

Research Article**A Comparative Study of Subjective Outcome of Oral versus Topical Combination of Glucosamine Sulphate and Diacerein in Patients of Grade 2 Osteoarthritis****Avishkar Patil****Assistant Professor, Department of Orthopedics, Dr. D.Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth, Nerul, Navi Mumbai, Maharashtra, India****Abstract**

Osteoarthritis (OA) is a chronic degenerative joint disease commonly affecting weight-bearing joints, with knee OA being the most prevalent. Treatment strategies for OA focus on alleviating pain and improving joint function. This study compares the subjective outcomes of oral versus topical combination therapy with glucosamine sulfate and diacerein in patients with grade 2 knee osteoarthritis (OA). A total of 120 patients diagnosed with grade 2 knee OA were enrolled and randomized into two groups: the oral therapy group and the topical therapy group. Both groups received a combination of glucosamine sulfate (1500 mg daily) and diacerein (50 mg daily), either orally or topically applied (as a gel) for 12 weeks. The primary outcome measure was the improvement in pain and functional disability as assessed by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score. Secondary outcomes included the assessment of quality of life, patient satisfaction, and adverse effects. Results indicated significant improvements in both groups with a higher reduction in pain scores and functional disability in the oral group compared to the topical group, although both therapies showed considerable benefit in improving the quality of life. No serious adverse effects were reported in either group. This study suggests that both oral and topical therapies of glucosamine sulfate and diacerein are effective in managing grade 2 knee OA, with oral therapy showing slightly better outcomes.

Keywords: Osteoarthritis, glucosamine sulfate, diacerein, oral therapy, topical therapy, WOMAC score, knee pain.

Introduction:

Osteoarthritis (OA) is a common condition that involves the progressive degeneration of articular cartilage, leading to pain, stiffness, and functional impairment, particularly in weight-bearing joints like the knee. OA affects a significant proportion of the aging population, with knee OA being one of the most prevalent forms (1-2). Clinical management of OA aims to alleviate pain, improve joint function, and slow disease progression. Pharmacological treatments for OA include nonsteroidal anti-inflammatory drugs (NSAIDs), analgesics, and disease-

modifying osteoarthritis drugs (DMOADs). Among the DMOADs, glucosamine sulfate and diacerein are commonly used as they have shown efficacy in providing symptomatic relief and improving joint function (3-4).

Glucosamine sulfate, a naturally occurring amino sugar, is believed to contribute to cartilage repair and reduce inflammation, whereas diacerein, an anthraquinone derivative, inhibits interleukin-1beta, a key pro-inflammatory mediator in OA. (5) Both agents have been independently studied for

their benefits in OA management. However, the combination of glucosamine sulfate and diacerein has shown promise in providing better results compared to monotherapy (6).

The route of administration (oral versus topical) may influence the efficacy and side-effect profile of these medications. Oral formulations, while offering systemic effects, may carry the risk of gastrointestinal side effects, while topical formulations offer the advantage of localized treatment with minimal systemic exposure. However, comparative studies on the subjective outcomes of oral versus topical combination therapy with glucosamine sulfate and diacerein are limited. This study aims to compare the subjective outcomes of these two forms of therapy in patients with grade 2 knee OA.

Aim:

To evaluate and compare the subjective outcomes (pain reduction, functional improvement, and quality of life) of oral versus topical combination therapy of glucosamine sulfate and diacerein in patients with grade 2 knee osteoarthritis.

Objectives:

1. To assess the effectiveness of oral versus topical glucosamine sulfate and diacerein combination therapy in improving pain and functional disability in patients with grade 2 knee osteoarthritis.
2. To compare the quality of life and patient satisfaction between the two groups.

Materials and Methods:

This was a study conducted at a tertiary care hospital over a period of 12 weeks. A total of 120 patients diagnosed with grade 2 knee osteoarthritis based on the Kellgren-Lawrence classification were included in the study. The inclusion criteria consisted of patients aged 40-75 years with a diagnosis of grade 2 OA, a WOMAC score ≥ 30 , and a symptom duration of at least 6 months. Patients with severe comorbidities (e.g., uncontrolled diabetes, cardiovascular diseases), those with contraindications to glucosamine or diacerein, and pregnant or lactating women were excluded.

The participants were randomly assigned to two groups:

1. **Oral Therapy Group:** Received glucosamine sulfate (1500 mg/day) and diacerein (50 mg/day) orally.
2. **Topical Therapy Group:** Received a topical gel containing glucosamine sulfate (1500 mg/day) and diacerein (50 mg/day) applied to the affected knee.

The primary outcome was the change in the WOMAC score, which assesses pain, stiffness, and functional disability. Secondary outcomes included patient satisfaction, quality of life (measured by the EQ-5D scale), and any adverse effects observed during the study.

Results:

Table 1: WOMAC Scores at Baseline and After 12 Weeks

Group	Baseline WOMAC Score	Post-Treatment WOMAC Score	p-value
Oral Therapy	38.5 \pm 7.2	15.4 \pm 6.0	<0.01
Topical Therapy	37.8 \pm 6.9	20.1 \pm 6.5	<0.01

Both groups showed significant improvement in WOMAC scores after 12 weeks of treatment, with the oral therapy group

showing a greater reduction in pain and functional disability.

Table 2: Quality of Life and Patient Satisfaction

Group	EQ-5D Score (Post-Treatment)	Patient Satisfaction (%)	Adverse Effects (%)
Oral Therapy	0.72 ± 0.12	85%	12%
Topical Therapy	0.68 ± 0.14	75%	10%

Both groups demonstrated an improvement in quality of life, with higher satisfaction in the oral therapy group. The adverse effects were mild and comparable in both groups, with the most common being mild gastrointestinal discomfort in the oral group.

Discussion:

Osteoarthritis is a debilitating disease that affects joint function and quality of life. While pharmacological management remains a cornerstone of treatment, glucosamine sulfate and diacerein have emerged as potential disease-modifying agents for OA. Previous studies have shown that both glucosamine sulfate and diacerein have individual benefits in reducing pain and improving joint function in OA patients (7-9).

This study aimed to compare the subjective outcomes of oral versus topical combination therapy with glucosamine sulfate and diacerein in patients with grade 2 knee OA. Our results indicate that both treatment modalities led to significant improvements in pain reduction, functional ability, and quality of life as measured by WOMAC and EQ-5D scores. However, the oral therapy group showed a slightly higher reduction in WOMAC scores and better overall patient satisfaction compared to the topical group. This suggests that oral therapy may have a more systemic effect, potentially providing better symptom relief in patients with moderate OA (9).

Both therapies were well-tolerated, with mild gastrointestinal discomfort being the most common adverse effect in the oral group. This is consistent with previous literature,

where glucosamine and diacerein are generally well-tolerated but may cause mild GI symptoms (10). The topical therapy group experienced fewer adverse effects, which may be attributed to the local administration of the medications.

Conclusion:

This study concludes that both oral and topical combination therapies of glucosamine sulfate and diacerein are effective in managing grade 2 knee osteoarthritis. The oral therapy showed slightly better outcomes in terms of pain reduction and patient satisfaction, although both treatment approaches significantly improved the quality of life of the patients. Given the mild side-effect profile of both therapies, topical treatment may be an attractive option for patients who are sensitive to oral medications.

References:

1. Gregori D, Giacobelli G, Minto C, Barbetta B, Gualtieri F, Azzolina D, Vaghi P, Rovati LC. Association of pharmacological treatments with long-term pain control in patients with knee osteoarthritis: a systematic review and meta-analysis. *Jama*. 2018 Dec 25;320(24):2564-79.
2. Majeed MH, Sherazi SA, Bacon D, Bajwa ZH. Pharmacological treatment of pain in osteoarthritis: a descriptive review. *Current rheumatology reports*. 2018 Dec;20:1-0.
3. Yusuf E. Pharmacologic and non-pharmacologic treatment of osteoarthritis. *Current Treatment Options in Rheumatology*. 2016 Jun;2:111-25.

4. de Andrade MA, de Oliveira Campos TV, de Abreu-E-Silva GM. Supplementary methods in the nonsurgical treatment of osteoarthritis. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*. 2015 Apr 1;31(4):785-92.
5. de Andrade MA, de Oliveira Campos TV, de Abreu-E-Silva GM. Supplementary methods in the nonsurgical treatment of osteoarthritis. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*. 2015 Apr 1;31(4):785-92.
6. Provenza JR, Shinjo SK, Silva JM, Peron CR, Rocha FA. Combined glucosamine and chondroitin sulfate, once or three times daily, provides clinically relevant analgesia in knee osteoarthritis. *Clinical rheumatology*. 2015 Aug;34:1455-62.
7. Teslim OA, Daniel AO, Nesto T, Adesola O. Comparative effects of a single treatment session using glucosamine sulphate and methyl salicylate on pain and hamstring flexibility of patients with knee osteoarthritis. *American Journal of Health Research*. 2014;2(5-1):40-4.
8. Pelletier JP, Yaron M, Haraoui B, Cohen P, Nahir MA, Choquette D, Wigler I, Rosner IA, Beaulieu AD. Efficacy and safety of diacerein in osteoarthritis of the knee: A double-blind, placebo-controlled trial. *Arthritis & Rheumatism: Official Journal of the American College of Rheumatology*. 2000 Oct;43(10):2339-48.
9. Brahmachari B, Chatterjee S, Ghosh A. Efficacy and safety of diacerein in early knee osteoarthritis: a randomized placebo-controlled trial. *Clinical rheumatology*. 2009 Oct;28:1193-8.
10. Pavelka K, Bruyere O, Cooper C, Kanis JA, Leeb BF, Maheu E, Martel-Pelletier J, Monfort J, Pelletier JP, Rizzoli R, Reginster JY. Diacerein: benefits, risks and place in the management of osteoarthritis. An opinion-based report from the ESCEO. *Drugs & aging*. 2016 Feb;33:75-85.