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INITIAL ASSESSMENT OF EFFECTIVENESS OF INTRA-ARTICULAR MD-KNEE INJECTION THERAPY IN TREATMENT OF PRIMARY KNEE OSTEOARTHRITIS IN BACH MAI HOSPITAL - HANOI, VIETNAM

SUMMARY

Objective: Evaluate the effectiveness and side effects of intra-articular MD-knee injection therapy in the treatment of primary knee osteoarthritis.

Objects and methods: Prospective randomized longitudinal clinical trial on 60 patients with primary knee osteoarthritis, diagnosed by ACR-1991 criteria. The first group of 30 patients was treated with intraarticular injections two vials (4 mL) of MD-Knee/time/week x 5 consecutive weeks. The second group of 30 patients, treated with intraarticular injection one vial (2,5 mL) of GO-ON/time/week x 5 consecutive weeks. The two groups were assessed by using VAS, measure of knee motion angle, Lequesne scale, WOMAC, recording the side effects before (T0) and after treatment T2 (2 weeks), T4 (4 weeks), T8 (8 weeks), T12 (12 weeks).

Results: The effectiveness of pain improvement and motor function of MD Knee group on VAS, Lequesne and WOMAC scales was noticeable 4 weeks after injection and continued for up to 12 weeks.

The difference was not statistically significant compared to the group using GO-ON (p> 0.05). The best treatment effect is after 3 months: The 30% improvement rate on VAS scale is 86.7%. The average VAS score decreased by 85.2%. The 50% improvement rate on WOMAC scale is 86.7%. The overall WOMAC score averages decreased by 81.2%. The average Lequesne score decreased by 91.1%. The percentage of obvious improvement in knee range of movement is 43.3%.

The only side effect was: local tension (13.3%). The percentage of patients who were very satisfied and satisfied with the treatment was 93.3%.

Conclusions: Intra-articular MD-Knee injection therapy relieves pain and improves motor function in the treatment of primary osteoarthritis.

KEY WORDS

PRIMARY KNEE OSTEOARTHRITIS, COLLAGEN THERAPY, INTRAARTICULAR INJECTION, MD-KNEE, SODIUM HYALURONATE

INTRODUCTION

According to the WHO in 2013, osteoarthritis accounted for 10-15% of the population over 60 years of age, causing disability for 10 million women and 6.5 million men each year (1).

In Vietnam, the rate of knee osteoarthritis accounted for 56.5% of all osteoarthritis patients hospilalized in Bach Mai Hospital - Hanoi, Vietnam (2).

However, current treatments have many limitations and have not completely controlled knee osteoarthritis.

Since 2010 collagen injection therapy has been used in the treatment of degenerative diseases of the musculoskeletal Apparatus.

Reshkova *et* Al. (3), Nestorova *et* Al. (4) and Boshnakov (5) demonstrate that MD-Knee intra-articular injection therapy combined with MD-Muscle periarticular injection in the treatment of osteoarthritis has analgesic effect, improve the patient's motor function and quality of life.

In 2016, Martin-Martin *et* Al. demonstrated similar efficacy of MD-Knee and sodium hyaluronate (HA) intra-articular injection therapy in patients with knee osteoarthritis (6).

– In Vietnam, there has been no research on the effectiveness of using collagen in the treatment of primary knee osteoarthritis. Therefore, we conducted this study to evaluate the effects of intra-

TAB. 1

30% improvement rate of VAS compared to T0.

Time	T2 n	T2 %	T4 n	T4 %	T8 n	T8 %	T12 n	T12 %	p
MD-Knee group (n=30)	5	16.7	14	46.7	19	63.3	26	86.7	>0.05
GO-ON group (n=30)	7	23.3	12	40	21	70	25	83.3	
p*	>0.05		>0.05		>0.05		>0.05		

p (MD-Knee vs GO-ON). p* (T2, T4, T8, T12 vs T0).

articular **MD-Knee** injection in the treatment of primary knee osteoarthritis at the Rheumatology Department of Bach Mai Hospital - Hanoi, Vietnam.

PATIENTS AND METHODS OF THE STUDY

Patients

60 patients with primary knee osteoarthritis, diagnosed according to ACR 1991 criteria, treated in the Rheumatology Department of Bach Mai Hospital, from October 2018 to October 2019.

Patients had VAS score of 4 cm or higher, at stages 2 and 3 according to the Kellgren and Lawrence classifications, without synovial effusion. Exclusion criteria: bacterial infection, severe chronic disease, taking NSAIDs in the last 7 days or intraarticular corticosteroid injection in the last month, HA injection in the last 6 months.

– The patients were divided into 2 groups. The group, consisting of **30** patients who were injected with MD-Knee intra-articularly 4ml/time/week for 5 consecutive weeks, each injection 1 week apart.

The control group consisted of **30** patients who were injected with hyaluronic acid (GO-ON) intra-articularly injection with 2.5 ml/time/week for 5 consecutive weeks, 1 week apart.

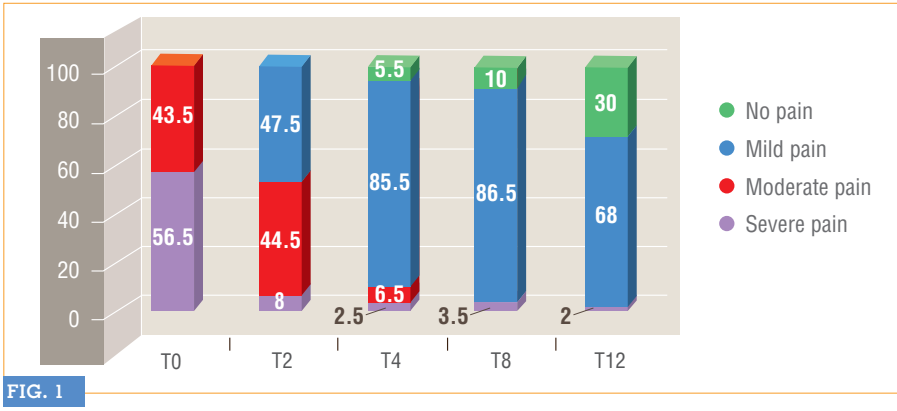


FIG. 1

VAS scale in MD-Knee group.

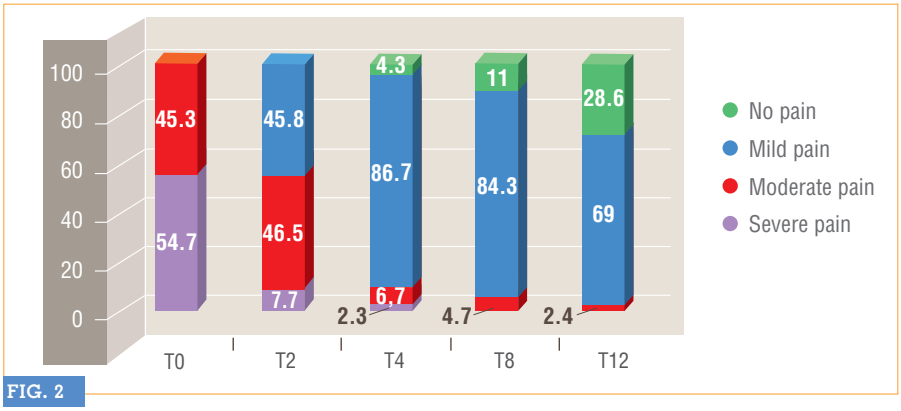


FIG. 2

VAS scale in GO-ON group.

Methods

Prospective, randomized, longitudinal clinical trial. It was assessed/measured: VAS index, measure of knee movement angle, Lequesne scale, WOMAC, sides effects before **(T0)** and after treatment at 2 weeks **(T2)**, 4 weeks **(T4)**, 8 weeks **(T8)** and 12 weeks **(T12)**.

Analysis and data processing was made using by SPSS 20.0 statistical software.

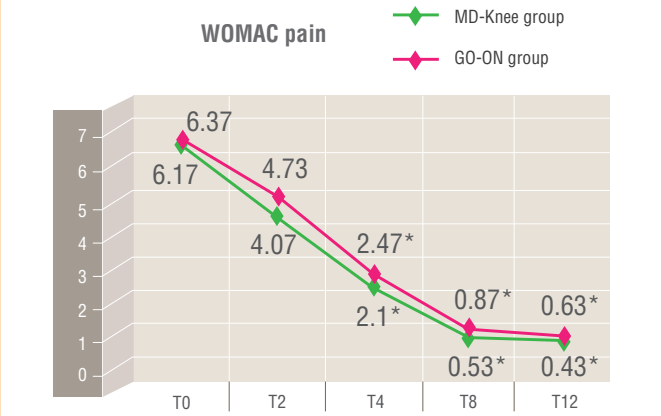
RESULTS

Demographic characteristics of the patients

MD-Knee patients had an average age of 59.07 ± 10.9, 53.3% in the age group 40-59, F 86.7%, manual workers 56.7 %, obesity rate 63.3%.

The average duration of osteoarthritis in MD-Knee group was 5.8 ± 5.5 years, the prevalence rate from 1-5 years was 36.7%.

– There was no difference in age, gender, occupation and body mass index (BMI) between MD-Knee and GO-ON ($p > 0.05$).



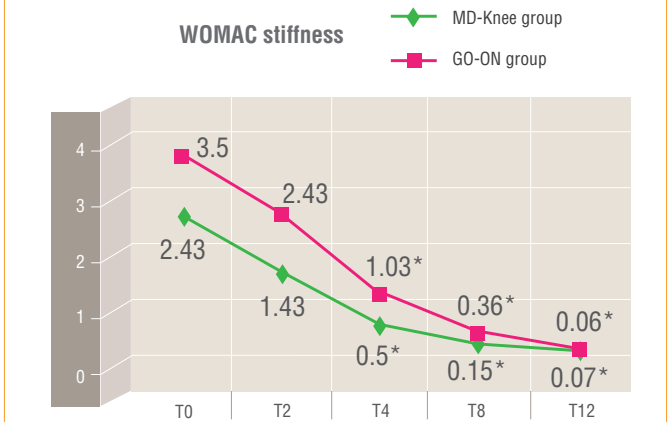


FIG. 3

Results of treatment under WOMAC pain and WOMAC stiffness of MD-Knee and GO-ON groups. p (T2, T4, T8, T12 vs T0). *: p < 0,05.

Result of treatment of MD-Knee intra articular injection therapy

– Results of treatment on a VAS scale

The MD-Knee group got an improved 30%; after 2 weeks the VAS score was 16.7% and after 12 weeks 86.7%; this improvement was statistically non significant compared to the GO-ON group (p > 0.05). There has not been a correlation between demographic factors and clinical symptoms to the rate of improvement 30% of the VAS score at the time of 12 weeks after treatment (p > 0.05). The improvement of the average VAS score of the patients with stages 2 and 3 knee osteoarthritis on X-ray all began to make sense from week 2, and continued in the subsequent weeks. The difference is not statistically significant between the 2 phases (p > 0.05). The incidence of severe pain and moderate pain in the MD-Knee group at the time T0 respectively 56.5% and 43.5%, after 2 weeks down to 8% and 44.5%, dropped to 0% and 2% in week 12. There are no statistically significant differences with the GO-ON group (p > 0.05) (TAB. 1; FIGG. 1, 2).

– Results of treatment on a WOMAC scale

The average general WOMAC point at T0 was 32.87 ± 3.19 to the time T12 was reduced to 5.20 ± 4.48 (reduced 81.2%). Symptoms of pain, stiffness, movement on the WOMAC scale begin to decline from T4 extending to T12. The difference between the times T4, T8, T12 versus T0 is statistically significant (p < 0.05). The rate of severe and moderate pain level in MD-Knee group at time T0 were 56.5% and 43.5%, after 2 weeks, it was reduced to 8% and 44.5%, to 0% and 2 % at 12 weeks. There was no statistically significant difference compared to the GO-ON group (p > 0.05). In both the MD-Knee and GO-ON groups, the improvement of the WOMAC pain and stiffness became important from the 4th week after treatment and extended to the 12th week (p < 0.05). There are no statistically significant differences between the 2 groups (p > 0.05). In 2 subgroups with stage 2, 3 Kellgren and Lawrence classification of patients with MD-Knee and GO-ON, WOMAC scale (pain, stiffness, joint mobility and WOMAC total) began to improve markedly from the 4th week, lasting until the 12th week. The improvement of 50% of WOMAC general score at times was the same between 2 Xray stages and between 2 treatment groups (p > 0.05) (TAB. 2; FIGG. 3, 4).

Time	T2		T4		T8		T12		p
	MD-Knee	GO-ON	MD-Knee	GO-ON	MD-Knee	GO-ON	MD-Knee	GO-ON	
2nd stage	4/19	8/23	8/19	11/23	14/19	18/23	17/19	20/23	>0,05
	21.0%	34.7%	42.1%	47.8%	73.6%	78.2%	89.4%	86.9%	
3rd stage	2/11	2/7	5/11	3/7	8/11	5/7	9/11	5/7	
	18.1%	28.5%	45.4%	42.8%	72.7%	71.4%	81.8%	71.4%	
p*	>0.05		>0.05		>0.05		>0.05		

p (2nd stage vs 3rd stage). p* (T2, T4, T8, T12 vs T0).

TAB. 2

Rate of improvement 50% of general WOMAC in diferents Xray stages of MD-Knee and GO-ON groups.

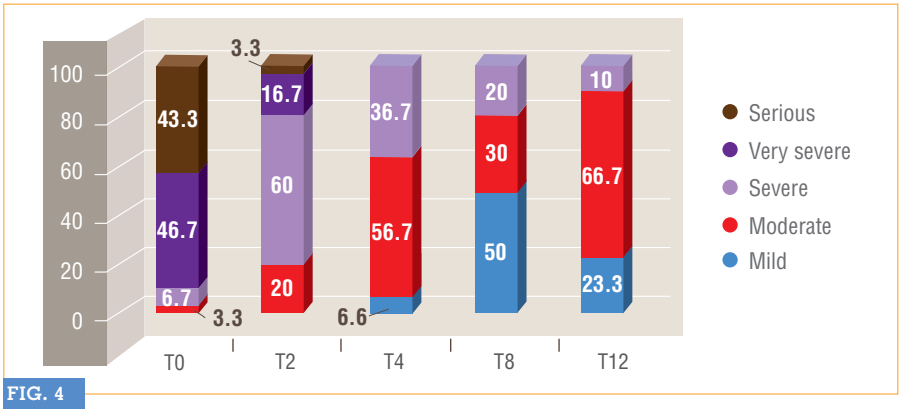


FIG. 4

Degree of knee joint damage on the Lequesne scale in MD-Knee group.

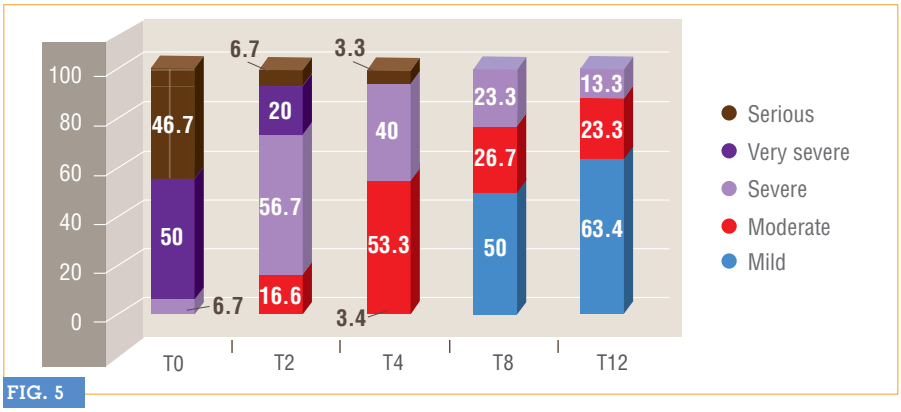


FIG. 5

Degree of knee joint damage on the Lequesne scale in GO-ON group.

– Results of treatment on a Lequesne scale

The rate of very severe in the MD-Knee group at T0 was 46.7% and 50% in the GO-ON group; after 2 weeks the rate was reduced to 6.7% and 20%, and further decreased in subsequent weeks. After the 12th week the level of severe and very severe is 0%. There is no difference between the 2 groups ($p > 0.05$) (FIGG. 4, 5).

– Results of the treatment on knee motor function

The rate of improvement of the knee-folding amplitude of the MD-Knee group at the time of T2 was 6.7% and at time of T12 was 43.3%. There has not been a correlation between demographic factors and clinical symptoms to the rate of improvement of the knee-folding amplitude at the time of 12 weeks following treatment ($p > 0.05$).
The rate of improvement in two MD-Knee and GO-ON groups were not statistically significant ($p > 0.05$).

– The rate of post-treatment patient's satisfaction after 3 months

The rate of satisfied and very satisfied patients in the MD-Knee group was 33.3% and 60% after 3 months of treatment respectively. There is no difference between the 2 groups ($p > 0.05$).

– Side effects

The only undesirable effect was tightness in the knee joints after injection (3.3%).

DISCUSSION

Assessing effectiveness on the VAS scale

In the MD-Knee group the pain level is markedly improved after 2 injections ($p < 0.05$), with an average VAS score decreasing to 3.77 versus T0. The improvement of the VAS scale is maintained, until week 8 and week 12. The 30% improvement rate of VAS, at T2 in the MD-Knee group was 16.7%, and 86.7% at T12.

This suggests that the analgesic effect lasts up to week 12 in the MD-Knee group.

The pain reduction was fast, strong, and lasting equally in both MD-Knee and GO-ON groups. Martin-Martin *et* Al. (6) using MD Knee in the treatment of knee osteoarthritis also showed an improvement in the average VAS pain scale; pretreatment was 7.5 and after 3 months of treatment was 5.26. Reshkova evaluated the efficacy of MD-Knee intraarticular injection and MD-Muscle pariarticular injection in 30 patients with knee osteoarthritis stage 2-3.
The author *et* Al. also showed a pronounced reduction in VAS average points: 7.32 before treatment, 4.32 after 2 months and 3 after 3 months of treatment.

These results are similar in comparison to our results. Nestorova *et* Al. (4) review ed the efficacy of MD-Knee and MD-Matrix IA injections on 25 patients with knee osteoarthritis even at later stages (phase 3,4) and showed a pronounced improvement in pain and motor indicators after 2 months and 3 months.
The VAS scale improvement in our GO-ON group was equivalent to the result of Pho, studying 151 knee osteoarthritis patients (7).

Evaluating the effectiveness of treatment on the WOMAC scale

The scores of WOMAC pain, stiffness, mobility and total were improved on MD-Knee group starting from the second week, markedly from the 4th week, until to T12. The improvement was similar to the GO-ON group.

Evaluating the effectiveness of treatment on the Lequesne scale

The Lequesne scale begins to improve in both MD-Knee and GO-ON groups from week 2, significantly from week 4 and continuously until the 12th week after treatment. The difference between the two groups is not statistically significant ($p > 0.05$).

The Lequesne scale improvement observed in two subgroups with 2 and 3 Xray stages and lasts up to 12 weeks.

The results of our research on GO-ON group were similar to Martin-Martin *et* Al. (6) (2016) and to Pho (7) studies.

CONCLUSIONS

MD-Knee intraarticular therapy has analgesic effect and improves motor function in the treatment of the primary knee osteoarthritis.

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