

## Original Research Article

# Is intra articular injection of triamcinolone acetonide a better option in management for primary osteoarthritis knee than methylprednisolone acetate?

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### ABSTRACT

**Background:** Intra articular corticosteroid injections are commonly using in management of osteoarthritis of knee. Most commonly used ones are methylprednisolone acetate (MPA) and triamcinolone acetonide (TA). The aim of our study is to compare the efficacy of these two agents in treating osteoarthritis of knee and find out if any one agent is superior to other if so.

**Methods:** Selected patients with symptomatic OA knee with Kellgren-Lawrence grade III were given intra articular steroid injections (40 mg TA or 40 mg MPA) and were reassessed on day 0, 1 month, 3 months and 6 months. VAS and Knee society scores were calculated using questionnaire method and compared the scores.

**Results:** The VAS and KSS was improved significantly on day 0, 1 month and 6th month and it was found to be increased at 6th month in both the groups and the values were comparable in both the groups. The effect of both the agents last for 3-6 months and the effects found to be maximum at 1st month and the effects starts to wean off at the end of 6 months in both the groups.

**Conclusions:** Both methylprednisolone acetate (MPA) and triamcinolone acetonide (TA) are equally effective in reducing pain in patients with osteoarthritis of knee and thereby improving their functional ability upto 6 months.

**Keywords:** Osteoarthritis, Knee, Injection, Intra-articular, Corticosteroid, Methylprednisolone acetate, Triamcinolone acetonide

### INTRODUCTION

Osteoarthritis has become the most common cause of chronic joint pain in the world.<sup>1</sup> Osteoarthritis is a degenerative joint disorder, which affects the cartilage causing joint pain, swelling, stiffness and disability.<sup>2</sup> It has got multifactorial etiologies like age, genetic susceptibility, obesity, trauma, mal-alignment.<sup>3</sup> The prevalence of symptomatic osteoarthritis knee among the adults aged more than 60 years is approximately 10% and 13% for male and female respectively.<sup>4,5</sup> Osteoarthritis of knee causes significant morbidity and leading to pain and

disability in more than 3.6% of global population, and its management is becoming a significant healthcare challenge, since the knee pain is associated with a generous and relentless decrease in physical activity in older adults in their community living, it is a strong predictor of disability and dependency in future.<sup>6</sup> So effective preventive measures and early treatment helps in healthy ageing in population.<sup>7</sup> Now due to the proven efficacy and minimal adverse effect intra-articular steroids become the cornerstone for conservative treatment for osteoarthritis of knee.<sup>8,9</sup> The most commonly used preparations are methylprednisolone

acetate (MPA) and triamcinolone acetonide (TA). So we are framing a study comparing the effectiveness of these two drugs, which are available in India and to find out which one is better in pain management of osteoarthritis of knee.

## METHODS

Our study is a prospective study done at Department of Orthopedics, Sri Ramachandra Institute of Higher Education and Research, Chennai, India, during November 2017 to November 2018. This was done in accordance with the code of ethics of the world medical association for experiments involving humans (Declaration of Helsinki). Institutional ethics committee approval was obtained. The inclusion criteria are patients age more than 55 years having knee pain for more than 2 years with radiological grading of Kellgren-Lawrence Grade III and failed conservative management in the form of physiotherapy, life style modification, analgesics. Patients who already got intra articular steroid injection, active infection, patients with secondary osteoarthritis, chronic liver disease and chronic kidney disease were excluded from our study.

We had totally 60 patients who took part in the study. Informed written consent was obtained from all patients. Demographic and clinical data of the patients (age, sex, duration of disease, weight, height, most affected knee, Kellgren-Lawrence radiographic evidence) were collected at first visit. We also noted the current use of analgesics, NSAIDs, opioids, chondroprotective agents. These drugs were made to remain stable during the

course of study and no new pharmacological or non-pharmacological intervention was added during the course. They were divided into two groups using card method. First group (30 patients) was given intra-articular Methyl prednisolone acetate injection and second group (30 patients) was given intra articular triamcinolone acetonide injection. For all patients injection was given through lateral suprapatellar approach with 1cc xylocaine followed by 40 mg TA or 40 mg MPA. Patients were evaluated for pain relief by VAS and clinical and functional outcome by Knee society score. All the patients were informed to come for follow up at our outpatient department at day 0, 1month, 3 months and 6 months.

## RESULTS

For the study we enrolled 60 patients more than 55 years of age, 6 of them refused to be the part of study as they were not able to show up for follow up. So we conducted the study in the rest 54 patients (27 patients each in TA and MPA group). There were 2 lost follow up in TA group and 1 in MPA group. The mean age for group I (MPA group) was 58.54 and for group II (TA group) was 59.01 and male to female ratio was 11:15 and 10:15 for group I and group II respectively. The visual analogue score and Knee society score for both clinical and functional components were tabulated in table 1 and 2. We had no case of any adverse drug reaction and other complications following intraarticular injection. Only one case from both groups had hypopigmentation of injection site which gradually disappeared and became normally at 6th month review.

**Table 1: VAS score and KSS of group I patients (methylprednisolone acetate).**

	Pre Injection	0 day	1 month	3 months	6 months
<b>VAS</b>	7.1	3.2	4	4.4	7.1
<b>Knee society score</b>					
Clinical	55	75	71	65	60
Functional	66	67	67	66	64.5

**Table 2: VAS and KSS of group II patients (triamcinolone acetate).**

	Pre injection	0 day	1 month	3 months	6 months
<b>VAS</b>	7.2	3.1	3.9	4.7	7.2
<b>Knee society score</b>					
Clinical	57	74	72	64	59
Functional	66	67	62	63	63.5

## DISCUSSION

There are various treatment options available for symptomatic relief of osteoarthritis knee. Non-pharmacological and preventive strategies include patient education, weight reduction and physiotherapy and exercise. Pharmacological therapy includes simple analgesia (paracetamol and NSAIDs), topical therapy (short term topical NSAIDs), glucosamine and

chondroitin, Intra-articular therapy (corticosteroids, hyaluronic acid), opioid analgesia (tramadol, codeine, morphine, oxycodone).<sup>10</sup> Even though the pharmacological drugs has got many side effects and exposing the major body system to dreadful conditions, intra-articular corticosteroid injections are routinely used and recommended by American college of rheumatology for conservative treatment of osteoarthritis knee.<sup>11</sup> Many studies were conducted in finding clinical advantages of

intra-articular corticosteroid injection, some showed faster progression of cartilage damage and some saying it can decrease the rate of damage.<sup>12-16</sup> Now due to the proven efficacy and minimal adverse effect intra-articular steroids become the cornerstone for conservative treatment for osteoarthritis of knee.<sup>1,18</sup> Accessible study suggested that among the most commonly used preparations for chronic inflammatory arthritis, triamcinolone hexacetonide (TH) has better efficacy than methylprednisolone acetate (MPA) and triamcinolone acetonide (TA).<sup>19,20</sup>

In our study we observed that there was significant amount of improvement in pain after intra articular injection in both Methylprednisolone acetate and triamcinolone acetonide group. In methylprednisolone acetate group the VAS was reduced to a mean of 3.2, 4.4 from the base line of 7.1 at day 0, 1st month and 3rd month respectively and the value increased to preinjection values at the end of 6<sup>th</sup> month. Similarly in triamcinolone acetonide group the VAS was reduced to a mean of 3.1, 3.9, 4.7 from the base line of 7.2 at day 0, 1st month and 3rd month respectively and the value increased to preinjection values at the end of 6<sup>th</sup> month. Though there was only minimal improvement in knee society functional score; there was significant improvement in the knee society clinical score in both the groups. The knee society clinical score of triamcinolone acetonide group improved to a mean of 75, 71, 65 and 60 from the baseline score of 55 on day 0, 1<sup>st</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month respectively. Similarly the knee society clinical score of methylprednisolone acetate group improved to a mean of 74, 72, 64 and 59 from the baseline score of 57 on day 0, 1<sup>st</sup> month, 3<sup>rd</sup> months and 6<sup>th</sup> month respectively. There was no significant difference noted between both the groups, as both the values were comparable for VAS and KSS.

In our study both the agents were able to produce a good amount of pain relief and clinical improvement and the effect last for 3-6 months. The outcome seems to be comparable in both the groups and in both the groups the effect seems to wean off at the end of 6 months. There was significant improvement in KSS clinical score in pain and range of motion during this period in both the groups. Also we couldn't find any superiority of one agent over the other during the follow up as the results fall in similar pattern for both the groups.

In a study conducted by Pyne et al on comparing intra articular injection of triamcinolone hexacetonide (THA) and methylprednisolone acetate (MPA) at knee showed similar results.<sup>21</sup> In this study there was significant improvement of at 3 weeks in both the groups and only MPA maintained the effect at the end of 8<sup>th</sup> week. This difference may be observed because in their study the duration of symptoms and effusion grade was more for THA group. In another similar study conducted by Shikhar et al on comparing intra - articular Injections of Methyl Prednisolone and Triamcinolone in Osteoarthritis

of Knee there was no significant difference in both the groups at end of 8 and 12 weeks but there was difference suggestive of better pain relief in methyl prednisolone group at 4<sup>th</sup> week than triamcinolone group.<sup>22</sup> In another study done by Piyush et al where methyl prednisolone showed better pain relief at 8 weeks compared to Triamcinolone group, but at 4<sup>th</sup> and 8<sup>th</sup> week there was no significant difference in was observed.<sup>23</sup> In another study done by Buyuk et al on efficacy of intra articular methyl prednisolone and triamcinolone on knee it was found that both have similar efficacy and highest efficacy is observed at 2 weeks and effect continues for 24 weeks after injection.<sup>24</sup>

Even though there are some variation in results in different studies regarding the efficacy of both the agents our study came out with the strong evidence that intra articular injections of both methylprednisolone acetate (MPA) and triamcinolone acetonide (TA) were equally effective in relieving the knee pain in osteoarthritis knee and provides functional improvement for a better community life in patients with osteoarthritis of knee, where the analgesics or NSAIDs failed to do so in such patients.

#### **Limitations**

No control group was there and sample size is small.

#### **CONCLUSION**

In our study we didn't found any difference in outcome among the most commonly used agents for intra articular injections (TA and MPA). Both of them have similar outcome and both do have good effect in terms of pain relief on VAS and KSS clinical score up to 6 months. So both the agents provide a significant amount of pain relief in patients with osteoarthritis knee for a short-term of about 6 months and both have comparable efficacy and none found better than the other.

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