The Role of Colchicine in Treatment of knee Osteoarthritic Patients

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ABSTRACT

Background: The treatment of osteoarthritis was analgesia, and physiotherapy with intra-articular steroid injection improved the symptoms of the disease. It was found that cartilage damage will enhance an inflammatory process.

Aim: This study assesses the adjuvant effect of treatment with colchicine and analgesia in knee osteoarthritis.

Methods: This study includes 60 patients confirmed to have osteoarthritis of knee joints as diagnosed by a rheumatologist. Blood tests include ESR and CRP as inflammatory markers. We divided the patients into two groups matching age and gender; the duration of treatment and follow-up was 8 weeks. The first group enrolled 30 patients who received paracetamol (2 g/day) with physiotherapy; the other group enrolled 30 patients who received colchicine with a dosage of 0.5 mg daily and analgesics (2 g/day) and physiotherapy for the same period.

Results: Colchicine had significantly improved knee pain by 44.7%. Visual Analogue Scale-pain score (45.20 ± 12.9 to 24.9 ± 12.9, p<0.001).

Conclusion: Colchicine appears to be useful for treating knee osteoarthritis. It improves pain and decreases the need for joint replacement.

Keywords: Osteoarthritis, colchicine, paracetamol, physiotherapy.

دور الكولجيسين في علاج مرضى سوفان المفاصل الركب

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الخلاصة

الخلفية: كان علاج سوفان المفصل عن طريق المسكنات والعلاج الطبيعي و بحقن الستيرويدات داخل المفصل مما يحسن من أعراض المرض. وقد وجد أن تلف الغضروف من شأنه أن يعزز العملية الالتهابية.

الهدف: يقوم هذه البحث بدراسة التأثير المساعد للعلاج بالكولجيسين والمسكنات في سوفان مفاصل الركب.

المرضى والطرق: شملت هذه الدراسة ٦٠ مريضًا تم تأكيد إصابتهم بسوفان مفاصل الركب كما تم تشخيصها من قبل أخصائي أمراض الروماتيزم. يتضمن اختبار الدم معدل ترسيب كرات الدم الحمراء وبروتين سي التفاعلي كعلامات التهابية. قمنا بتقسيم المرضى إلى مجموعتين تتناسبان مع العمر والجنس، وكانت مدة العلاج والمتابعة ٨ أسابيع. المجموعة الأولى ضمت ٣٠ مريضاً تلقوا الباراسيتامول (٢ جرام/يوم) مع العلاج الطبيعي، والمجموعة الأخرى ضمت ٣٠ مريضاً تلقوا الكولجيسين بجرعة ٠.٥ ملجم يومياً مع مسكنات الألم (٢ جرام/يوم) والعلاج الطبيعي لنفس الفترة.

النتائج: أظهر الكولجيسين تحسناً ملحوظاً في آلام الركبة بنسبة ٤٤.٧%. مقياس الألم التناظري البصري (من ٤٥.٢٠ ± ١٢.٩ إلى ٢٤.٩ ± ١٢.٩، قيمة p<0.001).

الخلاصة: يبدو أن إضافة الكولجيسين مفيدة في علاج سوفان مفاصل في الركب. فهو يحسن الألم ويقلل الحاجة إلى استبدال المفصل.

الكلمات المفتاحية: هشاشة العظام، الكولشيسين، الباراسيتامول، العلاج الطبيعي.

INTRODUCTION

Osteoarthritis (OA) causes pain and loss of function of the affected joint due to the distraction of articular cartilage, narrowing of joint space, sclerosis, new bone formation at the joint margin, and enlargement of ends of bones leading to pressure on the capsule of the joint, also source of pain may be from periarticular tissue like ligaments, and enthesis. Besides that, the mild inflammatory process is going on, leading to mild synovitis. [1].

Patients with knee osteoarthritis (KOA) also suffer from difficulty in movement, so they cannot do their usual daily activities, and sometimes they depend on aids. [2,3]. The number of patients in the next few years is suspected to increase, especially in western countries owing to aging and increased weight [4]. The traditional treatment is limited to analgesia; in severe cases, joint replacement is the choice. Better understanding the pathophysiology of the disease raises the need for agents that modify the inflammatory process that may be blamed for the disease's etiological process [5,6]. Uric acid may be one of those factors. Shedding into synovial fluid enhances an inflammatory process by releasing inflammatory markers such as interleukin (IL)-18 [7-10]. Attacks of gout may occur in joints with OA [11,12]. Colchicine changes innate immunity and decreases the release of many inflammatory responsible agents, together with non-pharmacological therapies such as exercises of the gluteus and quadriceps femora's muscles, reducing weight [13-15].

Colchicine modulates neutrophil function and decreases its adhesion to the endothelium wall. [16,17].

METHODS

Sixty patients were enrolled in this study from October 2022 to October 2023 in the Department of Rheumatology of Mosul Teaching Hospital. An interview was conducted to understand the research procedures and the ethical committee of the College of Medicine at the University of Mosul approved the ethical agreement for the study.

All the patients had clinical and radiographic manifestations of KOA [18,19].

Exclusion Criteria

Patients with other inflammatory joint diseases such as gout calcium pyrophosphate deposition.

Clinical Assessment

All patients had joint pain mainly exaggerated by movement and relieved by rest. The severity of the pain was measured using the Visual Analogue Scale (VAS). Morning stiffness of less than (15minitus) and local examinations of the joints revealed tenderness of the margin of the joint movement and limitation of movement due to osteophytes, palpable crepitus, and bony swelling around the joint margin, with some synovial thickening.

Radiological Investigation

Image studies, including X-rays of both knee joints (anteroposterior and lateral views), were obtained for all participants to evaluate joint space narrowing, subchondral sclerosis, osteophytes, and deformity contour [20].

Laboratory Investigations

Includes ESR and CRP', patients with high uric acid were excluded from this study

Intervention

Patients were randomly divided into two groups as follows:

Group 1 received acetaminophen 2 gm daily plus physiotherapy for 8 weeks, while group 2 received acetaminophen 2 gm plus physiotherapy with colchicine 0.5 mg daily for the same period.

Statistical Analysis

In this study, a Chi-square test and independent T-test of two means were employed for both categorical and quantitative variables, respectively, d.f = 1. * Improvement rate (%) = [(before – after) / before] × 100. A paired T-test of two means was used. Improvement rate (%) = [(before – after) / Before] × 100.

RESULTS

This study enrolled 60 patients with KOA; in the first group, there were 22 (73.3%) females and 8 (26.7%) males. The mean age was (64.3 ± 6.12); on the other hand, the second group enrolled 20 (66.7%) females and 10 (33.3%) males with an average age of (62.2 ± 5.95).

Table (1): Personal characteristics of knee osteoarthritic patients.

Parameters	G I (Traditional treatment) [n = 30]	G II (Colchicine) [n = 30]	P-value*
Mean age (years)	64.3 ± 6.12	62.2 ± 5.95	0.170
Range (years)	50.0 – 75.0	50.0 – 70.0	---
Gender	**(%)**	**(%)**	---
Female	22 (73.3)	20 (66.7)	0.573
Male	8 (26.7)	10 (33.3)	

***** An independent T-test of two means is employed for quantitative variables, and a Chi-square test is used for categorical variables, d.f = 1.

Table (1) shows the personal characteristics of KOA of both groups.

Table (2): Comparison in inflammatory markers and VAS between the two study-sampled KOA patients at the beginning of the study.

Parameters	G I (Traditional treatment) [n = 30]	G II (Colchicine) [n = 30]	P-value*
ESR (ml/hour)	36.2 ± 14.60	41.7 ± 10.20	0.101
CRP (mg/L)	7.6 ± 2.16	7.3 ± 1.51	0.451
VAS pain score	51.0 ± 10.30	45.20 ± 12.9	0.058

***** An independent T-test of two means was used.

Table (2) compares VAS (Visual Analog Scale) and inflammatory markers between the two groups at the beginning of the study.

Table (3): Comparison in inflammatory markers and VAS between the two study-sampled KOA patients after 8 weeks of follow-up.

Parameters	G I (Traditional treatment) [n = 30]	G II (Colchicine) [n = 30]	P-value*
ESR (ml/hour)	32.9 ± 11.40	25.7 ± 7.74	0.005
CRP (mg/L)	6.0 ± 1.87	4.4 ± 1.25	0.001
VAS pain score	41.5 ± 11.00	24.9 ± 8.48	0.001

* An independent T-test of two means was used.

Table (3) describes the results after 8 weeks of treatment.

Table (4): The percent improvement rate in inflammatory markers and VAS in G I at the end of the study.

	G I (Traditional treatment) [n = 30]			
Parameters	**At the beginning of the study**	**After 8 weeks of follow-up**	**Improvement rate (%) ***	**P-value****
ESR (ml/hour)	36.2 ± 14.60	32.9 ± 11.40	9.1	0.289
CRP (mg/L)	7.6 ± 2.16	6.0 ± 1.87	21.0	0.002
VAS pain score	51.0 ± 10.30	41.5 ± 11.00	18.6	0.002

*Improvement rate (%) = [(before – after) / before] × 100.
** A paired T-test of two means was used.

Table (5): The percent improvement rate in inflammatory markers and VAS in G II at the end of the study.

	G II (Colchicine) [n = 30]			
Parameters	**At the beginning of the study**	**After 8 weeks of follow-up**	**Improvement rate (%) ***	**P-value****
ESR (ml/hour)	41.7 ± 10.20	25.7 ± 7.74	38.4	0.001
CRP (mg/L)	7.3 ± 1.51	4.4 ± 1.25	40.1	0.001
VAS pain score	45.20 ± 12.9	24.9 ± 8.48	44.7	0.001

* Improvement rate (%) = [(before – after) / Before] × 100.
** A paired T-test of two means was used.

Tables (4 and 5) showed the improvement rate between the two groups; the same results appear in Figure (1).

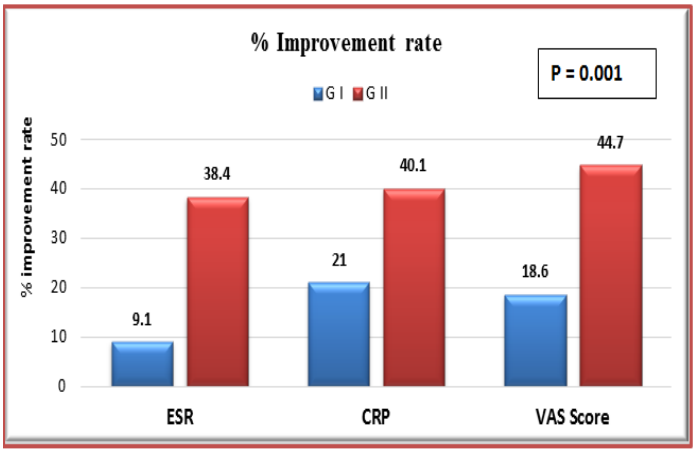

Figure (1): Comparison in % improvement rate percentage between the two groups.

DISCUSSION

Participants of this study were mainly elderly females and males (Table 1), and there was no statistical difference between the two groups concerning pain and inflammatory markers (Table 2). After having colchicine, the pain is improved. Table 5 illustrated a 44.7% improvement rate and a significant decrease in inflammatory markers ESR and CRP 38.5%, 40.1 sequentially. The efficiency of colchicine in KOA has been described by authors in [21-23]. Their study includes intra-articular steroid injection with colchicine therapy, which showed a better improvement rate than intra-articular injection alone. Similar to this research, this research yielded an improvement by colchicine (30%) in pain and movement. The improvement rate was lower in the subgroup of patients with substantial knee effusions [22]. The findings in this research are in agreement with the research of [23], which found that patients who received colchicine 0.5 mg twice a day with a placebo, in comparison to another group who received colchicine with100 mg nimesulide twice daily for 4 weeks, the second group showed better improvement in agreement with our findings.

Likewise, Aran et al. [17] found that colchicine significantly improves symptoms of the KOA in their patient sample, a group of elderly patients split into two groups. The first one had 0.5 mg of colchicine two times a day, while the other group received a placebo. The two groups of patients received regular OA drugs in the form of paracetamol 2 gm a day. The findings illustrated that paracetamol was not superior to colchicine compared to placebo.

The same study was carried out by Erden et al. in [24], which showed that colchicine and paracetamol improved pain.

The experiments showed that colchicine has many anti-inflammatory effects and is prone to accumulate in white blood cells, with concentrations in neutrophils over 16 times higher than peak plasma levels. This elevated intracellular concentration may reduce neutrophil recruitment, lower inflammation caused by MSU crystals, and inhibit IL-1 production. Colchicine could also reduce inflammation through its antioxidant properties [24].

CONCLUSION

Colchicine is effective in treating KOA and has fewer side effects than simple immune suppressive therapy.

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