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Case Report

Management of Knee Osteoarthritis with integrative approach using Regimenal therapy (Massage and Medicated Steam Fomentation) and Pharmacotherapy (*Habb-e -Muqil*): A Case Study

Shaik Adeena Parveen [1]*, Uzair Yousf Mir [1], Safia Abbasi[1], Mohd Nayab[2], Abdul Azeez[2], Abdul Nasir Ansari[3]

PG Scholar[1], Department of Regimenal Therapies, NIUM, Bengaluru, Karnataka, India

Associate Professor[2], Department of Regimenal Therapies, NIUM, Bengaluru, Karnataka, India

Professor and Head[3], Department of Regimenal Therapies, NIUM, Bengaluru, Karnataka, India

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*Address for Correspondence:

Shaik Adeena Parveen, PG Scholar, Department of Regimenal Therapies, NIUM, Bengaluru, Karnataka, India

Abstract

Osteoarthritis (OA) is the most common progressive musculoskeletal disorder, that is characterized by pathological changes in cartilage, bone, synovium, ligament, muscle, and periarticular fat, leading to joint dysfunction, pain, stiffness, functional limitation, and loss of day to day life activities. It affects an estimated more than 240 million people worldwide. It can involve almost any joint but typically affects the hands, knees, hips, and feet. 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, and surgical management. In Unani medicine, KOA comes within the domain of a broader term, "W*aja-ul-Mafasil"*, which refers to joint pain. It occurs due to quantitative and qualitative derangement of *Akhlat* (humors) and derangement of optimal temperament *(Mizaj)*. We present the case of a 48 year old male patient, who was presented to the OPD of Regimenal therapies at National Institute of Unani Medicine, Bengaluru. Patient complains of bilateral knee pain, stiffness, limited mobility and difficulty in daily activities since 3 years. Pain exaggerates on walking for more than 50 minutes and standing continuously for more than 30 minutes. The patient was assessed and examined clinically prior to intervention and was diagnosed with bilateral KOA, which was further accentuated by radiological investigations. The patient received treatment for 6 weeks. The patient was assessed using multiple assessment parameters at baseline, 3rd and 6th week. The patient reported improvement in both subjective and objective parameters. The study found that massage therapy and steam fomentation along with pharmacotherapy can be an effective approach in treatment for KOA, however it merits further research.

Keywords: Osteoarthritis, joint pain, bilateral knee pain, stiffness, limited mobility

INTRODUCTION

Osteoarthritis is a chronic degenerative joint disease demonstrating articular cartilage damage and leading to disabling pain and joint dysfunction.[1] Clinically, osteoarthritis is characterized by pain, typically with gradual onset that worsens over time, swollen joint caused by synovitis, morning stiffness, crackling bone, muscle atrophy, narrowing of the intra-articular space, osteophyte formation, subchondral bone sclerosis and cyst formation.[2] Osteoarthritis of the knee is a multifactorial disease, whose etiology includes generalized systemic disease (e.g., gout, rheumatoid arthritis), constitutional factors (e.g., age, gender and genetics) and also biomechanical factors (e.g., joint damage, muscle weakness, overweight and obesity)[3]. The higher incidence and severity in females is related to hormonal status. Fluctuations of sex hormone levels in young females and loss of ovarian sex hormone production due to menopause in older ones contribute to the observed differences in gender prevalence.[4,5] Osteoarthritis (OA) of the knee is the most common arthropathy of the knee.[6] It is the fourth leading cause of years lived with disability.[7,8] The American College of Rheumatology criteria (ACR) have been in use since 1981 for the clinical diagnosis of OA. The EULAR 2009 (The European League against Rheumatism) criteria were developed for the clinical diagnosis of OA in a primary care setting. OA of the knee is more common in women. It is also more prevalent among those engaged in agriculture, manual labor (men) and household work (women).[9] The prevalence of KOA in India is estimated to be around 28.7%[10], with a higher prevalence among women (31.6%) and the elderly (54.1%).[11] A study conducted in the adult rural population reported a prevalence of 5.8% ,[12] while another study found a prevalence of 17% and 5.6% in the adult population, and 54.1% and 16.4% in the elderly, based on ACR and

EULAR 2009 criteria, respectively.[13] It affects an estimated more than 240 million people worldwide.In Unani medicine, Osteoarthritis is being literally termed as W*aja-ul-Mafasil* .The term *Waja-ul-Mafasil* consists of two terms, where "*Waja*" stands for pain and "*Mafasil*" means joint.[14] *Waja-ur-Rukba* (Knee Osteoarthritis) is considered a type of *Waja-ul-Mafasil* (Osteoarthritis) which has been described by eminent Unani physicians like *Buqrat* (Hippocrates), *Jalinoos* (Galen), *Rabban Tabri, Majusi , Razi* and *Ibn Sina*. They stated that, *Waja - ul-Mafasil* (Osteoarthritis) occurs due to quantitative and qualitative derangement of *Akhlat* (humors).[15] *Zakariya Razi* stated that root cause of production of pain in joint is due to accumulation of abnormal humors inside the joint spaces which are formed from abnormal chyme.[16]

According to Unani system of medicine the predisposing factors of osteoarthritis include simple derangement of temperament without the involvement of matter (*Sue Mizaj Saada)* or derangement of temperament on account of the involvement of matter (*Sue Mizaj Maddi)* due to accumulation of *Ghair tabayi Akhlat* (abnormal humor), which could be due to *Damvi* (sanguine), or *Safravi* (choleric), or *Balghami* (phlegmatic), or *saudavi khilt*(melancholic humor), or a mixture of any two *Ghair tabayi Akhlat*.[17] Osteoarthritis is empirically treated with NSAIDs, Aspirin, Colchicines, Cox-2 inhibitors, intra-articular steroids or with Surgical intervention in conventional medicine, but owing to limited effective-eness, and toxicities associated with these drugs, the utilization is often limited, leaving many facing surgery or chronic, often debilitating, pain, muscle weakness, lack of stamina, and loss of function.[18] Eminent Unani physicians have been treating *Waja-ul-Mafasil* since ancient times with various medicines along with myriads of regimenal therapies, like *Dalk* (massage), *Fasd* (venesection), *Takmid* (fomentation), *Irsal-e-Alaq* (leeching), *Hijama* (cupping) etc. They have left behind a long list of medicines both for oral and local use in the form of pills and tablets i.e., *Habb* (pills) *(Habb-e-Suranjan, Habb-e-Gul-e-Aakh); Qurs*(tablets) *(Qurs-e-Mafasil);Majoon (Majoon Suranjan, Majoon Chob Chini, Majoon Ushba); Roghan*(oils) *(Roghan-e-Surkh, Roghan-e-Haft Barg, Roghan-e-Baboona, Roghan-e-Shibbat, Roghan-e-Malkangni; Zimad*(ointments)*(Zimad Rahat, Zimad Nana)* etc.,[19] From the above enumerated regimens, *Dalk* (massage) followed by *Takmid* (fomentation),is one of the most popular and widely used techniques, which is believed to provide relief to the patient of *Waja- ur-Rukba* by evacuating the *Mawad-i-Fasida* (morbid matters).[20] The rising prevalence of KOA in India can be attributed to various factors, including increasing life expectancy, urbanization, and changes in lifestyle and diet. This has resulted in a growing need for effective management and treatment strategies to mitigate the impact of KOA on quality of life and productivity.

CASE PRESENTATION

A 48-year-old male patient was presented to OPD of Regimenal therapies at National Institute of Unani Medicine, Bengaluru with complaints of bilateral knee pain, stiffness, limited mobility and difficulty in daily activities since 3 years. He had history of bilateral knee OA. Pain increased on walking for more than 50 minutes and standing continuously for more than 30 minutes. The pain was intermittent, throbbing and dull present around both the knees. Pain in right knee was more than pain in left knee. On physical examination patient had an Antalgic gait with mild swelling and tenderness around both the knees. X-ray revealed osteoarthritis in both knees, showing KL (Kellgren -Lawrence) grading 2 in left knee joint and KL grading 3 in right knee joint.[21] Osteophytes and reduced joint spaces were seen in both knee joints.

As per patient, the main concern was bilateral knee pain, which was limiting his day to day life activities. Tests and assessments were performed prior to intervention to determine the knee joint range of motion, severity of pain, level of stiffness and ability to perform daily activities. Crepitus was heard in right knee on passive knee flexion. Baseline investigations included Complete Haemogram, LFT (AST, ALT, Alkaline Phosphatase), KFT (Blood Urea, Sr. Creatinine), and RBS.

INTERVENTION

The patient underwent Massage therapy sessions (20 minutes) with *Roghan e Haft Barg* followed by *Takmid Har Ratab* (Hot and moist steam fomentation) for 10 minutes with a decoction of some Unani drugs, having *Muhallil* (anti-inflammatory) and *Musakkin* (analgesic) properties such as *Babuna* (*Matricaria chamomilla*), *Nakhuna (Astragalus homosus)*, 3 times a week, for 6 weeks focusing on:

- Soft tissue mobilization
- Deep tissue massage
- Joint mobilization

Along with regimenal therapy, patient was prescribed an oral drug, *Habb e Muqil,* 2 tablets to be taken twice daily for 6 weeks. All the medicines were prepared in the pharmacy of National Institute of Unani Medicine, Bengaluru, as per guidelines of NFUM (National Formulary of Unani Medicine)

Ingredients of *Habb -e- Muqil* [22,23]

Unani Name	Botanical Name	Quantity
1. Muqil	*Commiphora mukul*	85g
2.Post-Halela Zard	*Terminalia chebula*	60g
3.Post-e-Halela Kabli	*Terminalia chebula*	60g
4.Halela Siyah	*Terminalia chebula*	60g

Ingredients of *Roghan-e-Haft Barg* [22,23]

Unani Name	Botanical Name	Quantity
1.Aab-e-Barg-e-Aak	*Calotropis gigantean*	1 kg
2.Aab-e-Barg-e-Bakayin	*Melia azedarach*	1 kg
3.Aab-e-Barg-e-Bedanjeer	*Ricinus communis*	1 kg
4.Aab-e-Barg-e-Dhatura	*Datura stramonium*	1 kg
5.Aab-e-Barg-e-Sambhalu	*Vitex negundo*	1 kg
6.Aab-e-Barg-e-Sahajana	*Moringa oleifera*	1 kg
7.Aab-e-Barg-e-Thuhar	*Euphorbia neriifolia*	1 kg
8.Roghan-e-Kunjad	*Sesamum indicum*	6 kg

OUTCOME MEASURES

Assessments were made at Baseline, 3rd week, and 6th week using:

- Visual Analog Scale (VAS) for pain
- Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) for stiffness and functional ability.
- Active Range of Motion

RESULTS

Visual Analog Scale (VAS)

The patient was asked to rate his knee pain on VAS scale at the Baseline, 3rd week and on 6th week as shown in Table 1. The VAS scale is used for assessment of severity of pain , where 0 indicates no pain at all and 10 indicates extreme pain which requires immediate medical attention.

Table 1: Showing VAS Scores at Baseline, 3rd and 6th week

Visual Analog Scale (VAS) scores for pain			
	Baseline	3rd Week	6th Week
Rt Knee	6/10	4/10	2/10
Lt Knee	5/10	4/10	2/10

WOMAC Scale

The WOMAC consists of three subscales: Pain (five questions), Stiffness (two questions), and Physical function (17 questions). The subscale scores can vary, with pain ranging from 0 to 20 points; stiffness, 0 to 8 points; and physical function, 0 to 68 points. A total WOMAC score is created by summing the items for all three subscales. (0-96). Higher scores on the WOMAC indicate worse pain, stiffness, and functional limitations. Table 2 shows WOMAC Scores at Baseline, 3rd and 6th week.

Table 2: Showing WOMAC Scores at Baseline, 3rd and 6th week

WOMAC Scale Scores			
	Baseline	3rd Week	6th Week
Rt Knee	50	38	25
Lt Knee	46	35	22

Active Range of Motion

The patient had lack of knee extension as shown in Table 3. Therefore achieving complete knee extension could improve his gait and decrease pain associated with walking and standing activities.

Table 3: Showing AROM Scores in degree at Baseline, 3rd and 6th week

Active Joint Range of Motion in Degrees				
		Baseline	3rd Week	6th Week
Knee Flexion	Rt	110°	112°	115°
	Lt	120°	122°	125°
Knee Extension	Rt	-5°	-4°	-3°
	Lt	-3°	-2°	-2°

DISCUSSION

While knee OA progression differs from patient to patient, exploration of the progression of the therapies that decrease pain should be continued.[24] The lifetime risk of symptomatic knee OA is almost 1 in 2 for those with a knee injury history and almost 2 in 3 for obese people. Mechanical factors such as obesity contribute substantial to OA aetiopathogenesis.[25] This case report demonstrates the potential benefits of Massage therapy and Steam fomentation along with pharmacotherapy in managing knee OA symptoms. Massage may:

- Reduce pain and stiffness
- Improve functional ability
- Enhance quality of life

Massage is theorized to work through a variety of mechanisms. Increased blood circulation to the muscles promoting gas exchange and delivery of nutrients and removal of waste products has long been thought to be one of the outcomes and benefits of massage, and recent studies support this effect.[18] According to Unani System of Medicine, *Dalk* (Massage therapy) dissolves and removes *Akhlat-e-fasida* (morbid humours), liquefies the *Rutubat-e-badan* (body fluids), produces heat (*Latif Hararat*) in the body which removes *baroodat* (coldness) and dissolve *reehi-mawad* (gas) and strengthens the muscles, ligaments and tendons. It is helpful in evacuation and diversion of adhered viscous morbid matter accumulated inside the joints that alleviate the pain, reduces swelling, excretes waste product (*fuzlat-e-badaniya*) that is formed at the end stage of digestion (*hazm-e-akhir*).[26] *Takmid* (fomentation) is believed to provide relief to the patient of *Waja-ur-Rakba* by evacuating the *Mawad-I Fasida* (morbid matters). *Takmid* (fomentation) involves applying heat either moist or dry and cold (by ice) on joints to improve the symptoms of osteoarthritis and it can be done with packs, towels soaked in decoction of drugs and also the application of warm wax etc.[27] Heat may work by improving circulation and relaxing muscles, while cold may numb the pain, decrease swelling, constrict blood vessels and block nerve impulses to the joint. [28] In this case *Takmid Har Ratab* (hot and moist fomentation) was under taken with a decoction of some Unani drugs, which are having *Muhallil* (anti-inflammatory) and *Musakkin* (analgesic) properties such as *Babuna (Matricaria chamomilla), Nakhuna(Astragalus homosus)*.[27] The Unani formulation *Habb-e-Muqil* and *Roghan-e-Haft Barg* have analgesic, anti-inflammatory, muscles relaxant and purgative properties which help in alleviating pain. After intervention, the patient reported an improvement in assessment parameters. Fig A, B and C depicts relative improvement of VAS, WOMAC and AROM scores respectively at Baseline, 3 rd and 6th week.

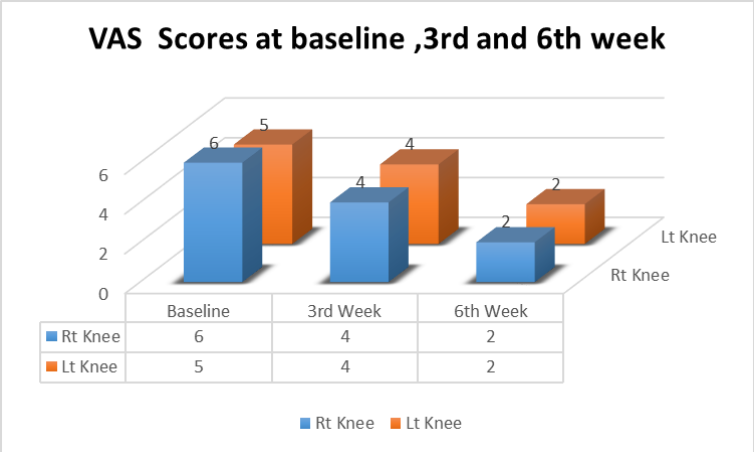

Figure A: Showing VAS Scores at Baseline, 3rd and 6th week

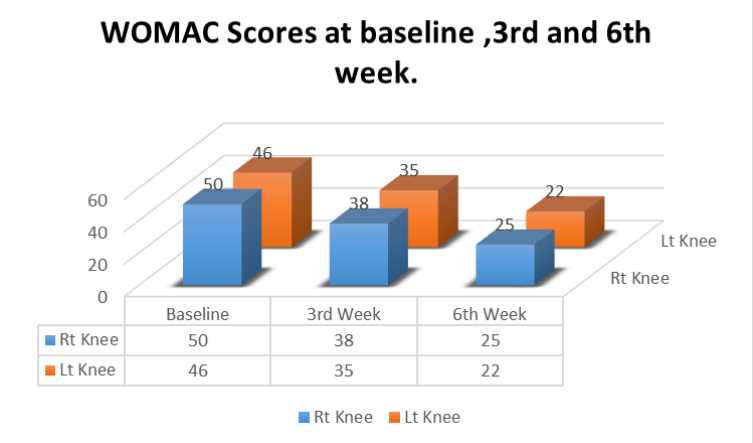

Figure B: Showing WOMAC Scores at Baseline, 3rd and 6th week

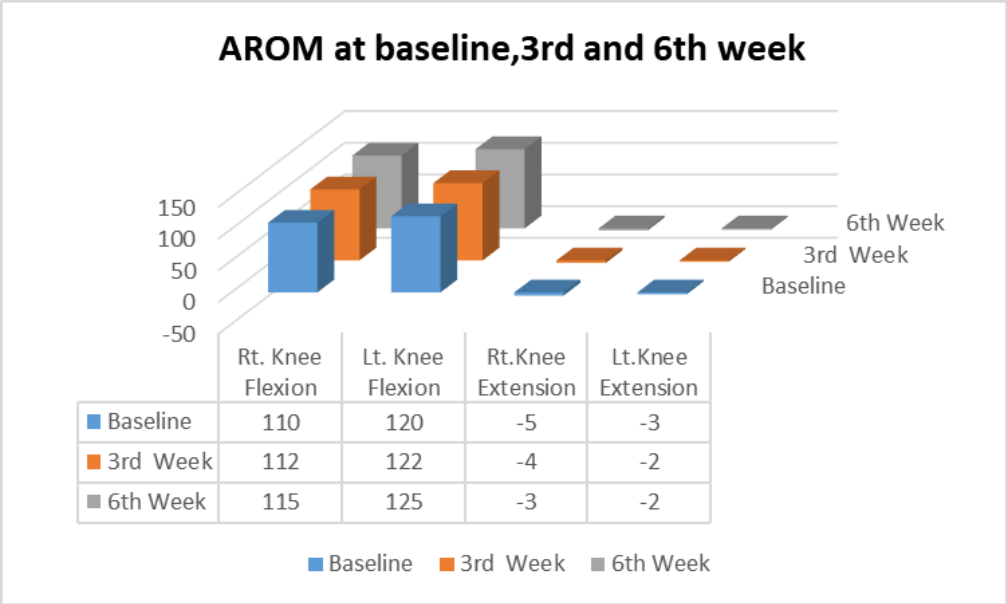

Figure C: Showing AROM Scores in degree at Baseline, 3rd and 6th week

CONCLUSION

Massage and Steam fomentation therapy may be a valuable adjunctive treatment for knee OA management. The treatment approach focuses on restoring the normal temperament, regulate the *Khilt* (humor) imbalance through *Imala* (diversion of morbid material) and *Istifraagh* (evacuation of morbid material) and to minimize morbidity and impairment. Such goals are achieved effectively by integrating both non-pharmacological and pharmacological treatment approaches. This case study intervention is effective in ameliorating the symptoms of knee osteoarthritis and reduced the burden of OA. Further research is warranted to explore its effectiveness in larger populations.

Adverse Drug Reaction Documentation

No adverse effect of the drug was reported

Limitations

- Single case report
- Short-term follow-up
- Lack of control group

Funding and Conflict of Interest

Nil

Ethical Clearance

This study is approved from Institutional Ethical Committee for Biomedical Research

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