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Ketoprofen Versus Indomethacin in the Treatment of Acute Gouty Arthritis.

Dr. Ali Tariq Hussein[1*], Dr. Khamis Y. C. Al-Qubaeiss[2], Dr. Noor Abbas Almahdawy[3]

[1]M. B. Ch. B., A. B. E. M., \ (Emergency Medicine) Consultant Emergency Medicine NMC Royal Hospital, Khalifa City, Abu Dhabi, UAE.*
[2]M. B.Ch. B., MSc., PhD., \ (Rheumatologist & Physiatrist) Membership of ACR & BSR Iraqi Ministry of Health, Anbar Health Directorate, Al-Ramadi Teaching Hospital, Rheumatology Department, Anbar, Iraq.
[3]M. B.Ch. B., H. D. R. M R., (Rheumatology and Medical Rehabilitation) Iraqi Ministry of Health, Baghdad, Al Rusafa Health Department Ibn Al-Kuf Hospital for Spinal Cord Injury Rehabilitation, Baghdad, Iraq.

Email: [2]alqubaeissykhamis@yahoo.co.uk, [3]Almahdawynoor@gmail.com
Corresponding Email: [1]a.tariq36@gmail.com*

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Abstract: ***A cross-sectional study of 80 patients was intended to evaluate the efficacy of Ketoprofen versus indomethacin in the treatment of acute gouty arthritis. This study was designed by making a comparison between the types of treatment used, in addition to knowing the type of statistical relationship. Demographic information and data were collected from different hospitals in Iraq during a one-year study period from March 2022 to February 2023. This study was conducted for patients with acute gouty arthritis, an extremely painful condition; NSAIDs are the first-line medication for a gouty arthritis attack. In this study, drug efficacy was assessed using joint tests before the start of the study, after five days, and at the end of treatment. On the background of treatment and, by the fifth day of treatment, there was a statistically significant improvement in all clinical indicators used to assess joint syndrome in patients with gout, and this trend increased at the end of the treatment course. Therefore, the attack of arthritis was stopped on the fifth day, and we conclude from this study that there is a statistical relationship between the use of the treatment and the improvement of patient outcomes through the significant increase in the quality of life for patients.***

Keywords: Ketoprofen, Indomethacin, Acute Gouty Arthritis, Dose, Treatment.

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1. INTRODUCTION

NSAIDs are the main class of medication used in internal medicine and rheumatology as an analgesic and anti-inflammatory agent. The choice of an NSAID is based on an assessment of the safety of a particular drug. This review examines data from large studies that examined the efficacy and safety of ketoprofen and indomethacin [1,2].

Non-steroidal anti-inflammatory drugs (NSAIDs) are the most important class of drugs used for acute and chronic pain relief in clinical practice. NSAIDs have a combination of analgesic, anti-inflammatory, and antipyretic effects, which gives them an advantage over paracetamol and opioids [3].

The risk of complications with use is representative of the most common 'conventional' NSAIDs and from previous studies. Through a meta-analysis of 25 population studies conducted in 18 independent populations, the individual risk of complications from different NSAIDs was represented [4,5]. The evaluation criterion was the frequency of MI. , whose development was observed in about 100 patients. Minimum risks of MI were shown for naproxen (odds ratio (OR) 1.06) and celecoxib (OR 1.12) [6].

Ketoprofen is a very successful method of immediate pain relief. In 2009, a meta-analysis was published evaluating the results of single-dose ketoprofen at a dose of 25-100 mg for acute pain after surgery. The material was data from 14 randomized controlled trials (968 patients treated with ketoprofen, 520 placeboes); the main evaluation criterion was pain reduction >50% for 4 to 6 hours. The researchers used the NNT index (number needed to treat), which shows the number of patients who needed treatment to achieve a significant difference, and this index was 2.4-3.3, indicating a fairly high efficiency of the drug [7,8,9].
The work of S. Karvonen et al. is an example of the successful use of ketoprofen and indomethacin in surgical practice. Here, ketoprofen at a dose of 300 mg/day was used in 60 patients undergoing orthopedic surgery [10,11,12]. Control consisted of patients treated with either medication or paracetamol four g/day. The measure of effectiveness, in addition to reducing pain intensity, was the evaluation of an 'opioid sparing' effect which was determined by comparing the fentanyl dose required for stable analgesia. This effect was only observed in the ketoprofen group: the average fentanyl dose here was 22% lower compared to the placebo group placebo and 28% lower compared to the Paracetamol group [13].

2. MATERIAL AND METHOD

In this study, 80 patients were collected from different hospitals in Iraq, where demographic information and data were collected. The study included patients with acute gouty arthritis, and informed consent was obtained for the purpose of obtaining treatment. Developed by the American Rheumatology Association and approved by the World Health Organization and hyperuricemia (HU) was diagnosed according to the EULAR criteria (2006) [5]. The inclusion criteria for the patients were as follows: age over 18 years, acute gouty arthritis that lasted no more than a month, and the exclusion criteria from the study were: severe arthritis, history of cardiovascular complications, arrhythmias, severe comorbidities of the

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gastrointestinal tract, Liver, kidney, heart failure, history of oncology, as well as patients taking anticoagulants, glucocorticoids, colchicine. Ketoprofen (Ketonal) was given in a dose of 2 mL (50 mg/mL) intramuscularly once daily for ten days. The effectiveness of the drug was evaluated before the start of the study, after five days, and after the end of treatment - after ten days. All patients underwent a complete clinical examination, including anthropometrics (body weight, height, body mass index (BMI)), general clinical blood and urine tests, a biochemical study of serum lipid profile, glucose, creatinine, urea, transaminases, factor Acute gouty arthritis, C-reactive protein, ultrasound of the affected kidneys and joints. Along with the clinical data, arthritic tests were evaluated: the intensity of pain in the joints during movement and at rest using a 100 mm visual analog scale (VAS), the number of swollen joints was counted, and the general condition of the patient (GSP) was assessed using the VAS scale. Evaluating the results according to the IBM SOFT SPSS 22.0 program, where the statistical data processing was performed using the Statistical 10.0 program, and the sample size, mean, median, standard deviation, and percentages were evaluated. The significance of the indicators was determined using the Student's t-test, based on the assumption that the compared samples belong to normal distributions, in addition to evaluating the statistical differences according to the results of the study according to the statistical significance at $P < 0.05$.

3. RESULTS

Table 1: General characteristics of the patient

Variable	Ketoprofen	indomethacin
Age		
20-24	7	3
25-29	10	5
30-34	13	19
35-40	10	13
Sex		
Male	30	28
Female	10	12
comorbidities		
T2D	10	8
Hypertension	5	5
Obesity	6	5
Others	19	12
Smoking		
Yes	7	5
No	33	35
Disease duration, years, I [Q1; Q3]	3.2 (1.4-5.9)	3.3 (1.2-6.4)
Number of attacks (per year), M ± SD	1.98 ± 0.67	2.1±0.88

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Lifetime total of previous attacks, no.		
0	4	5
1–4	19	20
>5	17	15
BMI	32.25 ± 4.64	31.1±3.2
Weight gain, n (%)	14 (35)	12 (30)
Hypercholesterolemia, n (%)	21 (52.5)	18 (45)

Table 2: The dose size that patients receive

Variable	mg	times
ketoprofen	100	3
indomethacin	50	3

Table 3: Distribution of patients according to symptoms of gout

Variable	ketoprofen	indomethacin
joint redness	7	10
Joint heat.	6	8
joint swelling	10	12
Joint stiffness.	17	10

Table 4: Distribution of the disease according to the causes of the disease

Variable	ketoprofen	indomethacin
High level of uric acid in the blood	5	7
Diabetes.	11	8
Obesity.	6	5
Genetics and family history of gout.	4	6
purine-rich foods,	4	4

Table 5- Final outcomes of result according to assessment patients (ketoprofen)

Ex	Baseline (n=21)	In 5 days	After ten days (n=21)

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VAS at rest,	33.0±10.4	12.3±9.9**	3.6±9.3*
VAS while moving	66.3±12.2	32.2±14.4**	14.4±7.7**
Joint index, points	2.2±1.1	1.1±0.8*	0.3±0.2*
Swelling index, points	2.1±1.4	1.3±0.4**	0.22±0.5 ***

Table 6- Final outcomes of result according to assessment patients (indomethacin)

Ex	Baseline (n=21)	In 5 days	After ten days (n=21)
VAS at rest,	29.3±5.5	15.5±7.8*	2.8±5.5*
VAS while moving	70.7±5.5	40.4±10.6	19.3±6.7**
Joint index, points	2.1±1.1	1.8±0.55*	0.455±0.565*
Swelling index, points	2.1±1.4	1.3±0.4**	0.22±0.5 ***

Table 7- Evaluate adverse outcomes that occurred with patients using ketoprofen and indomethacin

ex	ketoprofen	indomethacin	P value
Cardiovascular complications	**2**	**1**	0.44
Unstable arterial hypertension	**1**	**1**	0.00
Increased systolic pressure			
Headache	**1**	**1**	0.00
dizziness;	**2**	**0**	0.002

Table 8- Evaluation of the relationship between Ketoprofen and indomethacin in the treatment of acute gouty arthritis.

	V	V	Ketoprofen	indomethacin
Joint index, points	R	1	+0.98	+0.44
	SIG	---	0.0023	0.001
Swelling index, points	R	1	0.5 *	0.2 **
	SIG	--	0.004	0.000
General complication	R	1	0.74 *	0.88 **
	SIG		0.0002321	0.00

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4. DISCUSSION

It is known that in acute gouty arthritis of the joint, there is a rapid increase in inflammatory reactions within several hours, with massive production of TNF-α and other pro-inflammatory cytokines. The use of NSAIDs in acute gouty arthritis has been proven by experts and is reflected in recent recommendations for the treatment of gout [14,15]. However, the appointment of a drug from the NSAID group is still experimental, random, and largely based on the experience of the physician [16,17,18]. In the work of home rheumatologists, a number of NSAIDs have shown good efficacy in an attack of gouty arthritis. Thus, a number of studies have shown the effectiveness of treatment in terms of the speed and effectiveness of stopping acute and chronic gouty arthritis [19]. In our study, it shows high clinical efficacy when used intramuscularly at a dose (100 mg/mL) for ten days in acute gouty arthritis due to the fact that the maximum ketone concentration is reached after 1-2 hours. As is additionally known, ketoprofen does not significantly affect the synthesis of proteoglycans by chondrocytes in in vitro and in vivo studies [20], i.e., it does not adversely affect articular cartilage. NSAIDs are considered first-line drugs in the treatment of acute gouty arthritis. However, when prescribing drugs from the group of NSAIDs, one should take into account the wide range of adverse drug interactions of this class of drugs while assessing the risks of their composition and drug interactions. Potential, with particular attention to selecting the optimal dose and duration of treatment, taking into account the pronounced analgesic effect and favorable safety profile, as an alternative to NSAIDs for the relief of pain in acute gouty arthritis [21,22]. An open, controlled, randomized, parallel study was conducted to compare the analgesic effect of Ketoprofen in patients with acute low back pain. The study included 164 patients (age: 18 to 72 years) diagnosed with acute low back pain, the severity of which was at least 80 points on the scale. Optical analogue. The results of the study showed the effectiveness of Ketoprofen compared to diclofenac sodium in this group of patients. It should be noted that ketoprofen has good anti-inflammatory potential, and the best model for evaluating the anti-inflammatory effect of NSAIDs is the relief of gouty arthritis, in which severe pain is determined by the acute inflammatory response. Indomethacin, which has anti-inflammatory properties, has long been considered the "gold standard" for treating this condition. Ketoprofen has been compared, as shown by R. Altman et al., successfully with this drug. In the study, 59 patients with acute gouty arthritis took ketoprofen 100 mg 3 times daily or indomethacin 50 mg 3 times daily for seven days. Ketoprofen provided significant pain relief on the first day of treatment in 92% of patients. In the control group, it was 91%. After a week of treatment, the attack stopped completely in 24% and 22% of patients. As can be seen, ketoprofen was not inferior to indomethacin in terms of effectiveness. But at the same time, he clearly surpassed it in terms of safety - against the background of taking indomethacin, any side effects were observed in 20% of patients, and in the ketoprofen group - only in 11% [18].

5. CONCLUSION

The above data allow us to conclude that ketoprofen is a highly effective representative of NSAIDs and is one of the drugs of choice for the initial treatment of both acute and chronic nociceptive pain. At the same time, the potential for side effects of ketoprofen is not higher

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than that of other NSAIDs known in the clinic. Indomethacin, in combination with NSAIDs, reduces the risk of complications by finding a statistically significant association with positive outcomes.

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