



Universidad Autónoma del Estado de Hidalgo



Instituto de Ciencias de la Salud

**Dr. Mario Ortiz Ramírez**

Effectiveness of Diclofenac, Ketorolac, and Etoricoxib in the treatment of acute pain originated by ankle fracture.

Eficacia de Diclofenaco, Ketorolaco y Etoricoxib en el tratamiento de dolor agudo originado por fractura de tobillo.



## ABSTRACT

Tissue degeneration, infection, inflammation, cancer, trauma, surgery and limb fractures all produce pain. Each of these physiological abnormalities requires a therapeutic approach different from the last. In acute pain, caused by fracture, several classes of analgesics have been utilized. These basic remedies for analgesia, however, are still confined to a small number of medications, including nonsteroidal anti-inflammatory drugs (NSAIDs), local anesthetics and opioids. In addition, most of these drugs have side effects, limiting their use in clinical practice. The purpose of this study was to compare the efficacy of three NSAIDs to relief acute pain caused by ankle fracture. Sixty subjects with ankle fracture were randomized to receive ketorolac, diclofenac, or etoricoxib, every 12 hours in a prospective, double-blind study. Forty-nine patients completed the study. The subjects' assessments of ankle pain on the visual analog scale and a Likert scale showed a significant reduction from baseline over 24 hr, regardless the treatment group.

**KEY WORDS: NSAIDs, ketorolac, diclofenac, etoricoxib**



## RESUMEN

La degeneración de tejidos, infección, inflamación, el cáncer, los traumatismos, la cirugía y la integridad física todos producen el dolor. Cada una de estas anomalías fisiológicas requiere un enfoque terapéutico diferente de la última. En el dolor agudo, causado por la rotura, varias clases de analgésicos se han utilizado. Estos remedios básicos para la analgesia, sin embargo, aún se encuentran confinados a un pequeño número de medicamentos, incluyendo medicamentos antiinflamatorios no esteroideos (AINEs), los anestésicos locales y opioides. Además, la mayoría de estos medicamentos tienen efectos secundarios, lo que limita su uso en la práctica clínica. El propósito de este estudio fue comparar la eficacia de tres AINE para el alivio del dolor agudo causado por una fractura de tobillo. Sesenta pacientes con fractura de tobillo fueron aleatorizados para recibir el ketorolaco, diclofenaco, o etoricoxib, cada 12 horas en un estudio prospectivo, doble ciego. Cuarenta y nueve pacientes completaron el estudio. Evaluaciones de los sujetos de dolor en el tobillo en la escala analógica visual y una escala de Likert mostraron una reducción significativa desde el inicio de más de 24 horas, sin tener en cuenta el grupo de tratamiento. Todos los tratamientos mostraron un perfil similar en la reducción del dolor

**KEY WORDS: AINES ketorolaco, diclofenaco, etoricoxib**



EFFECTIVENESS OF DICLOFENAC, KETOROLAC AND ETORICOXIB IN THE TREATMENT OF ACUTE PAIN ORIGINATED BY ANKLE FRACTURE.

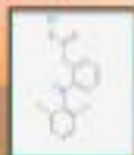
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### INTRODUCTION

A number of various situations are prone to develop pain symptomatology, such as tissue degeneration, infection, inflammation, cancer, trauma, surgery and limb fractures. Each of these physiological abnormalities requires a therapeutic approach different from the last. In acute pain, caused by fracture and/or surgery, several classes of analgesics have been utilized. These basic remedies for analgesia, however, are still confined to a small number of medications, including nonsteroidal anti-inflammatory drugs (NSAIDs), local anesthetics and opioids. In addition, most of these drugs have side effects, limiting their use in clinical practice. The purpose of this study was to compare the efficacy of three NSAIDs to relief acute pain caused by ankle fracture.



DICLOFENAC



KETOROLAC

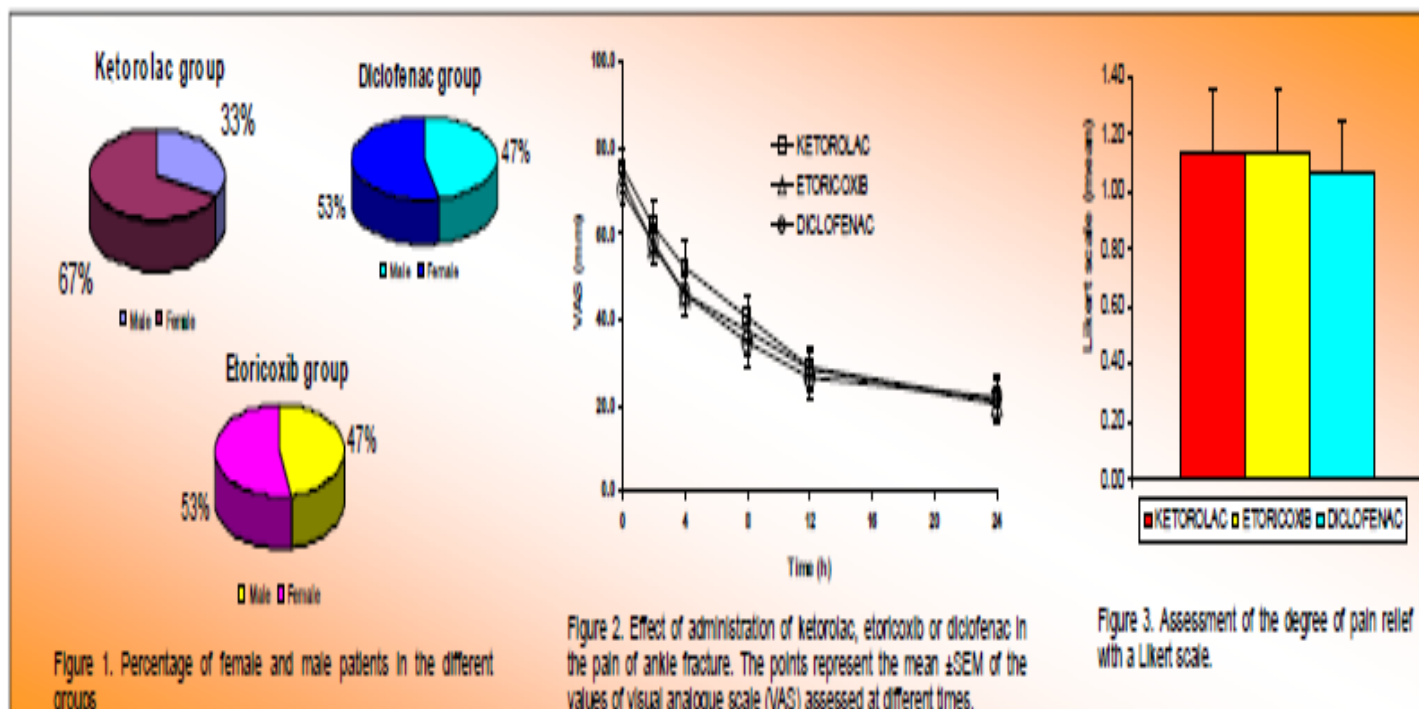


ETORICOXIB



### METHODS

- Patients with recent ankle fracture (less than 6 hours)
- Age range: 18 to 55 years,
- Acute pain according to a visual analog scale (VAS) of 40 mm or more
- Patients were randomized into three groups: group A - ketorolac (10 mg tablets), group B - etoricoxib (60 mg tablets) and group C - diclofenac (140 mg capsules).
- Pain level was assessed at 0, 2, 4, 8, 12 and 24 hours
- At 24 hours after initiation of treatment was assessed the degree of pain relief with a Likert scale where 0 = complete relief: no pain during treatment, 1 = slight relief, pain intermittently throughout the study, which is very tolerable., 2 = moderate relief pain intermittently throughout the study, which causes inconvenience and discomfort to the patient, but not leaving the study and 3 = None: no pain subsided with treatment.





## RESULTS

- Completed the study: 15 of the ketorolac group, 17 for the etoricoxib group and 17 for the diclofenac group
- There was no statistically significant differences in the characteristics of the population studied in the 3 treatment groups
- Average age in the ketorolac group was  $38.9 \pm 14$  years,  $38.1 \pm 19.4$  for etoricoxib group and  $36.7 \pm 10.1$  for the diclofenac group
- Ketorolac reduced pain in patients with ankle fracture in a 74.5%, etoricoxib decrease it in a 74.3% and diclofenac in a 70.9%



## CONCLUSIONS

**Our data suggest that ketorolac, diclofenac or etoricoxib are effective in reducing the acute pain caused by ankle fracture. Furthermore, the selective inhibitor of COX-2 etoricoxib proved to be as effective as ketorolac and diclofenac.**





**EFFECTIVENESS OF DICLOFENAC, KETOROLAC AND ETORICOXIB IN THE TREATMENT OF ACUTE PAIN ORIGINATED BY ANKLE FRACTURE.**

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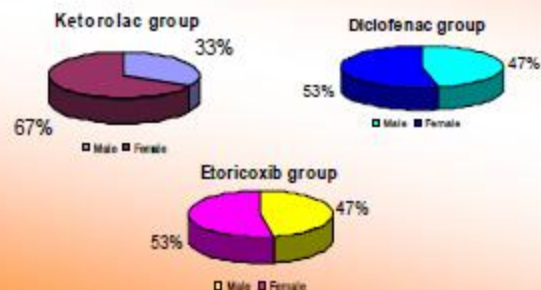


Figure 1. Percentage of female and male patients in the different groups

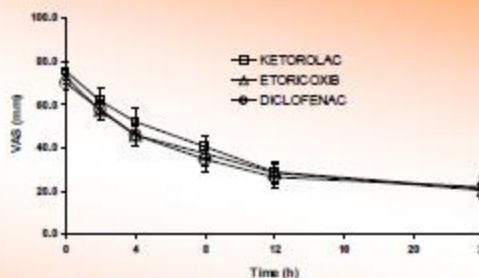


Figure 2. Effect of administration of ketorolac, etoricoxib or diclofenac in the pain of ankle fracture. The points represent the mean ±SEM of the values of visual analogue scale (VAS) assessed at different times.

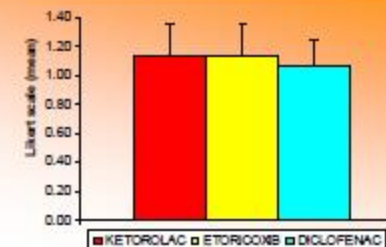


Figure 3. Assessment of the degree of pain relief with a Likert scale.

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