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Case Report

Management of Knee Osteoarthritis (KOA) with Integrative Therapy: A Case Report

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Abstract

Knee osteoarthritis (KOA) is a serious public health concern and is described as a disorder characterised by degradation of articular cartilage, bone remodeling and inflammation, leading to pain, stiffness and functional impairment, primarily affecting weight bearing joints and hands. KOA affects more than 650 million individuals worldwide and is a leading cause of disability. In India, 28.7% of adults ≥ 40 years of age and 45.5% of adults ≥ 60 years of age have KOA. The annual incidence rate of KOA in India is 2.4%. The management of KOA involves a comprehensive approach, including non-pharmacological management, pharmacological management, surgical management, alternative therapies and lifestyle changes. By combining these management strategies, individuals with KOA can effectively reduce pain, improve function, and enhance their quality of life. We present the case of a 55-year-old female patient with bilateral KOA, who presented to Department of Regimenal therapies, National Institute of Unani Medicine, Bengaluru. The patient had taken NSAIDs and other measures intermittently for pain management from last 3 years. The symptoms have worsened from last 2 months despite taking medicines. The patient was assessed and examined clinically prior to intervention. The patient underwent treatment for 30 days with integrative therapy comprising of pharmacotherapy coupled with regimenal therapy. Prior and post intervention, the patient was assessed using multiple objective parameters. The patient reported amelioration of symptoms, which was also reflected by assessment parameters post intervention. The study found that integrative approach can be effective treatment for KOA.

Keywords: KOA, Integrative therapy, NSAIDs, Regimenal therapy.

INTRODUCTION

Knee osteoarthritis (KOA) is a common chronic debilitating disease that imparts a substantial socioeconomic burden to society and healthcare systems.[1] The condition is characterized by joint pain, functional impairment and significant reduction in quality of life.[2] Knee osteoarthritis is the most common joint disease and a major cause of functional limitation and pain in adults.[3] KOA affects more than 650 million individuals worldwide and is a leading cause of disability.[4] The prevalence of knee OA has dramatically risen in recent decades due to consistent increase in life expectancy and obesity worldwide. The estimated prevalence of KOA is around 23.9% in the general adult population.[5] KOA being a degenerative disease, leads to loss of articular cartilage, bone remodeling (osteophyte formation), subchondral sclerosis and subchondral cysts. Articular cartilage is a shock-absorbent connective tissue that provides a smooth surface to minimize friction upon joint movement. The above changes lead to joint dysfunction and hence pain worsened upon activity, stiffness and loss of function. However, more recent studies have shown that the pathogenesis is much more complex with metabolic and inflammatory aspects to it.[6,7] As far as the management of KOA is concerned, it is generally divided into conservative (non-operative) and surgical (operative) measures. Conservative management broadly compromises pharmacological and non-pharmacological options and is conventionally the first line treatment to avoid or delay the need for surgical management.[8,9,10]It includes Patient education, physical exercise, and weight loss (for overweight or obese individuals). However, less than 40% of patients with

knee OA receive this kind of intervention.[11] In Unani system of medicine, KOA comes within the domain of *Waja-ul-Mafasil, which* is an Arabic term which denotes pain in joints, especially the joints of upper or lower limbs. According to the joint involved, they are named as *Waja-ul-Katif* (shoulder pain) *Waja-ul-Miraq* (elbow pain), *Waja-ul-Khasira* (hip pain), *Waja-ul-Kaab* (ankle pain), *Waja-ur-Rukbah* (knee pain), *Waja-uz-Zahr* (low backache) etc.[12,13] Joints are more susceptible organs to get accumulated with morbid matters owing to their spacious structure, cold and dry temperament (*Barid Yabis Mizaj),* low metabolic rate etc.The most common etiological factor responsible for the development of *Waja-ul-Mafasil* is raw phlegm *(Balgham-e-Kham)* produced due to inappropriate metabolism (*Gair Tibbi Istihala).* Thus, the morbid material collected in the joint spaces is not eliminated properly, which gradually affects the joints and thereby produces pressure and inflammatory symptoms like pain, stiffness, swelling, redness, etc. Keeping etiology in mind, Unani physicians have been successfully managing KOA using the principles of *Izalae Sabab* (removal of cause) and *Tadeele mizaj* (correction of temperament) with various drugs having properties such as *Musakkin* (analgesic), *Muhallil* (resolvent), *Qabiz* (astringent), *Raade* (Repellent), *Murakhkhi* (local relaxant) *Mukhaddir* (anaesthetics), *Munawwim* (hypnotics) and regimes such as *Hijama* (Cupping), *Irsal-e-Alaq* (Leech Therapy), *Fasd* (Venesection/Phlebotomy),[14] *Natūl* (Irrigation),[15,16] *Dalk* (Massage) with myriads of oils like *Roghan-e-Baboona, Roghan-e-Dhatura, Roghane-Surkh, Roghan-e-Suranjan, Roghan-e-Gule Aak, Roghan-e-Malkangni, Roghan-e-Haft-Barg, Roghan-e-Kuchla, Roghan-e-Hina, Roghan-e-Zanjabeel, Roghan-e-Shibbat,*[17,18,19] *Takmeed* (Fomentation),[20] *Zimad* (Paste), *Riyazat* (Exercise), *Hammam,*[21,22] *etc.* We present a case of KOA with a poor response to NSAIDs and other therapeutic measures. We combined unani pharmacological therapy with regimenal therapy (massage therapy and steam fomentation) to provide a safe and effective early treatment option.

CASE REPORT

A 55-year-old female, who presented to Department of Regimenal therapies, National Institute of Unani Medicine, Bengaluru with complaints of progressive bilateral knee pain since 5 years. The patient had history of bilateral knee OA. The patient had taken NSAIDs intermittently for pain management for 3 years however from last 2 months, symptoms have worsened and patient felt more stiffness in the morning and complaints of exaggeration of pain while walking for more than 20 minutes and standing continuously for more than 30 minutes. The pain was intermittent throbbing and dull in nature, present around both the knees. Pain in right knee was more than pain in left knee. The patient had radiographs which indicated osteoarthritis in both knees. Radiographs showed Kellgren and Lawrence (KL)[23] grading 2 in left knee joint and KL grading 3 in right knee joint. Patient expressed the main concern of pain in the bilateral knee. Crepitus was heard in both knees. Tests and assessments were performed at baseline and post intervention to determine the intensity of pain, knee joint range of motion and manual muscle strength. After obtaining informed consent, the patient underwent clinical assessment using multiple assessment parameters like Numerical pain level scale (NPRS),[24] Active Range of Motion (AROM)[25] and Manual Muscle Test[26] prior to the intervention at baseline V_0. The patient was asked to rate his knee pain on NPRS scale, where 0 indicates no pain at all and 10 indicates extreme pain. The patient had NPRS score of 08/10 and 04/10 in right and left knee joint respectively as shown in Table 1. As far as the Active Range of Motion(AROM) is concerned, there was lack of knee extension as shown in Table 2. The Oxford Muscle Scale was used to quantify the power or strength of muscles wherein measurement is scored on a 0 to 5 scale, with 5 representing maximal strength. The MMT scores are shown in Table 3. The assessment was done at baseline (V_0) and after completion of integrative therapy (V_1), i.e., on the 28th day.

TABLE 1: Showing NPRS Score at V_0 (Baseline).

NPRS	Score at V_0
Right knee	08/10
Left knee	04/10

TABLE 2: Showing AROM Score at V_0 (Baseline).

AROM	Range of Motion at V_0
Right Knee Flexion	110˚
Left Knee Flexion	120˚
Right Knee Extension	-5˚
Left Knee Extension	-3˚

TABLE 3: Showing MMT Score at V_0 (Baseline).

MMT	MMT score at V_0
Right Hip Extension	5
Left Hip Extension	5
Right Hip Abduction	5
Left Hip Abduction	5
Right Knee Flexion	4
Left Knee Flexion	4
Right Knee Extension	4
Left Knee Extension	4

METHOD OF PREPARATION OF OIL USED FOR MASSAGE:

Oil of *Celastrus paniculatus Wild* (*Roghan e Malkangni*) was prepared as per guidelines of NFUM (National Formulary of Unani Medicine). Crude fresh *Celastrus paniculatus* seeds were collected from the local market

and oil was obtained by the process of cold pressing.[27]

Dosage: 15-20 ml of oil was used.

PROCEDURE OF REGIMENAL THERAPY:

After a detailed assessment, the patient was given the first session of massage with lukewarm oil of *Celastrus paniculatus Wild*. (*Roghan e Malkangni*) over bilateral knee joints for about 20 minutes. After massage, with the aid of an automatic electrical steam machine, steam fomentation was done over the same area for another 20 minutes, early morning with a frequency of one session per day for one month. Oil of *Celastrus paniculatus Wild* (*Roghan e Malkangni*) was prepared as per the guidelines of the NFUM from crude *Celastrus paniculatus* seeds by cold pressing process in the pharmacy of the NIUM. Unani physicians have employed this oil for many diseases, especially those, which are caused by cold temperamental humors like facial paralysis, hemiplegia, thigh pain etc.[28,29] Before and after the completion of each session, vital parameters such as blood pressure, pulse, and respiratory rate were recorded. After completion of treatment, patient reported an improvement in symptoms that was also reflected by assessment parameters post- intervention as shown in Table 4, 5, and 6.

TABLE 4: Showing NPRS Score at V_1 (Post intervention).

NPRS	Score at V_1
Right knee	05/10
Left knee	03/10

TABLE 5: Showing AROM Score at V_1(Post intervention).

AROM	Range of Motion at V_1
Right Knee Flexion	115°
Left Knee Flexion	127°
Right Knee Extension	-1°
Left Knee Extension	0°

TABLE 6: Showing MMT Score at V_1 (Post intervention).

MMT	MMT score at V_1
Right Hip Extension	5
Left Hip Extension	5
Right Hip Abduction	5
Left Hip Abduction	5
Right Knee Flexion	4
Left Knee Flexion	5
Right Knee Extension	4
Left Knee Extension	5

DISCUSSION

Unani System of Medicine is Graeco-Arabic medicine found by Hippocrates and Galen and refined by Arabian and Persian doctors such as Rhazes (*al Razi*) and Avicenna (*Ibn-e-Sina*), *Al-Zahrawi*, and *Ibn Nafis* throughout the Middle Ages. *Buqrat* (460-377 BC), also known as Hippocrates, was a descendant of Aesculapius and is regarded as the "Father of Unani Medicine"[30,31]

In Unani System of Medicine, diseases are thought to disrupt the body's normal temperament and humor equilibrium. So Regimenal therapy (Ilaj bit Tadbeer) and pharmacology (Ilaj bil-Dawa) have been used since ancient times with the intention of restoring humor equilibrium and correcting aberrant temperament. This study is the first documented case to show the impact of integrative therapy, coupling pharmacotherapy with regimenal therapy in the management of KOA. The oral medication prescribed was *Habbe Suranjan* owing to its anti-inflammatory and antioxidant properties[32]. Unani physicians have been prescribing this medication for arthalgia from time immemorial.[33,34,35] The patient was advised to take two tablets twice daily after food for 30 days. The tablet was manufactured in the pharmacy of NIUM as per National Formulary of Unani Medicine (NFUM) guidelines. The ingredients and composition of *Habbe Suranjan*[36,37] are listed in Table 7. The ingredients possess analgesic and anti-inflammatory properties [33,34,35].

TABLE 7: Showing Ingredients of *Habbe Suranjan*

Ingredients	Composition	Dose
Suranjan Shireen	*Colchicum autumnale*	80g
Turbud	*Ipomoea turpethum*	95g
Aelwa/ Sibr	*Aloe barbadensis*	35g
Habb- al-Neel	*Ipomea hederacea*	35g
Gugul / Muqil	*Commiphora mukul*	15g
Mastagi	*Pistacia lentiscus*	15g
Tukhm soya /Shibt	*Anethum sowa*	35g

In Regimenal therapy, patient was given massage, 20 minutes daily over bilateral knee joint with lukewarm *Roghan e malkangni* for 30 days, followed by steam fomentation for 15 minutes. At the time of recruitment, the patient was in pain and was not able to walk or stand for prolonged time. After intervention, the inflammation subsided and patient felt relief in pain and stiffness. The patient reported amelioration of symptoms and an improvement in assessment scores. The assessment scores depicted a significant difference before and after treatment as shown in Figures A, B and C below.

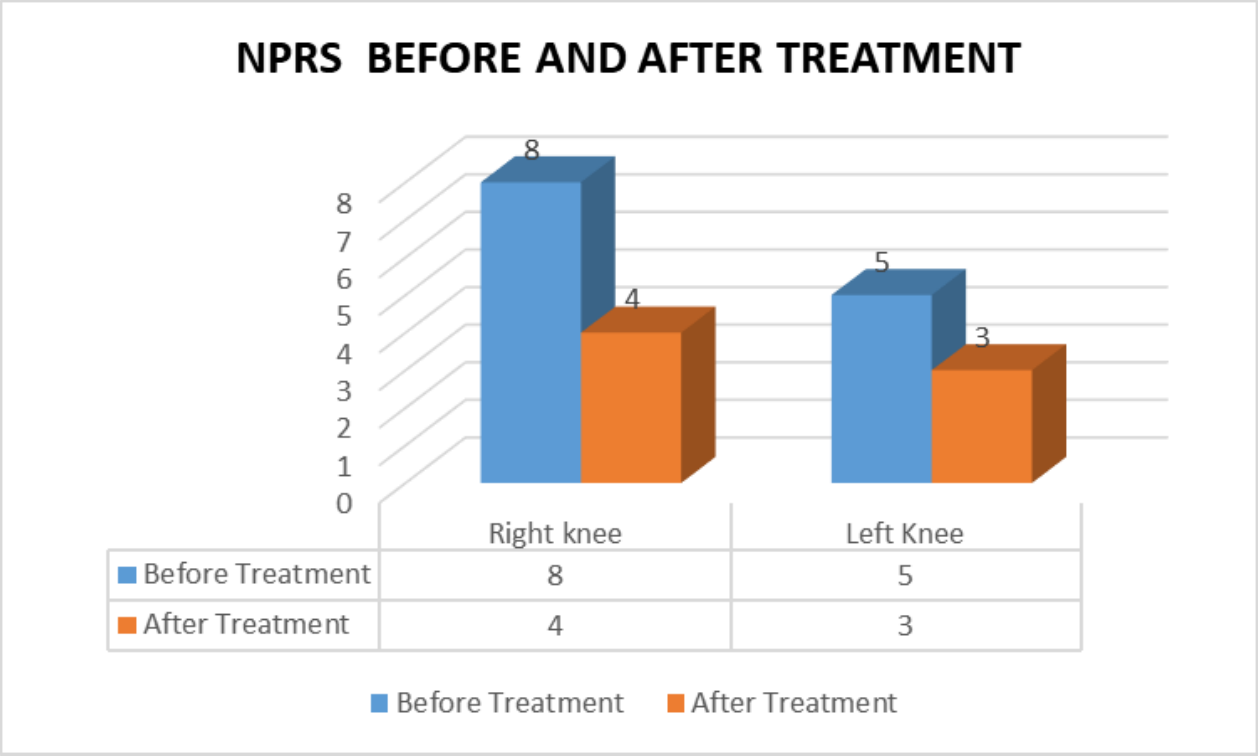

Figure A: Bar diagram showing NPRS scores before and after treatment.

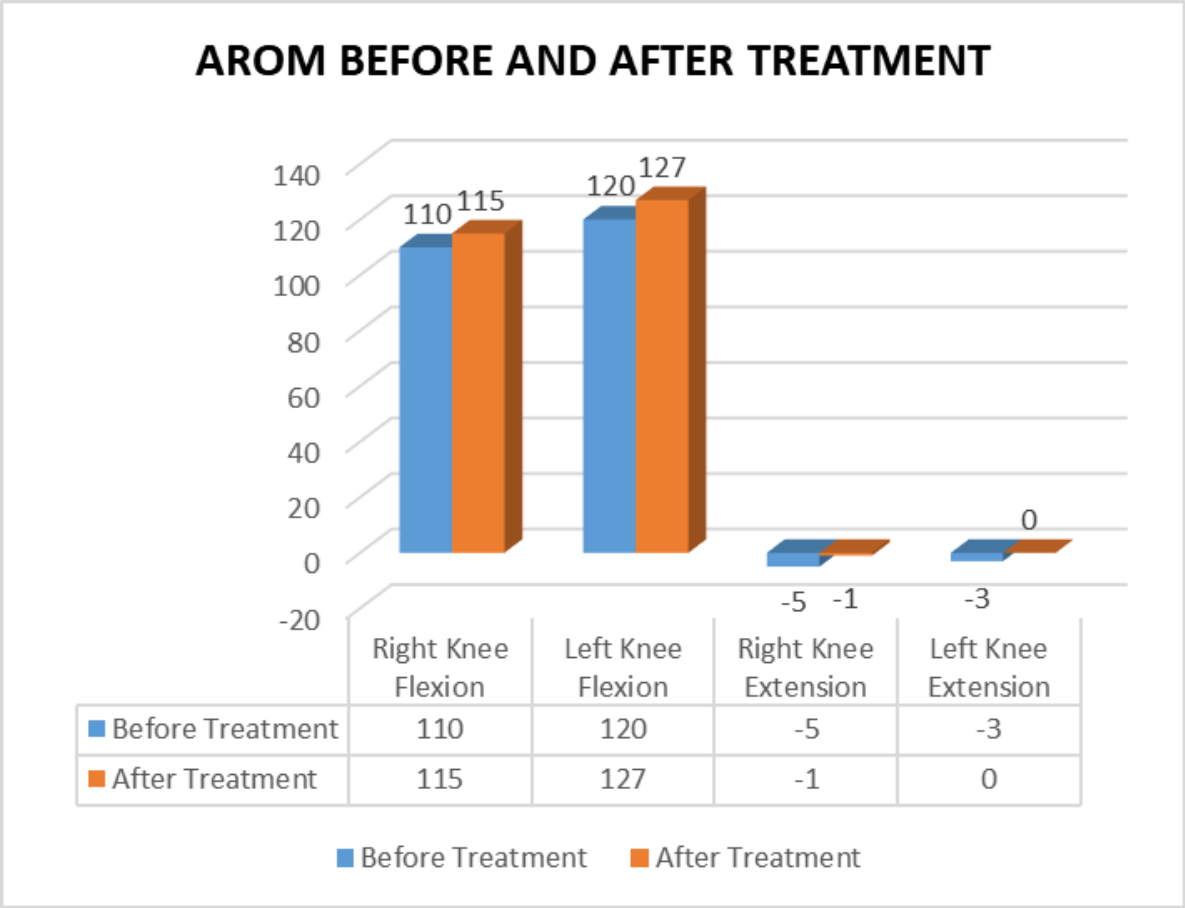

Figure B: Bar diagram showing degrees of AROM before and after treatment.

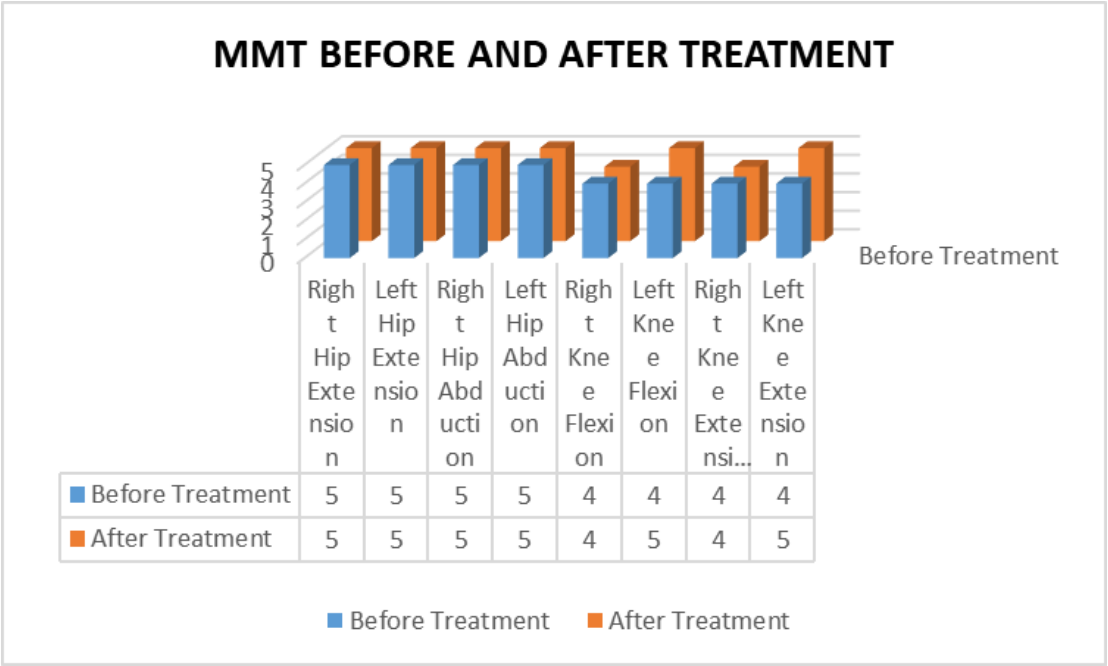

Figure C: Bar diagram showing MMT scores before and after treatment.

The case study results indicate that integrative therapy has potential anti-inflammatory and analgesic benefits and can be employed for KOA. The soothing effect offered by integrative therapy may be attributed to the anti-inflammatory and analgesic properties of the *Habbe suranjan* and *Roghan e malkangni.*[33,34,35.] Massage (*Dalk*) and steam therapy further helped in relieving of symptoms by increasing blood flow and reducing inflammation[38], relaxation of surrounding muscles and reducing muscle spasm[39,40], release of pain-relieving chemicals, such as endorphins and opioids[41] , reducing nerve sensitivity and pain transmission[42,43] and improving joint mobility and reducing stiffness.[44] This case report shows that an integrative approach involving pharmacotherapy and regimenal therapy can improve symptoms of KOA.

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Ethical Clearance

This study is approved from Institutional Ethical Committee for Biomedical Research.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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