

**A comparative study to assess the safety and efficacy of etoricoxib versus aceclofenac in osteoarthritis****Harsimrat S. Waraich, Vikas Kumar\*, Ashok Goel, Jatinder Singh**

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**ABSTRACT**

**Background:** Osteoarthritis (OA) is most common form of arthritis; also referred as degenerative joint disease or “wear and tear” arthritis. Cyclooxygenase-2 (COX-2) inhibitors are effective for pain and inflammation in OA and gained importance over conventional non-steroidal anti-inflammatory agents (NSAIDs), as causes significantly less toxicity, particularly, in gastrointestinal tract. The objective of the present research was to study the short-term comparative clinical efficacy of aceclofenac and etoricoxib in patients with osteoarthritis and to compare the safety profile of the two drugs i.e. aceclofenac and etoricoxib.

**Methods:** The present study was a prospective, open label, parallel, intention to treat 80 patients out of 102 screened for osteoarthritis in the Department of Orthopaedics, Guru Nanak Dev Hospital attached to the Government Medical College, Amritsar. Patients were randomly divided in two groups with 40 patients each. Group A patients received Tab etoricoxib 60mg once daily and Group B patients received Tab. Aceclofenac 100mg twice daily. Patients were followed up after three weeks and at six weeks for clinical efficacy and safety.

**Results:** Both the groups found to have significant improvement in signs and symptoms of osteoarthritis. However, aceclofenac was superior to etoricoxib in terms of change in visual analogue scale score, osteoarthritic severity index, patients’ and physicians’ global assessment while, etoricoxib was superior in terms of WOMAC osteoarthritic index and safety parameters in terms of ADR.

**Conclusions:** Etoricoxib was better than conventional NSAIDs for the symptomatic management of osteoarthritis in terms of safety profile and clinical efficacy.

**Keywords:** Aceclofenac, Etoricoxib, Osteoarthritis, VAS, WOMAC**INTRODUCTION**

Osteoarthritis (OA) is most common form of arthritis; also referred as degenerative joint disease or “wear and tear” arthritis.<sup>1</sup> It is usually associated with aging and most likely affect the joints that are continually stressed throughout the years including knees, hips, fingers, and lower spine region. It is one of the ten most disabling disease in developed countries.<sup>2</sup> Almost 9.6% of men and 18.0% of women aged over 60 years, globally, have symptomatic osteoarthritis.<sup>2</sup> It affects about 4-6% of adult population and is mentioned one of the top five chronic disease in India.<sup>3</sup> The goal of osteoarthritis treatment is to reduce pain and improve function as there is no cure for

disease, but some treatment attempts to slow the disease progression.<sup>4</sup> Most often, the combination of therapies include physical measures, drug therapy and, sometimes, surgery.<sup>4</sup>

Pharmacotherapy for OA is focused mainly to alleviate pain, maintenance of quality of life and preservation of functional independence. At present, there is no pharmacological agents capable of retarding the progression or preventing OA.<sup>5</sup> Pharmacological agents for treatment of OA are, oral acetaminophen, oral and topical non-steroidal anti-inflammatory drugs (NSAIDs), oral selective cyclooxygenase-2 (COX-2) inhibitors,

opiates, topical capsaicin, intraarticular injections of steroids and hyaluronans.<sup>6</sup>

NSAIDs are mainstay for initial symptomatic treatment of OA. The mechanism by which NSAIDs exerts anti-inflammatory and analgesics effects is by inhibition of prostaglandin (PG) generating enzymes, cyclooxygenase (COX). In addition to inflammatory potential, PGs also contribute to important hemostatic functions such as, maintenance of gastric lining, renal blood flow and platelet aggregation. The conventional non-selective NSAIDs (ibuprofen, Naprosyn, indomethacin) by reducing the PG level in these organs can lead to side effects like gastric ulceration, renal insufficiency and prolonged bleeding time.<sup>7</sup> Therefore, efficacy and toxicity of NSAIDs results from their inhibition of COX, which primarily has two structurally and functionally distinct isoforms, COX-1 and COX-2. COX-1 is the constitutive isoform expressed throughout the body and has important role in gastrointestinal protection and platelet aggregation. Whereas COX-2 is inducible that is involved in inflammatory response.<sup>8</sup> The discovery of COX-2 led to development of therapeutic COX-2 inhibitors based on the hypothesis that they would afford efficacy similar to traditional NSAIDs and with better gastro-intestinal (GI) tolerability.<sup>7</sup>

Cyclooxygenase-2 (COX-2) inhibitors are effective for pain and inflammation in OA and gained importance over conventional non-steroidal anti-inflammatory agents (NSAIDs), as causes significantly less toxicity, particularly, in gastrointestinal tract.<sup>7</sup> The potential clinical benefit of selective COX-2 inhibitors are significant in management of chronic pain in OA.<sup>9</sup> COX-2 inhibitors initially approved were; celecoxib, rofecoxib, valdecoxib and its pro-drug parecoxib, etoricoxib and lumiracoxib. Most coxibs are either severely restricted in their use or withdrawn from the market in view of their adverse event profile.<sup>7</sup> A systematic review of randomized controlled trials on safety, efficacy and tolerability of COX-2 for treatment of OA has shown to be significantly improved GI safety and tolerability.<sup>10</sup>

The safety and efficacy of etoricoxib 30mg and celecoxib 200 mg in the treatment of osteoarthritis in two identically designed, randomized, placebo-controlled, non-inferiority studies had similar efficacy and both had similar safety in treatment of knee and hip OA versus placebo.<sup>11</sup> The long term efficacy and tolerability of etoricoxib over 52weeks during treatment of OA patients, in a double-blind, randomized, multicenter, active-comparator controlled trial; demonstrated maintenance significant clinical efficacy at dose ranging from 90-120mg.<sup>12</sup> The efficacy and safety of etoricoxib compared with naproxen in two, 138 weeks randomized studies of patient with osteoarthritis, was found to be clinically efficacious and well tolerable.<sup>13</sup> A randomized placebo-controlled trial, comparing the efficacy of etoricoxib 30 mg and ibuprofen 2400mg (800mg thrice daily), for 12weeks in the patients of OA, demonstrated superior efficacy of etoricoxib

versus placebo and comparable clinical efficacy versus ibuprofen.<sup>14</sup> In a randomized placebo-controlled trial, comparing the efficacy of etoricoxib, celecoxib, lumiracoxib, non-selective NSAIDs and acetaminophen for the treatment of OA, found that etoricoxib 30mg resulted in greatest improvement in pain and physical function.<sup>15</sup>

The present study was conducted to assess the safety and efficacy of etoricoxib versus aceclofenac (conventional Non-steroidal anti-inflammatory drug) especially in the north Indian population mainly in and around the city of Amritsar.

The objective of the present research was to study the short-term comparative clinical efficacy of aceclofenac and etoricoxib in patients with osteoarthritis and to compare the safety profile of the two drugs i.e. aceclofenac and etoricoxib.

## METHODS

The present study was a prospective, open label, parallel, intention to treat 80 patients of osteoarthritis visiting the OPD/Wards of the Department of Orthopaedics, Guru Nanak Dev Hospital attached to the Government Medical College, Amritsar. This study was conducted in accordance with the principles of good clinical practice and the Declaration of Helsinki.

### Inclusion criteria

- Patients with symptomatic osteoarthritis of age 35 to 60 years who fulfil American College of Rheumatology criterion for the diagnosis of osteoarthritis were enrolled
- Patients having symptomatic osteoarthritis either as a new case or as an old case following discontinuation of treatment with NSAIDs or other analgesic medications with a washout period of one week
- All these patients were examined as per the baseline criterion and were included in the study if they fit this criterion.

### Exclusion criteria

- Age less than 35 years or more than 60 years
- The patients who present with active concomitant gastroduodenal disorders, hepatic and renal impairment within last 30 days prior to receiving the study drug
- Patient with active cardiac lesion or a known hypertensive patient
- Pregnant females or those who were planning their pregnancy during the study
- Patients who had received oral, intramuscular, intraarticular or soft tissue injections of corticosteroids within last four weeks before receiving the first dose of the study medication

- Patients diagnosed to have any inflammatory arthritis, gout or acute trauma of the knee, hip or spine
- Patients with a known hypersensitivity to NSAIDs
- Patients with any known contraindication of the said drugs
- Female patients on oral contraceptive pills.

The approval from Institutional ethics committee, Government Medical College, Amritsar was obtained. Informed consent was sought from all the patients included in the present study.

Patients were randomly divided into 2 groups, A and B, consisting of 40 patients each. The duration of the study was six weeks. Group A patients received Tab Etoricoxib 30mg once daily and Group B patients received Tab. Aceclofenac 100mg. B.D. Patients were followed up after three weeks and at six weeks for clinical efficacy and safety.

Screening or baseline clinical assessment of osteoarthritis included patient’s assessment of arthritic pain on a Visual Analogue Scale (VAS), the osteoarthritis severity index, on a scale of 0-24 based upon the Western Ontario and Macmaster Universities (WOMAC) osteoarthritis index, patients and physician’s global assessment of osteoarthritis.

**Baseline investigations**

The investigation that were carried out were:

- X-ray of both the knees AP view and lateral view was taken to corroborate the diagnosis of osteoarthritis at day 0 and six weeks.

- Stool for occult blood was done at day 0, 21 and 42.
- ECG was done at day 0, 21 and 42.

**Statistical analysis**

The observations were tabulated in the form of mean±standard deviation and analysis was done using student’s “t” test and level of significance was determined as its ‘p’ value with p <0.05 taken as statistically significant.

**RESULTS**

A total of 102 patients were screened for the study from the O.P.D. of Department of Orthopaedics, Government Medical College, Amritsar.

Twelve patients did not meet the inclusion criterion. 10 patients did not complete the study. Out of the remaining 80 patients, they were divided into two groups of 40 each and they were followed up for 6 weeks (Table 1).

**Table 1: Base line characteristics of study population.**

Demographic parameters	Group A	Group B
Age	55.97±1.77	55.42±1.21
Female:Male	28:5	26:7
Height	5.42±3.73	5.41±4.31
Weight	66.33±1.81	66.48±1.29
Medical history		
Duration of illness (months)	4.91±0.72	4.96±0.40

**Table 2: Visual Analogue Scale.**

	Basal	3 weeks	Change	6 weeks	Change
Group A	78.18±1.28	41.60±1.6	37.12±1.7	25.15±1.47	53.03±1.90
Group B	81.47±1.05	27.06±1.16	54.41±1.38	10.44±0.85	71.02±0.91

**Table 3: WOMAC osteoarthritis index score.**

	Basal	3 weeks	Change	6 weeks	Change
Group A	65.38±1.38	27.68±0.92	24.93±1.93	9.00±0.85	56.38±1.22
Group B	59.94±2.41	35.00±1.62	24.93±1.93	19.85±1.54	40.09±2.06

**Table 4: Osteoarthritic severity index.**

	Basal	3 weeks	Change	6 weeks	Change
Group A	22.09±0.81	21.70±0.97	0.39±0.22	13.88±0.83	8.21±0.76
Group B	23.76±0.17	23.29±0.49	0.47±0.38	7.91±0.86	15.85±0.85

**Table 5: Patient global assessment.**

	Basal	3 weeks	Change	6 weeks	Change
Group A	1.30±0.08	3.55±0.12	2.24±0.13	3.97±0.13	2.66±0.15
Group B	1.24±0.07	4.30±0.07	3.16±0.12	4.90±0.05	3.66±0.13

**Efficacy assessments**

*Visual Analogue Scale*

Etoricoxib in dose of 30mg once daily and aceclofenac in the dose of 100mg twice daily produced significant improvement in signs and symptoms of osteoarthritis as determined by all the measures of efficacy.

Etoricoxib in dose of 30mg once daily and aceclofenac in the dose of 100mg twice daily produced significant decrease on scores on visual analogue scale. Etoricoxib reduced the score to 41.60±1.6 in 3 weeks and to 25.15±1.47 in 6 weeks as compared baseline score of 78.18±1.28 (p<0.001). Aceclofenac reduced the score to 27.06±1.16 in 3weeks and to 10.44±0.85 in 6weeks as compared to basal score of 81.47±1.05 (p <0.001). Aceclofenac produced a significantly better change in score. Both the treatments produced significant relief of pain, aceclofenac being superior to etoricoxib (Table 2).

*WOMAC osteoarthritic index*

Etoricoxib in the dose of 30mg once daily and Aceclofenac 100mg twice daily produced a significant decrease in the score of WOMAC osteoarthritic index indicating a significant reduction in pain and stiffness and an improvement in physical functioning. Aceclofenac in the dose of 100mg twice daily significantly reduced the basal score of 59.94±2.41 to 35±1.62 in 3weeks and further reduction in the score to 19.85±1.54 in 6weeks (p<0.001). Etoricoxib in the dose of 30mg once daily reduced the score to 27.68± 0.92 in 3weeks and to 9.00±0.85 in 6weeks from a basal level of 65.38±1.38 (p<0.001). Thus, both the groups produced a significant relief of pain, but with etoricoxib the response was significantly better (p<0.01) (Table 3).

*Osteoarthritis severity index*

Etoricoxib in the dose of 30 mg once daily and aceclofenac 100mg twice daily produced a significant decrease in osteoarthritic severity index. Etoricoxib reduced the basal score from 22.09±0.81 to 21.70±0.97 at 3 weeks and 13.88±0.83 at 6weeks (p <0.001) aceclofenac reduced the

basal score from 23.76±0.17 to 23.29±0.49 at 3 weeks and 7.91±0.86 at 6 weeks (p<0.001). Thus, both etoricoxib in the dose of 30mg once daily and aceclofenac 100mg twice daily produced a significant decrease in signs and symptoms but aceclofenac was found to be slightly better (Table 4).

*Patient's global index*

Etoricoxib in the dose of 30mg once daily and aceclofenac in the dose of 100mg twice daily produced a significant increase in the scores of patients' global assessment implying a significant improvement in signs and symptoms. Etoricoxib increased the score from a basal score of 1.30±0.08 to 3.55±0.12 at 3weeks and 3.97±0.13 at 6weeks (p <0.01). Aceclofenac increased the basal score of 1.24±0.07 to 4.30±0.07 at 3weeks and 4.90±0.05 at 6weeks (p<0.01) thus improvement in patient global index was significantly better with aceclofenac than with etoricoxib (Table 5).

*Physicians global assessment*

Etoricoxib in the dose of 30mg once daily and aceclofenac in the dose of 100mg twice daily produced a significant increase in the scores of physicians' global assessment implying a significant improvement in signs and symptoms. Etoricoxib increased the score from a basal score of 1.21±0.07 to 3.58±0.14 at 3weeks and 4.00±0.15 at 6weeks (p <0.01). Aceclofenac increased the basal score of 1.65±0.17 to 4.52±0.08 at 3weeks and 4.91±0.04. So, there was significantly better increase in physicians' global index in patients taking aceclofenac as compared to etoricoxib (Table 6).

**Safety assessment**

*Gastrointestinal tract related adverse effects*

Gastrointestinal tract (GIT) related adverse effects were mostly found to be mild to moderate in nature. These were reported in 7.5% of patients taking aceclofenac. Patients had problems of abdominal pain, diarrhoea, dyspepsia, flatulence and nausea. Whereas no adverse events were reported by patients taking etoricoxib (Table 7).

**Table 6: Physicians global index.**

	Basal	3 weeks	Change	6 weeks	Change
Group A	1.21±0.07	3.58±0.14	2.36±0.10	4.00±0.15	2.78±0.13
Group B	1.65±0.17	4.52±0.08	3.02±0.20	4.91±0.04	3.26±0.17

*Adverse events other than GIT*

Only one patient was reported to have rash in the group treated with aceclofenac. Etoricoxib was found to be better tolerated as compared to aceclofenac (Table 7).

**DISCUSSION**

Non-steroidal anti-inflammatory drugs are widely used for the relief of pain, stiffness and joint swelling in osteoarthritis and rheumatoid arthritis.

**Table 7: Incidence of adverse effects during the study period.**

Adverse effects	Group A (Etoricoxib)	Group B (Aceclofenac)
<b>GIT adverse effects</b>		
Abdominal pain	-	3 (7.5%)
Diarrhoea	-	3 (7.5%)
Dyspepsia	-	3 (7.5%)
Flatulence	-	3 (7.5%)
Nausea	-	3 (7.5%)
<b>Non-GIT adverse effects</b>		
Skin rash	-	1 (2.5%)

Although NSAIDs are generally well tolerated, upper gastrointestinal adverse effects dyspepsia, nausea and abdominal pain, mucosal lesions and serious complications such as bleeding and perforation are associated with their use. As the adverse effects of conventional NSAIDs are mainly due to inhibition of COX-1 while therapeutic effects result from COX-2 inhibition. So, drugs which are selective COX-2 inhibitors seem to be promising alternatives in patients intolerant to conventional NSAIDs.

Etoricoxib, selective COX-2 inhibitor, has shown promising role for symptomatic relief from pain and inflammation in patients of OA without any gastrointestinal adverse effect. Many studies have demonstrated that etoricoxib is equally efficacious and has better safety profile as compared to conventional NSAIDs.<sup>15</sup>

So, the present study was conducted to assess the safety and efficacy etoricoxib versus aceclofenac, a commonly used conventional non-steroidal anti-inflammatory drug in the patients coming to the out-patient department, Department of Orthopaedics, Guru Nanak Dev Hospital, Government Medical College, Amritsar.

Etoricoxib is recommended in a dose of 30mg once daily in patients of osteoarthritis. For aceclofenac, the standard dose which is recommended is 100mg twice daily. Both etoricoxib and aceclofenac produced significant improvement in signs and symptoms of osteoarthritis as determined by all the measures of efficacy.

Both etoricoxib and aceclofenac produced significant decrease in scores on visual analogue scale. In a randomized controlled trial, comparing the efficacy of aceclofenac and etoricoxib in pain control over baseline on visual analogue scale, documented to have statistically significant results in both the treatment groups.<sup>16</sup> However, in present study, both the treatments produced significant relief of pain, aceclofenac being superior to etoricoxib in terms of change in visual analogue scale score.

Etoricoxib in the dose of 30mg once daily and aceclofenac 100mg twice daily produced a significant decrease in the score of WOMAC osteoarthritic index indicating a

significant reduction in pain and stiffness and an improvement in physical functioning; with response to etoricoxib better as compared to aceclofenac. In a randomized, double blind, placebo and active comparator-controlled trial conducted in 617 adults with knee OA, etoricoxib was more effective than placebo after six weeks as measured by WOMAC pain sub-scale.<sup>17</sup>

Etoricoxib in the dose of 30 mg once daily and aceclofenac 100 mg twice daily produced a significant decrease in osteoarthritic severity index; but aceclofenac was found to be slightly better. In a systematic review including nine prospective studies, comparing the safety, efficacy and tolerability, aceclofenac was superior in decreasing osteoarthritis severity index.<sup>18</sup>

Etoricoxib in the dose of 30mg once daily and aceclofenac in the dose of 100mg twice daily produced a significant increase in the scores of patients' global assessment implying a significant improvement in signs and symptoms; with aceclofenac better than etoricoxib. In a double blind randomized controlled trial conducted for six weeks to evaluate efficacy and tolerability of aceclofenac for the treatment of symptomatic OA patients, showed significant improvement in patients' global assessment of disease activity.<sup>19</sup>

Etoricoxib in the dose of 30mg once daily and Aceclofenac in the dose of 100mg twice daily produced a significant increase in the scores of physicians' global assessment implying a significant improvement in signs and symptoms, with aceclofenac showing significantly better improvement in physicians' global index. In a double blind randomized controlled trial conducted for six weeks to evaluate efficacy and tolerability of aceclofenac for the treatment of symptomatic OA patients, showed significant improvement in physicians' global assessment of disease activity.<sup>19</sup>

GI related adverse drug reactions (ADR) were reported in the group taking aceclofenac while no such ADR reported in patients on etoricoxib. Thus, etoricoxib showed better GI tolerability as compared to aceclofenac. In a randomized, double blind trial, conducted to compare the GI tolerability, safety and efficacy of etoricoxib in patients' with OA, it was associated with significantly better GI tolerability.<sup>20</sup>

Limitations of the present research was a study involving 80 patients and no placebo control was used in this study in view of the ethical problems. The subjects themselves acted as their own controls. Moreover, study was of 6weeks duration thereby a comparison was made only between short-term efficacy and safety of the drugs.

## CONCLUSION

Etoricoxib 30mg once daily and aceclofenac 100mg twice daily were found to be effective in relieving the signs and symptoms of osteoarthritis. Aceclofenac was found to be superior to etoricoxib in some of the parameters of efficacy

while it was found to be similar in the other efficacy parameters. Both the drug treatments were found to be well tolerated. Adverse effects were observed with aceclofenac as compared to etoricoxib. Thus, absence of adverse drug reactions with etoricoxib 30 mg while exhibiting a good clinical efficacy which was comparable to aceclofenac, a conventional nonsteroidal anti-inflammatory drug makes etoricoxib a useful alternative in patients with osteoarthritis, as NSAIDs are so commonly found to be responsible for adverse effects specifically pertaining to gastrointestinal tract. The findings of the present study need to be proved in further studies involving a larger sample size for a period of more than six weeks. Etoricoxib is a better alternative to conventional NSAIDs for the symptomatic management of osteoarthritis as the safety profile is better. Moreover, etoricoxib is not only safer but found to be clinically efficacious as compared to aceclofenac in the present study.

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