World Journal of Current Medical and Pharmaceutical Research
Content available at www.wjcmpr.com ISSN: 2582-0222

A PROSPECTIVE OBSERVATIONAL STUDY TO EVALUATE SAFETY AND EFFICACY OF INTRAARTICULAR ADMINISTRATION OF TRIAMCINOLONE ACETONIDEIN KNEE OSTEOARTHRITIS IN A TERTIARY CARE HOSPITAL

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Article History

Received on: 15-03-2024
Revised on: 19-04-2024
Accepted on: 03-05-2024

Abstract

Objective: Osteoarthritis is a chronic disease marked by cartilage deterioration, affecting millions globally. Although incurable, it can be managed with adjuvant therapy. This study aims to assess the safety and efficacy of intra-articular Triamcinolone acetonide in knee OA, a corticosteroid used for OA, Rheumatoid arthritis, gouty arthritis, and skin disorders.

Methods: In a prospective observational study with 120 participants, pain severity was evaluated using numerical pain rating and KL-grade scales, while joint space narrowing was assessed via X-ray reports. Subjects were categorized by severity and prescribed intra-articular Triamcinolone acetonide, analgesics, NSAIDs, PPIs, and supplements. They were monitored for pain reduction.

Results: Pain scores were evaluated using NPRS and KL-grade scale: initially, severe pain affected 4.1% (n=5), moderate 86.6% (n=104), mild 9.1% (n=11). After three follow-ups over 6 months, severe pain decreased to 1.6% (n=2), moderate to 84.1% (n=101), and mild increased to 14.1% (n=17).

Conclusion: Our study concludes that intra-articular triamcinolone acetonide, combined with oral and topical analgesics, PPIs, nutritional, and vitamin supplements, is safer and more effective for knee OA, improving patient quality of life, reducing disease severity, prescription charges, and adverse drug reactions.

Keywords: Osteoarthritis, Intra Articular, Triamcinolone acetonide, Numerical pain rating scale, Kellgren Lawrence grade scale.

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DOI: https://doi.org/10.37022/wjcmpr.v6i2.324

Introduction

Osteoarthritis (OA), according to the World Health Organization (WHO), is a chronic joint disorder characterized by the degeneration of joint cartilage [1]. Globally, OA affects over 300 million, with prevalence increasing with age and varying by gender; in India, approximately 40% of individuals over 70 have OA, with higher rates in women and increasing prevalence between ages 30 and 65. OA, influenced by age, genetics, trauma, obesity, and inflammation, with secondary factors including injury, overuse, congenital abnormalities, metabolic disorders, infection, and hormonal imbalances. It manifests in various types including primary, secondary, localized, generalized, erosive, inflammatory, and post-traumatic forms, each impacting joint health differently [2-3]. Clinical features comprise joint pain, stiffness, swelling, reduced range of motion, and radiological findings such as joint space narrowing and osteophyte formation. Complications include chronic pain, joint deformity, reduced function, and secondary health issues like cardiovascular diseases and diabetes. Investigations involve medical history, physical exams, imaging (X-rays, MRI), laboratory tests, and functional assessments for diagnosis and management [4-5].

Drug profile of Triamcinolone Acetonide:

Brand Names: Stancort, Aristocort, Kenalog, Nasacort, Oracort.
Generic Name: Triamcinolone Acetonide [6].
Dosage Forms: Oral (tablets/capsules), Topical (cream/ointment), Oral or intranasal topical (spray), Intramuscular, Intravitreal injection.

Strengths Available: Injectable suspension: 5mg, 10mg, 20mg, 40mg/mL.Topical cream/ointment: 0.025%, 0.1%, 0.5%. Dental paste: 0.1%.

Drug Class: Glucocorticoid (Corticosteroid).

Indications: Various skin conditions, rheumatoid arthritis, gouty arthritis, osteoarthritis, allergic rhinitis, uveitis, alopecia areata, neurodermatitis, and more.

Composition: Each mL contains 10mg triamcinolone acetonide, with sodium chloride, benzyl alcohol, carboxymethylcellulose sodium, and polysorbate 80.

Dosage: Varied dosages for different conditions, routes, and age groups.

Pharmacokinetics: Absorption, distribution, metabolism, protein binding, route of elimination, and clearance vary with administration route [7].

Pharmacodynamics: Anti-inflammatory effects via inhibition of phospholipase A2, reduction of leukocyte migration, and inhibition of pro-inflammatory signals.

Contraindications: Epidural use, fungal/viral infections, tuberculosis, diabetes, psychosis, glaucoma, pregnancy (<2 years).

Drug Interactions: Various interactions with aminoglutethimide, amphotericin B, antibiotics, anticoagulants, NSAIDs, cyclosporine, etc.

Monitoring Parameters: Symptom relief, adverse effects, liver/kidney function, cardiac function.

Toxicity: Neuropsychiatric symptoms, cardiovascular effects, reversible upon discontinuation.

Adverse Reactions: Itchiness, burning, headaches, dizziness, edema, Cushing syndrome, hypertension, weight gain, osteoporosis, adrenal insufficiency.

Storage: Store at room temperature (68-77°F) in a cool, dry area [7].

Patient Counselling: Monitor intraocular pressure, seek immediate care for eye symptoms, check for drug interactions, ensure cleanliness before injection, follow prescribed treatments for osteoarthritis [8].

Methodology

The methodology section describes in detail all the materials that have been used to conduct a study as well as the procedures that are under taken.

Study design: A hospital-based Prospective Observational Study.

Study site: This study was conducted at Susmitha Ortho & Trauma care hospital, Narasaraopet**.**

Study period: The study is proposed to conduct in a period of 6 months.

Sample size: A total of 120 subjects who were already diagnosed with osteoarthritis and on regular checkups were included in the study. Those who fulfilled the exclusion and inclusion criteria were selected for the study.

Study criteria: The study will be carried out by considering the following criteria:

Inclusion Criteria:

- Patients found to be suffering from knee osteoarthritis were included.
- Consider the people from age of >45yrs.
- Consider both male and female who are affected with knee osteoarthritis.
- Patients who are suffering from symptomatic knee OA for >/6 months.
- Based on Kellgren – Lawrence grade 2-3.
- Based on pain severity rating scale ranges from mild to moderate.[9]

Exclusion Criteria

- People below 45 years are excluded.
- People with history of infection in the index-knee joint; active knee infection are excluded.
- People with other illness like Diabetes mellitus, coronary artery disease
- (CAD), nephrology disorders, reactive arthritis, rheumatoid arthritis, malignancy are excluded.
- People who are not willing to give consent and who are not interested to involve in the study are excluded.
- People with severe knee pain are excluded.

Results and Discussion

The information provides the summary of all the results that are characterized based on various parameters.

Distribution of subjects based on Age of Knee Osteoarthritis

Age wise distribution of knee osteoarthritis among subjects are shown in table 01. Individuals of the age group 55-64 years had the highest incidence of knee Osteoarthritis (n = 46). Followed by age group 45-54 years (n = 42), 65-74 years (n = 27), 75-84 years (n = 3). While the age group 85-94 years had the lowest incidence of knee Osteoarthritis (n = 2).[10]

Distribution of subjects based on Gender of Knee Osteoarthritis

Gender wise distribution of knee Osteoarthritis among subjects are shown in table 02. Among 120 subjects, 73 were female and 47 were male.

Distribution of female subjects based on Menopause Status

Distribution of knee Osteoarthritis among female subjects in menopause status areshown in table 03. Among 73 female subjects, 60 were in menopause stage and 13were not reached menopause stage.

Distribution of subjects based on Obesity

Distribution of knee Osteoarthritis among subjects with obese and non-obese are shown in table 04. Among 120 subjects, 72 were obese and 48 were Non-obese.

Distribution of subjects based on Occupation.

Distribution of knee Osteoarthritis among subjects with various occupations are shown in table 05. Among the total subjects farmers are mostly affected (n = 61) followed by housewives (n = 35), labour workers (n=20) and attender (n = 2). Others like milk man (n=1) and teacher (n = 1) are least affected.

Distribution of subjects based on KL-Grade Scale

Distribution of knee Osteoarthritis among subjects with KL-Grade scale score are shown in table 06.Among them mild were 9.1 % (n =11), moderate were 86.6 % (n = 104), severe were 4.1 % (n = 5).

Distribution of Subjects Based on Pain severity on First Visit

Table 07 shows distribution of subjects based on severity of

pain on first visit to hospital. Among them mild were 9.1 % (n = 11), moderate were 86.6 % (n = 104), severe were 4.1 % (n = 5).

Distribution of Subjects Based on Pain severity on Follow up 01

Table 08 shows distribution based on pain severity of subjects in follow up 01. Among them mild were 95 % (n = 114), moderate were 5% (n = 6), severe were 0 % (n = 0).

Distribution of Subjects Based on Pain severity on Follow up 02

Table 09 shows distribution based on pain severity of subjects in follow up 02. Among them mild were 61.6 % (n = 74), moderate were 38.3% (n = 46), severe were 0 % (n = 0).

Distribution of Subjects Based on Pain severity on Follow up 03

Table 10 shows distribution based on pain severity of subjects in follow up 03. Among them mild were 14.1% (n = 17), moderate were 84.1% (n = 101), severe were 1.6 % (n = 2).

Distribution Based on Pain Severity of Subjects in All Follow ups

Table 11 shows distribution based on pain severity of subjects in all follow-ups. Among them mild were 11 subjects on first day of visit, 114 on follow up 01, 74 on follow up 02 and 17 on follow up 03, moderate were 104 subjects on first day of visit, 6 on follow up 01, 46 on follow up 02, and 101 on follow up 03, severe were 5 subjects on first day of visit, 0 on follow up 01, 0 on follow up 02 and 2 on follow up 03.

Distribution Based on Pain Score of Subjects in All Follow ups

Table 12 shows distribution based on pain score of subjects in all follow ups. Among them most of the subjects had pain score of 7 (n = 33) followed by 6 (n = 29) and 5 (n = 24) on first day of visit. On follow up 01 highest number of subjects were found with pain score of 2 (n =63) followed by 1 (n = 33). On follow up 02 most of the subjects were with pain score of 3 (n = 47) followed by 4 (n = 31). On follow up 03 most of the subjects were with pain score of 6 (n=41) followed by 5 (n=31).

Distribution Based on Triamcinolone Acetonide Along With Adjuvant Therapy

Table 13 shows distribution of subjects based on Triamcinolone Acetonide along with adjuvant therapy for first 10 days. Triamcinolone Acetonide were prescribed for 120 subjects followed by Oral analgesics (n=96), Topical analgesics (n=72), Proton pump inhibitors (n=96), Nutritional supplements (n=84), Vitamin supplements (n=83).

Table1: Distribution of subjects based on Age of Knee Osteoarthritis

S.NO	Age group	No. of subjects(n=120)	Percentage
1.	45-54	42	35%
2.	55-64	46	38.3%
3.	65-74	27	22.5%
4.	75-84	3	2.5%
5.	85-94	2	1.6%

Table2: Distribution of subjects based on Gender of Knee Osteoarthritis

S.NO	Gender	No.of subjects (n=120)	Percentage (%)
1	Males	47	39.2
2	Females	73	60.8

Table 3: Distribution of female subjects based on Menopause Status

S.NO	Menopause status	No. of subjects(n=73)	Percentage
1	Yes	60	82.19%
2	No	13	17.80%

Table4: Distribution of subjects based on Obesity

S.NO	Obese/Non-obese	No. of subjects(n=120)	Percentage
1.	Obese	72	60%
2.	Non-obese	48	40%

Table 5: Distribution of subjects based on Occupation.

S.NO	Occupation	No. of subjects(n=120)	Percentage
1.	Farmer	61	50.8%
2.	House wives	35	29.1%
3.	Labour worker	20	16.6%
4.	Attender	2	1.6%
5.	Milk man	1	0.83%
6.	Teacher	1	0.83%

Table 6: Distribution of subjects based on KL-Grade Scale

S.NO	KL- Grade Scale	No. of subjects (n=120)	Percentage
1.	Mild	11	9.1%
2.	Moderate	104	86.6%
3.	Severe	5	4.1%

Table 7: Distribution of Subjects Based on Pain severity on First Visit

S.NO	On- first visit	No. of subjects(n=120)	Percentage
1.	Mild	11	9.1%
2.	Moderate	104	86.6%
3.	Severe	5	4.1%

Table 08: Distribution of Subjects Based on Pain severity on Follow up 01

S.NO	Follow up 1	No. of subjects(n=120)	Percentage
1.	Mild	114	95 %
2.	Moderate	6	5 %
3.	Severe	-	0%

Table 09: Distribution of Subjects Based on Pain severity on Follow up 02

S.NO	Follow up 2	No. of subjects(n=120)	Percentage
1.	Mild	74	61.6 %
2.	Moderate	46	38.3 %
3.	Severe	0	0 %

Table 10: Distribution of Subjects Based on Pain severity on Follow up 03

S.NO	Follow up 3	No. of subjects(n=120)	Percentage
1.	Mild	17	14.1 %
2.	Moderate	101	84.1 %

Table 11: Distribution Based on Pain Severity of Subjects in All Follow ups

S.NO	Pain severity	On first visit(n=120)	Follow up 1(n=120)	Follow up 2(n=120)	Follow up 3(n=120)
1.	Mild	11	114	74	17
2.	Moderate	104	6	46	101
3.	Severe	5	0	0	2

Table 12: Distribution Based on Pain Score of Subjects in All Follow ups

Pain score	On visit (n=120)	Follow up 01 (n=120)	Follow up 02 (n=120)	Follow up 03 (n=120)
1	0	33	10	0
2	3	63	17	3
3	8	17	47	15
4	18	6	31	25
5	24	1	14	31
6	29	0	1	41
7	33	0	0	4
8	5	0	0	1

Table 13: Distribution Based on Triamcinolone Acetonide Along with Adjuvant Therapy

Drugs prescribed to subjects	No. of subjects (n=120)	Percentage
Triamcinolone Acetonide	120	100%
Oral analgesics	96	80%
Topical analgesics	72	60%
Proton pump inhibitors	96	80%
Nutritional supplements	84	70%
Vitamin supplements	83	69.1%

Conclusion

In our study, IA Triamcinolone acetonide proves safer and more effective for knee Osteoarthritis, enhancing patient quality of life and cutting prescription costs. Its biannual dosage minimizes adverse drug reactions and eliminates daily dosing concerns. A single injection lasts 6 months, alleviating pain even in severe OA stages. We enrolled 120 participants, adhering to strict inclusion and exclusion criteria. All received IA Triamcinolone acetonide alongside oral and topical analgesics, PPIs, NSIADs, and supplements. We assessed pain reduction using NPRS and KL-grade scale across three-month follow-ups. Initial evaluations included X-ray analysis for joint conditions. Results indicate IA Triamcinolone acetonide's efficacy in OA treatment, shortening treatment duration and promoting joint health and pain relief.

Acknowledgements
The management and staff of the Narasaraopeta Institute of Pharmaceutical Sciences India are gratefully acknowledged by the authors for the facilities provided and ongoing support for the completion of the current study.

Funding
No Funding

Author Contribution
All authors are contributed equally.

Inform Consent
Inform consent taken from the patients.

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