNISOLONE 40 Mg versus Inj TRIAMCINOLONE 40mg with local anesthetic agent in patients having osteoarthritis knee.

Methods: In the present study 60 patients between the ages of 30 and 80 years having Osteoarthritis Knee were divided into 2 random groups, Group D (n=30) Methylprednisolone group and Group T (n=30) Triamcinolone group. Both groups compared for pain relief by Visual analogue score (VAS), Behavioral pain score, Subjective pain score, social and psychological aspects of life by Knee osteoarthritis outcome score (KOOS) And New Oxford Knee score.

Results: Study reveals improvement in VAS score, Behavioral pain score, subjective pain score, KOOS questionnaire, quality of life, work performance, sleep pattern, feeling of hope for life, enjoyment of recreational activity without pain was similar in both groups up to 6th week of intra-articular injection. But improvement in New Oxford knee score was found to be better in patients who received intra-articular administration of Methylprednisolone Group D (37.36±3.13) with local Anesthetic compared to those who received Inj. Triamcinolone group T was (34.43±5.98) with local anesthetic which is statistically significant (P=0.02).

Conclusion: we conclude that intra-articular Inj Methylprednisolone and inj Triamcinolone are equally effective without side effects with Regular physiotherapy for Osteoarthritis Knee.

Keywords: Osteoarthritis knee, intra articular injection, Methylprednisolone, Triamcinolone.

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Introduction

Osteoarthritis is a disease characterized by a mixture of degenerative and reparative process in the articular cartilage, subchondral bone associated with marginal osteophytes formation, and low grade inflammation. It involves mainly the hips, knees, spine and the interphalangeal

joints.[1,2] Osteoarthritis (OA) of the knee is one of the most common rheumatic disorders and a frequent cause of pain and disability, particularly among the elderly. It is estimated that between 18 and 33% of individuals over 65 years of age have radiographic evidence of knee OA, this

being more common in women and increasing to over 50% by age 80.[3] During the past decade much has been learned about cartilage, including metabolic changes, genetic mutations, metalloproteinases, and inflammatory mediators, fostering considerable excitement and interest to new approaches for preventing and treating osteoarthritis by using intra-articular drugs that can be directly injected into the joint, which can ensure a high local drug concentration and low systemic side-effects. Physiotherapy, bracing and lifestyle modifications including weight reduction are among many of the physical option available.[4] There are basic three modalities for treatment of osteoarthritic knee by physiotherapy, pharmacotherapy and surgical measures such as total knee replacement (TKR). Oral pharmacological strategies such as simple analgesics, Non – steroidal anti-inflammatory drugs (NSAIDs), corticosteroids (CS) and dietary supplements such as glucosamines are all routinely used in an attempt to control pain.[5]

While these approaches may initially be useful and provide adequate pain relief, they may not work effectively for every patient and therefore, another option is the use of intra-articular injections which has attracted increasing level of interest in recent years. The intra-articular therapy is much beneficial in terms of cost effectiveness, less systemic side effects and more improvement in quality of life. Other options like surgery have poor patient satisfaction, poor outcome and lack of cost-effectiveness. This study was conducted to compare the efficacy of Methylprednisolone and Triamcinolone intra-articular injections along with local anesthetics. It has been shown that intra-articular CS has property of normalizing cartilage proteoglycan synthesis and significantly reduces the incidence and severity of cartilage erosion an osteophyte formation.

Materials and Methods

This study was conducted Department of Anesthesia, Shri M P Shah Government Medical College, Jamnagar, Gujarat. After obtaining institutional ethical committee approval and written informed consent of 60 patients of both sexes suffering from Osteoarthritis knee between the age groups of 30 to 80 years, they were divided randomly into 2 groups of 30 patients each.

Group T (n=30) - Inj Triamcinolone 40 mg with Inj. Bupivacine 0.5% 5ml + inj. Lignocaine 2% 5ml

Group D (n=30) – Inj Methyl prednisolone 40 mg with Inj. Bupivacine 0.5% 5ml + Inj. Lignocaine 2% 5ml

Inclusion Criteria

- Age between 30 to 80 years
- Weight <100 kgs
- Chronic Knee pain with signs and symptoms of osteoarthritis like
 - Knee Joint pain
 - Non traumatic and Senile changes
 - Knee Joint stiffness
 - Crepitus
 - Alteration in Joint Space
 - Functional Impairment
 - Crepitus
 - Restricted joint movement
 - Tenderness
 - Knee Swelling
 - Limp
 - Muscle atrophy or Weakness
 - Instability

Exclusion Criteria

- Patient's refusal
- Age <30 years
- Obesity that is severe enough to make penetration of the joint difficult.
- Major organ disease
- History of drug allergy
- Severe skin disease
- Uncontrolled Diabetes mellitus
- Altered coagulation profile.
- History of trauma over knee

- Infection at local site
- Severe joint destruction or deformity

All the patients were asked for detailed History about the Site of pain, Character of pain, Intensity of pain, Duration of pain, Frequency, Radiation of pain, Tenderness, Pain relieving factors, Pain accentuating factors, Effect of exertion on pain, Sleep disturbances due to pain, Psychological problems caused by chronic pain, Effect of pain on activity and Quality of life were noted. Patients were also clinically examined. Details about past treatments in the form of allopathic, Ayurveda, homeopathic and/or local application of cream, ointments were applied was evaluated and noted. Detailed history and examinations were taken and performed to rule out other Medical conditions like Diabetes mellitus, Hypertension, Rheumatoid arthritis, Gout etc. All these patients were investigated for Random blood sugar (RBS), Hb, Urine-sugar & acetone and X-ray knee antero-posterior and lateral view.

Vitals like Temperature, Pulse rate, Respiratory rate, Blood pressure were monitored and noted. Before giving intra articular injection a written informed consent was taken and all patients were explained in their own language about the Visual analogue scale (VAS) score, behaviour pain score (BPS), subjective pain scale (SPS) and all the three scores were noted with New Oxford Knee Score

Questionnaires and Knee Injury and Osteoarthritis Outcome Score (KOOS) before the intra articular injection was given.

Intra-Articular Injection

In Group D, Inj Methyl prednisolone 40 mg with inj. Bupivacaine 0.5% 5ml + inj. Lignocaine 2% 5ml was given intra-articularly with aseptic precautions via anterolateral or anteromedial approaches after giving a test dose of local anesthetic agents. **In Group T**, Inj Triamcinolone 40 mg with inj. Bupivacaine 0.5% 5ml + inj. Lignocaine 2% 5ml was given. Patients were asked to come for follow up on day 1, 2, 3, 7, 14, 21 and on 6th week after injection. Patients were also advised to start physiotherapy 3rd day post injection onwards. During this follow up detailed history related to pain relief and improvement related to quality of life with help of VAS SCORE, KOOS SCORE, NEW OXFORD KNEE SCORE and adverse effects were taken.

After completion of study, statistical analysis of observations was done by SPSS software. Unpaired and paired T tests were done for quantitative data. Statistical significance was assumed at $p < 0.05$.

Results

The demographic data was comparable with no statistically significant difference.

Table 1: Demographic Data, Age, Sex, Weight of the Patients

	Group D	Group T	P Value	Inference
Age (Years) Mean±S.D.	54.97±8.02	56.73±8.03	0.399	Not Significant
Sex (M:F)	1:5	1:4		
Weight (Kg) Mean±S.D.	68.73±13.14	67.97±12.62	0.820	Not Significant

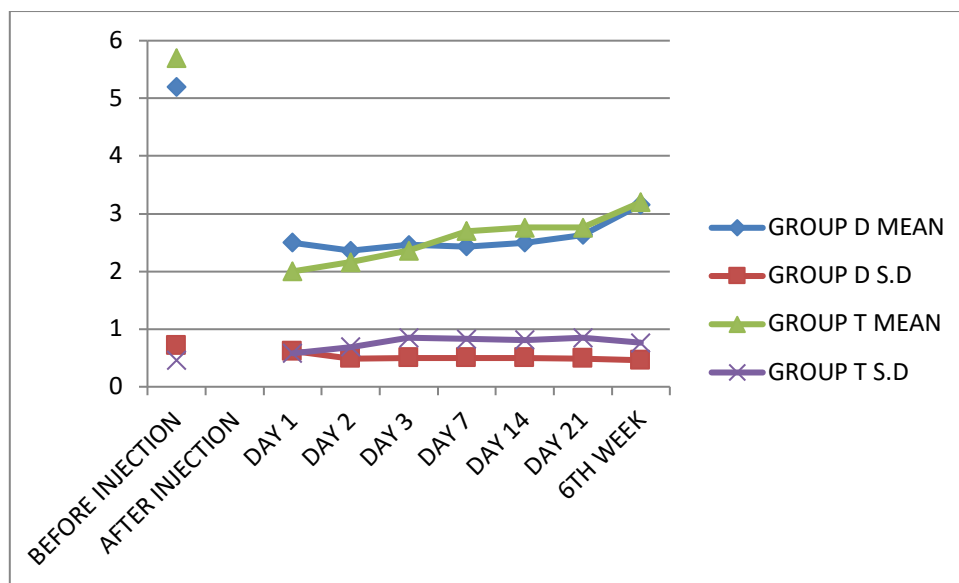


Figure 1: Comparison Of Visual Analogue Score (VAS) Before Intra-Articular Injection And After Intra-Articular Injection On Day 1,2,3,7,14,21,6th Week.

After intra-articular injection there is significant reduction in pain. Mean VAS score on Day 1 after injection in Group D was 2.5 ± 0.62 and in Group T was 2 ± 0.58 which was Statistically very significant ($P=0.0021$). There was no statistical significant difference on the other days of follow up.

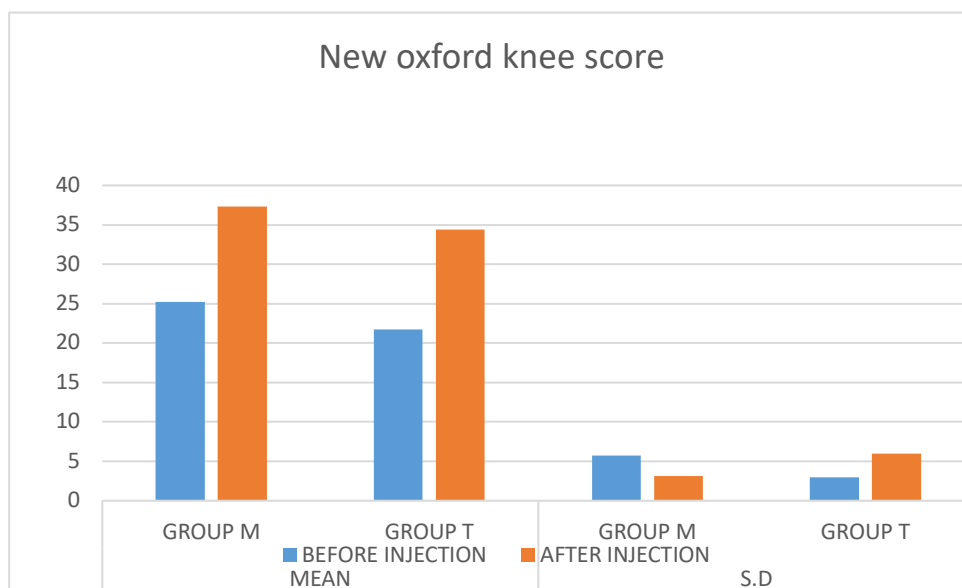


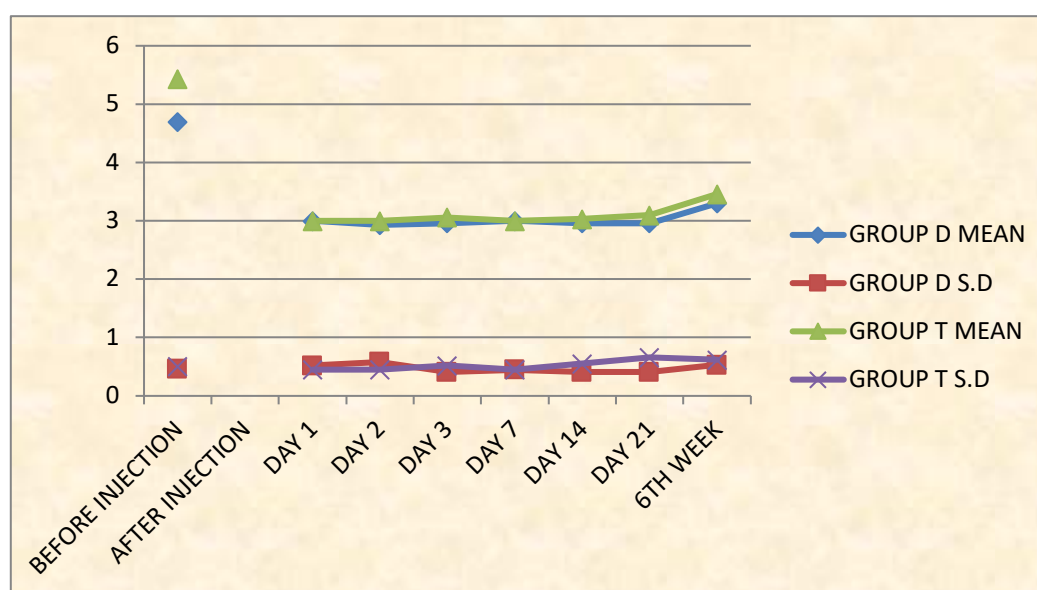
Figure 2: Comparison of New Oxford Knee Score Before Intra-Articular Injection and After Intra-Articular Injection On 6th Week.

Above Graph shows that Before intra-articular injection mean new oxford knee score for Group D was 25.26 ± 5.75 and for Group T was 21.7 ± 2.99 . After intra-articular injection on 6th week, the mean new oxford knee score for group D was

37.36 ± 3.13 and of group T was 34.43 ± 5.98 , which was statistically found to be significant ($P=0.02$) showing that Group D was better than Group T according to New Oxford Knee Score.

Table 2: Comparison Of Behavioural Pain Score (BPS) Before Intra-Articular Injection And After Intra-Articular Injection On Day 1,2,3,7,14,21, 6th Week

	Group D		Group T		p value	Significance
	Mean	S.D	Mean	S.D		
Before Injection	4.7	0.46	5.43	0.50	-	-
After Injection						
Day 1	3	0.52	3	0.45	1.0	NS
Day 2	2.93	0.58	3	0.45	0.60	NS
Day 3	2.96	0.41	3.06	0.52	0.41	NS
Day 7	3.0	0.45	3	0.45	1.0	NS
Day 14	2.96	0.41	3.03	0.55	0.57	NS
Day 21	2.96	0.41	3.1	0.66	0.32	NS
6th Week	3.3	0.53	3.46	0.62	0.28	NS

**Figure 3: Comparison Of Behavioural Pain Score (BPS) Before Intra-Articular Injection And After Intra-Articular Injection On Day 1, 2, 3, 7, 14, 21, 6th Week**

Above table 3 and graph 3 shows that the mean BPS score before intra-articular injection in Group D was 4.7 ± 0.46 and in Group T was 5.43 ± 0.50 . Maximum pain relief caused by both the Groups in the form of BPS was found to be statistically not significant ($p < 0.05$).

Table 3: Comparison Of Subjective Pain Score (SPS) Before Intra-Articular Injection And After Intra-Articular Injection On Day 1, 2, 3, 7, 14, 21, 6th Week

	Group D		Group T		P Value	Significance
	Mean	S.D	Mean	S.D		
Before Injection	4.06	0.58	5.13	0.57	-	-
After Injection						
Day 1	2.26	0.44	2.16	0.46	0.39	NS
Day 2	2.16	0.37	2.13	0.50	0.79	NS
Day 3	2.13	0.34	2.16	0.53	0.79	NS
Day 7	2.13	0.34	2.36	0.85	0.17	NS
Day 14	2.16	0.37	2.5	0.86	0.051	NS

Day 21	2.16	0.37	2.56	0.89	0.026	S
6th Week	3.03	0.18	3.2	0.66	0.17	NS

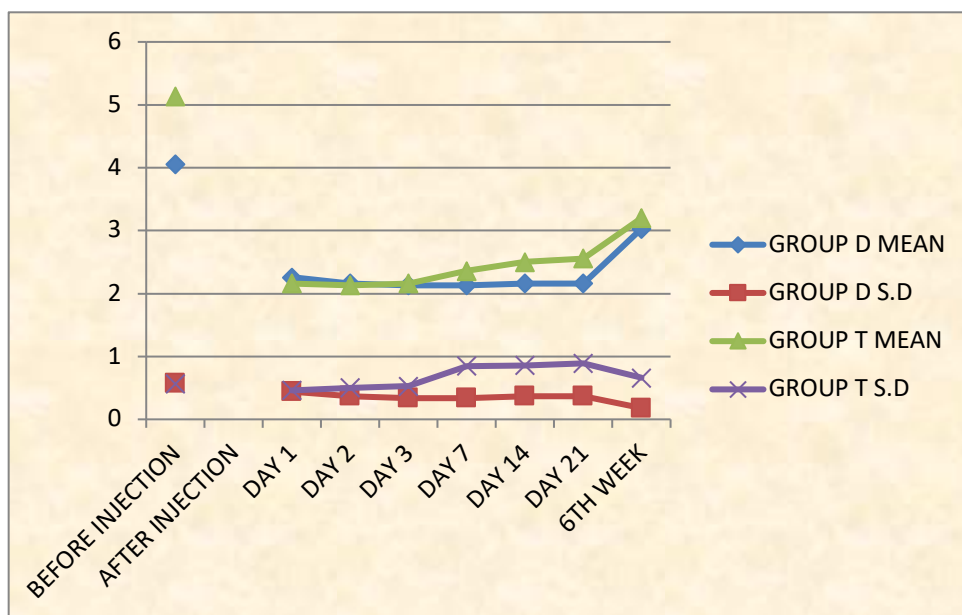


Figure 4: Comparison of Subjective Pain Score (SPS) Score Before Intra-Articular Injection and After Intra-Articular Injection on Day1,2,3,7,14,21,6th Week

The mean SPS score before intra-articular injection in Group D was 4.06 ± 0.58 and in Group T was 5.13 ± 0.57 . The difference of SPS score between the 2 groups was found to be statistically insignificant at days 1, 2, 3, 7, 14 and 6th week with P value of 0.39, 0.79, 0.79, 0.17, 0.051, 0.17 respectively ($p > 0.05$) while it was found to be significant on day 21 with p value 0.026.

Discussion

Pain is not just a sensory modality, but is an experience. It is the most common symptom that brings patients to see a physician. And it nearly always manifests as a pathological condition. Hence, management of pain is very important. The real art of medicine lies in the treatment of pain.[6]

In our study, VAS scores indicated that difference of VAS score between the 2 groups was found to be statistically insignificant at 0, 3rd and 6th week with P

value of 0.132, 0.47 and 0.80 respectively ($p > 0.05$).

Jain P et al[7] conducted a study of comparison of efficacy of methylprednisolone and triamcinolone in osteoarthritis of the knee and found that VAS score after giving intra-articular injection at 0 and 4th week in group receiving methylprednisolone was 8.78 ± 1.31 and 7.56 ± 1.09 while another group receiving triamcinolone, it was 8.27 ± 0.98 and 7.12 ± 1.34 which indicates difference of VAS score in between both study group was found to be statistically insignificant at 0 and 4th week with ($p = 0.09$) and ($p = 0.17$) respectively.

Kumar A et al did a study[8] found that VAS score after intra-articular injection at 4th and 12th week in group receiving methylprednisolone was 3.2 ± 2.0 and 2.8 ± 2.4 respectively. And in group receiving triamcinolone was 3.1 ± 2.2 and 3.4 ± 3.1 with p value at 4th week 0.54 and

at 12th week 0.87 which was found to be statistically insignificant.

Shikhar et al.[9] did a study of prospective clinical evaluation between intra-articular injection of methylprednisolone and triamcinolone in osteoarthritis of knee based on the efficacy, duration and safety was found that VAS score after giving intra-articular injection at 0, 4th and 8th week in group receiving methylprednisolone was 6.56 ± 1.01 , 5.35 ± 1.01 and 4.32 ± 1.2 respectively. In group receiving triamcinolone, it was 6.73 ± 1.2 , 6 ± 1.57 and 4.54 ± 1.32 with p values at 0, 4 and 8 week of 0.275, 0.016 and 0.746 respectively which indicates difference of mean VAS score between the 2 groups was statistically insignificant in 0 and 8th week while in 4th week it was found to be statistically significant

D paine et al. conducted a study [10] to compare effectiveness of triamcinolone hexa-acetonide and methylprednisolone acetate given via the intra-articular route with equipotent dosage to patient with symptomatic knee osteoarthritis. Assessment was made at 0, 3 and 8 weeks. Outcome measured at each visit with VAS score found that both steroids gave significant pain relief. The above studies are comparable with our study

In our study baseline BPS score in group D was 4.7 ± 0.46 and in group T was 5.43 ± 0.50 . After giving intra-articular injection, mean BPS score assessed at day 1, 2, 3, 7, 14, 21 and 6th week indicated that difference of BPS score between the 2 groups was found to be statistically insignificant with P value of 1, 0.60, 0.41, 1, 0.5, 0.32, 0.28 respectively ($p > 0.05$).

In our study baseline SPS score in group D was 4.06 ± 0.58 and in group T was 5.13 ± 0.57 . After giving intra-articular injection, difference of SPS score between the 2 groups was found to be statistically insignificant on days 1, 2, 3, 7, 14 and 6th week with P value of 0.39, 0.79, 0.79, 0.17, 0.051, 0.17 respectively ($p > 0.05$),

while it was found to be significant on day 21 with p value 0.026.

In our study baseline New Oxford Knee score in group D was 25.26 ± 5.75 and in group T was 21.7 ± 2.99 . After giving intra-articular injection, mean New Oxford Knee score in group D was 37.36 ± 3.13 while in group T was 34.43 ± 5.98 which indicates that difference of New Oxford Knee score between the 2 groups was found to be statistically significant with P value of 0.02 ($p > 0.05$) which denotes that subjects receiving methylprednisolone responded better than those receiving triamcinolone.

We could not find any study that compared the BPS, SPS and New Oxford Knee Score on patients with osteoarthritis of knee joint receiving intra articular injections.

In our study, the Knee Injury And Osteoarthritis Outcome Score was used in which multiple set of questionnaire were asked to study subjects before and after receiving intra articular injection regarding 6 subscales: pain, stiffness, other symptoms, function in daily living, quality of life, function in sports and recreational activity. The subjective response given by the patients was given a score from 0 to 4.

On applying paired t test, it was found that there was statistically significant improvement in the patient's response to pain, other symptoms, function in daily living, quality of life, function in sports and recreational activity after intra articular injection of both the drugs.

Conclusion

It was concluded that intra-articular injection of Inj. Methylprednisolone and inj. Triamcinolone is equally effective without any side effects with Regular physiotherapy for Osteoarthritis Knee.

Further prospective studies can be done to support the more evidence based practice.

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