

Efficacy of Intra-Articular Steroid Injection in Osteoarthritis Patients

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Abstract

Introduction: Osteoarthritis (OA) is a clinical syndrome of joint pain accompanied by varying degrees of functional limitation and reduced quality of life due to chronic degenerative arthropathy. It is most common form of arthritis and one of the leading causes of pain and disability worldwide in population above 50 years.

Material and Methods: 162 patients of symptomatic osteoarthritis were given intra articular triamcinolone acetonide injections over a period of 5 years at SKIMS Soura Srinagar J&K.

Results: Among the patients 107 (66%) were females and 55 (34%) were males. Knee joint was most common involved joint. 15 patients had to receive repeated intraarticular steroid injection.

Conclusion: Intra articular triamcinolone injection revealed good efficacy for pain relief and functional outcome without adverse effects.

Keywords: Osteoarthritis; Cartilage; Joint inflammation

Abbreviations: OA: Osteoarthritis; IA: Intraarticular; NSAIDs: Non Steroid Anti Inflammatory Drugs

Introduction

Osteoarthritis (OA) refers to a clinical syndrome of joint pain accompanied by varying degrees of functional limitation and reduced quality of life due to chronic degenerative arthropathy. It is by far the most common form of arthritis and one of the leading causes of pain and disability worldwide. Osteoarthritis involves all joint tissues (cartilage, bone, synovium/capsule, ligaments and muscle). Key pathological changes include localised loss of articular (hyaline) cartilage and remodelling of adjacent bone with new bone formation (osteophyte) at the joint margins [1]. Obesity, family history of OA, high body mass Index (BMI) and repeated trauma are the susceptible precipitating factors to develop Osteoarthritis [2]. OA currently affects more than 27 million Americans, up from 21 million in 1990. By the year 2030, it is expected that more than 67 million Americans will have arthritis [3]. Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used in patients with joint inflammation owing to their lower toxicity compared with corticosteroid-based drugs. However, some patients are allergic or resistant to the effects of NSAIDs. Ultimately, anti-inflammatory drugs such as synthetic glucocorticoids (GCs) are employed by intra-articular injection into affected joints [4]. These drugs, in complex with their glucocorticoid receptor (GC-receptor), act as transcription factors that inhibit expression of pro inflammatory proteins by interfering with the activity of the transcription factor nuclear factor kappa B, or enhancing expression of anti-inflammatory proteins directly [5]. Triamcinolone acetonide (TA) is a GC drug used commonly for joint injection in OA patient owing to its extended duration of effect [6]. Results from several studies have

shown contradictory results regarding the benefits versus toxic effects of TA and or other drugs of the same class. Concerning the protective effects, a study in patients with Osteoarthritis was taken.

Material and Methods

This was an observational study of 162 patients with symptomatic osteoarthritis diagnosed by rheumatologists of SKIMS or an orthopedic surgeon not responding to conservative management who presented during the period of study and gave consent for Triamcinolone Acetonide injections. Patients above 45 years of age with symptomatic osteoarthritis according to American College of Rheumatology and radiographic evidence of osteoarthritis were considered. The exclusion criteria included patients with secondary osteoarthritis, severe axis deviations of knee; Varus/valgus deformity of knee >15°, coagulation or platelet disorders, symptomatic osteoarthritis of either hip, neoplasms, joint prosthesis of lower limbs, recent trauma or open surgery within past 12 months or intra-articular injection of corticosteroid in any joint within 3 months before screening. The study was conducted in Rheumatology division of Internal Medicine Department at Sheri-Kashmir Institute of Medical Sciences (SKIMS), Soura Srinagar Jammu and Kashmir India over a period of about two years between 2015 to June 2017.

After selecting the cases on the basis of the above mentioned criteria, they were subsequently administered injections of Triamcinolone Acetonide in the respective joints with standard aseptic techniques under sterile conditions. Descriptive and inferential statistical analysis was carried out in this study.

Results

Results were mentioned below in the Tables 1-4.

Gender	Frequency	Percentage
Male	55	34
Female	107	66
Total	162	100

Table 1: Shows gender distribution of study patients.

Site of intra-articular steroid	Frequency	Percentage
Bilateral Knee	41	25.3
Left Knee	55	34
Right Knee	48	29.6
Right Ankle	7	4.3
Left Ankle	4	2.5
Right Wrist	2	1.2
Left Wrist	1	0.6
Bilateral Shoulder	1	0.6
Right Shoulder	1	0.6
Left Shoulder	1	0.6
Right Elbow	1	0.6

Table 2: Shows site of intra articular injection among study patients. Out of 162 patients 25.3% patients received injection in Bilateral Knee, 34.0% patients in left knee, 29.6% patients in right knee, 4.3% in right ankle, 2.5 % in left ankle, 1.2% in right wrist, 0.6% in left wrist, 0.6% in bilateral shoulder, 0.6% in right shoulder, 0.6% in left shoulder and 0.6% patients received steroid injection in right elbow.

Site of intraarticular steroid	Male [n=55]		Female [n=117]	
	No.	%age	No.	%age
Bilateral Knee	13	23.6	28	26.2
Left Knee	20	36.4	35	32.7
Right Knee	19	34.5	39	36.4
Right Ankle	2	3.6	5	4.7
Left Ankle	0	0	4	3.7
Right Wrist	0	0	2	1.9
Left Wrist	0	0	1	0.9
Bilateral Shoulder	0	0	1	0.9
Right Shoulder	0	0	1	0.9
Left Shoulder	1	1.8	0	0
Right Elbow	0	0	1	0.9

Table 3: Shows gender wise distribution of intra articular steroid injections in relation to site of joints injected. Out of 55 males, 23.6%

males received injection in bilateral knee, 36.4% in left knee, 34.5% in right knee, 3.6% in right ankle, 1.8% in left shoulder. No male received injection in left ankle, right wrist, left wrist, bilateral shoulder, right shoulder and right elbow. Out of 107 female patients 26.2% received bilateral knee intraarticular steroid injection, 32.7% left knee injection, 36.4% right knee injection, 4.7% right ankle, 0.7% left ankle, 1.9% right wrist, 0.9% left wrist, 0.9% bilateral shoulder, 0.9% right shoulder and 0.9% received right elbow injections. No female received left shoulder injection.

Duration	Frequency	Percentage
< 1 Month	3	20
1 -3 Months	5	33.3
3-6 Months	4	26.7
> 6 Months	3	20
Total	15	100
Mean ± SD=5.4 ± 6.25		

Table 4: Shows frequency and duration between repetitive steroid injections in study patients. 15 patients were given multiple intra articular steroids in same joint. In 20% patient's injection was repeated in less than a month, in 33.3% patients injection repeated between 1-3 months, in 26.7% patients injection repeated between 3-6 months and in 20 % patients intraarticular injection was repeated after 6 months.

Discussion

To circumvent the possible side effects of selective and nonselective NSAIDS, physicians are increasingly considering intra-articular treatment when simple measures are inadequate.

Steroid injections may be given up to three or four times per year.

Our study demonstrated that OA patients who received IA injections of Triamcinolone acetonide had significant improvements in pain and stiffness during the repeated Triamcinolone injection regimen. Osteoarthritis is a slowly evolving articular disease characterized by a gradual development of joint pain, stiffness, and loss of full range of motion. Degeneration of cartilage is among the most prominent pathologic changes. OA is a complex interaction of degradation and repair of the cartilage, bone, and synovium with secondary components of inflammation [7]. Chondrocytes from OA patients have been demonstrated to be deficient in glucocorticoid receptors [8]. The resulting decreased responsiveness of OA cells to circulating glucocorticoid may be among the factors that lead to an increased level of cytokine and metalloprotease synthesis in degrading cartilage [9]. It is therefore logical to consider interventions that could control inflammation in OA patients. The anti-inflammatory effects of synthetic glucocorticoids serve as a basis for such a therapeutic approach. Although these steroids are administered chiefly for relief of symptoms, there is some evidence in experimental animal models of OA to suggest that they also exert protective effects, in that they may reduce the severity of cartilage lesions and the size of osteophytes [10-12]. These effects are presumably the result of the suppressive action of glucocorticoidson the synthesis by connective tissue cells of a number of the cytokines and metalloproteases associated with cartilage degradation. Physicians have treated patients with IA injections of corticosteroids for more than 4 decades. Despite extensive clinical

experience, certain aspects of local corticosteroid treatment remain controversial, such as its relative efficacy, its possible deleterious effects, and its potential chondroprotective properties. One retrospective observational study conducted by Balch HW et al. evaluated IA steroid injections that were repeated over a period of 4–15 years in 65 patients. Based on findings from radiologic assessments, they concluded that, if used judiciously, IA corticosteroid therapy plays an important role in the management of chronic arthritis. They found no real evidence to support the suggestion that repeated IA injections inevitably led to rapid destruction of the injected joint [13].

The study conducted by Dieppe et al. revealed that IA steroid causes a significant reduction though transient pain and tenderness than placebo [11] valtonen EJ in a RCT single blind study over 6 months showed that IA steroid may give a long term benefit of OA symptoms.

In our study a total of 162 patients received intra articular steroid injections (Triamcinolone Acetonide) over a period of two years (Table 1). Our study confirms observations made in previous short-term studies in which a strong trend towards greater clinical improvement in the IA steroid group was shown, this being significant for key variables such as pain and stiffness. We found in our study that females are mostly affected by Osteoarthritis constituting about 66% of patients (Table 1) Knee joint was the mostly affected joint in both male and female patients. We also found that in only 15 patients, intra articular steroid injection was repeated showing good efficacy and effectiveness of intra-articular Triamcinolone Acetonide injection in Osteoarthritis Patients as far as pain and stiffness is concerned (Table 4). None of the patients reported any subcutaneous atrophy or extensor tendon rupture. In this study none of the patients who received intra articular steroid injection developed septic arthritis. There is no clear cut evidence in literature that intra-articular steroid causes osteoporosis, however same needs to be re-looked.

Conclusion

This study shows the benefits of intraarticular injection of Triamcinolone Acetonide for the treatment of osteoarthritis which provides good efficacy for pain relief and improved functional outcome. Thus, based on the results obtained, intra articular injections of Triamcinolone Acetonide are an important available conservative treatment option for early Osteoarthritis. We have not found any osteopenia on conventional radiography in treated patients; however same needs to be confirmed by bone DEXA scan.

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