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Case Report

Effect of *Zimad* (Unani pharmacopeial liniment) in the management of Knee osteoarthritis (KOA): A case study

S. Mussadiq Ahmed [1], Prof. Dr. C. Mushtaq Ahmed,[2] Dr. Mubasheera Begum [3*], Nusrath Tasneem [4]

1. PG Scholar Department of Moalajat, GUMC. Chennai. Tamil Nadu. India.

2. Prof and HOD Department of Moalajat, GUMC. Chennai. Tamil Nadu. India

3. Assistant Professor, Department of Moalajat, GUMC. Chennai. Tamil Nadu. India.

4. PG Scholar Department of Moalajat, GUMC, Chennai. Tamil Nadu. India.

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*For Correspondence:

Dr. Mubasheera Begum, Prof and HOD Department of Moalajat, GUMC, Chennai. TamilNadu.India.

Abstract

Knee Osteoarthritis (Knee OA) is the most common Musculoskeletal disorder, which causes functional disability, thus increasing the economic burden in society. Conventional medicine uses NSAIDs, COX inhibitors, and steroids, which provide only symptomatic relief. In Unani medicine, Osteoarthritis is treated with variety of regimens and drugs. Among these regimens Zimad (liniments) prepared with number of single Unani pharmacopeial drugs exerts anti-inflammatory, analgesic and anti-arthritic actions. Keeping this in mind a case study was conducted to assess the efficacy of Zimad containing drugs including *Zard Chob*, *Darhald*, *Maida Lakdi*, Wheat flour, *Methi* and *Sibr* in the management of Knee OA for 14 sittings of daily application for 2 weeks. A female patient with chief complaints of pain in the right knee joint, along with swelling, joint stiffness , mild tenderness, and severe pain while performing daily activities for the last 8 months was treated at the IPD of ARINGAR ANNA GOVT HOSPITAL OF INDIAN MEDICINE & HOMOEOPATHY, UNANI IPD, Chennai, Tamil Nadu. The patient was assessed at baseline, 7th day and 14th day on the basis of changes in subjective and objective parameters. At the end of the treatment, the patient got significant relief in subjective (pain, joint stiffness, and ROM) and objective parameters (VAS and WOMAC). The present study reveals that *Zimad* is safe and effective in the treatment of Knee OA without any side effect. Therefore, further randomized clinical studies need to be carried out to validate the effectiveness of *Zimad* in the management of Knee OA.

Keywords: Knee osteoarthritis, *Waja' al-Rukba*, *Zimad*, Unani pharmacopeial liniment

1. Introduction

Osteoarthritis (OA) is a significant cause of impairment in the elderly due to its high incidence rate, particularly in relation to weight-bearing functional tasks of diarthrodial joints. The most frequent kind of Osteoarthritis is Knee Osteoarthritis. According to various sources, 13% of women and 10% of men aged 60 and above experience symptomatic knee osteoarthritis. When a person is above 70, the frequency rises to 40%. Men are less prone than women to have osteoarthritis of the knee [1]. Based on the etiology of the illness, OA is divided into its idiopathic (primary) and secondary variants. There are no systemic side effects associated with the illness, but clinical symptoms include joint pain and discomfort, mobility restriction, joint stiffness, joint swelling, crepitus and occasional joint effusion[2]. *Waja' al-Rukba* (Knee osteoarthritis) is described under the heading of *"Waja' al-Mafasil"*in the *Unani* classical literature which is composed of two words *Waja* means pain and *Rukba* means knee joint. A famous *Unani* physician named *Ali ibne Abbas Majoosi* claims that the etiology of this illness is extremely obscure and complex. As a result, it is impossible to identify the precise cause of the sickness. It was later stated that the condition is caused by the spread of vitiated materials (*Maddah*) and the weakness of the joints, which allows them to accept the *Maddah.* The author of *Al-Qanoon*, *Ibne Sina*, stated that psychological factors and emotional moods are significant contributors to the development of this illness. He also claimed that the *Maddah* (vitiated matter) that causes *Waja' al-Mafasil* almost resembles pus but is actually not pus. While *Samarqandi*, a distinguished *Unani* physician, asserts that the sickness is caused by a *Maddah* that is particularly thick and white in colour[3].

In conventional medicine, a wide range of pharmacological and non-pharmacological therapies are used to treat Osteoarthritis. In patients with chronic pain who have seen an unsatisfactory response to non-pharmacological therapy, pharmacological treatment with non-steroidal anti-inflammatory medications (NSAIDs) is often regarded as the first-line therapy with or without adjuvant therapy[4]. The most effective drugs

used in the management of acute pain are NSAIDs[5,6]. Dyspepsia or vomiting to more serious injuries such as gastro duodenal ulceration, bleeding, and gastrointestinal lesions are among the GI system side effects associated with the use of NSAIDs[7]. Additionally, several investigations have shown evidence of hepatotoxicity and liver damage[8, 9, 10]. Cardiovascular problems, peripheral edema, and hyperkalemia are additional risks, especially for diabetics and the elderly [11, 12]. In addition to being extremely expensive, other therapeutic modalities including surgical interventions etc. are also linked to more serious, irreversible consequences. Therefore, there is increased interest in complementary medications and therapies that have been used for ages to treat pain and inflammation with least or no side effects [13]. Unani Medicine is a traditional form of medicine that focuses on the prevention and treatment of a wide range of acute and chronic ailments. The four primary treatment modalities used in Unani medicine are *Ilaj Bil Ghiza*, *Ilaj Bit Tadbeer*, *Ilaj Bid Dawa*, and *Ilaj Bil Yad*. *Ilaj Bit Tadbeer* is one of the fundamental forms of treatment in the Unani medical system[14]. Numerous interventions are mentioned in the important treatises and manuscripts for the management of *Waja' al- Rukba* that were written by eminent Unani academics and physicians, such as *Hijamah* (cupping therapy), *Dalk* (massage therapy), *Zimad* (liniments), *Riyazat* (exercise) etc[15]. *Zimad* (liniments) is local application of semisolid medicated preparation of single pharmacopeial drugs over body surface.[16] Significant analgesic, anti-inflammatory, decongestant, antioxidant and anti-arthritic drugs are used in the preparation of *Zimad* are mentioned for the preparation of *Zimad* in the management of osteoarthritis in the Unani treatises. A famous Unani Scholar and physician *Hakeem kabiruddin* recommended drugs such as *Zard Choob, Darhald, Maida Lakdi, Wheat flour, Methi and Sibr* in his book *Bayaz e Kabir* [17].

2. Materials and Methods:

A 61-years-old female patient came to the UNANI OPD of ARINGAR ANNA GOVT HOSPITAL OF INDIAN MEDICINE & HOMOEOPATHY, Chennai. Tamilnadu. Patient was admitted in IP Female Ward (III) Unani (IP: NO-273/13) on 09/05/2024 with the complaints of pain and swelling in Right knee joint with difficulty in standing and walking from last 9 months. Patient was unable to perform her daily physical activity. On general examination her vitals were within normal limits and no abnormality was detected through systemic examination. On palpation of Right knee joint crepitus, tenderness and moderate swelling was present. There was restriction of flexion and extension during examination of range of motion of Right knee joint. X-Ray of Right knee joint Anterior-posterior and Lateral view revealed mild narrowing of medial compartment of tibio-femoral joint space with osteophytes on tibial spine, these findings were suggestive of Kellgren-Lawrence Grade 2 knee osteoarthritis. Based on above findings it was diagnosed as *Waja' al- Rukba* (Knee osteoarthritis).

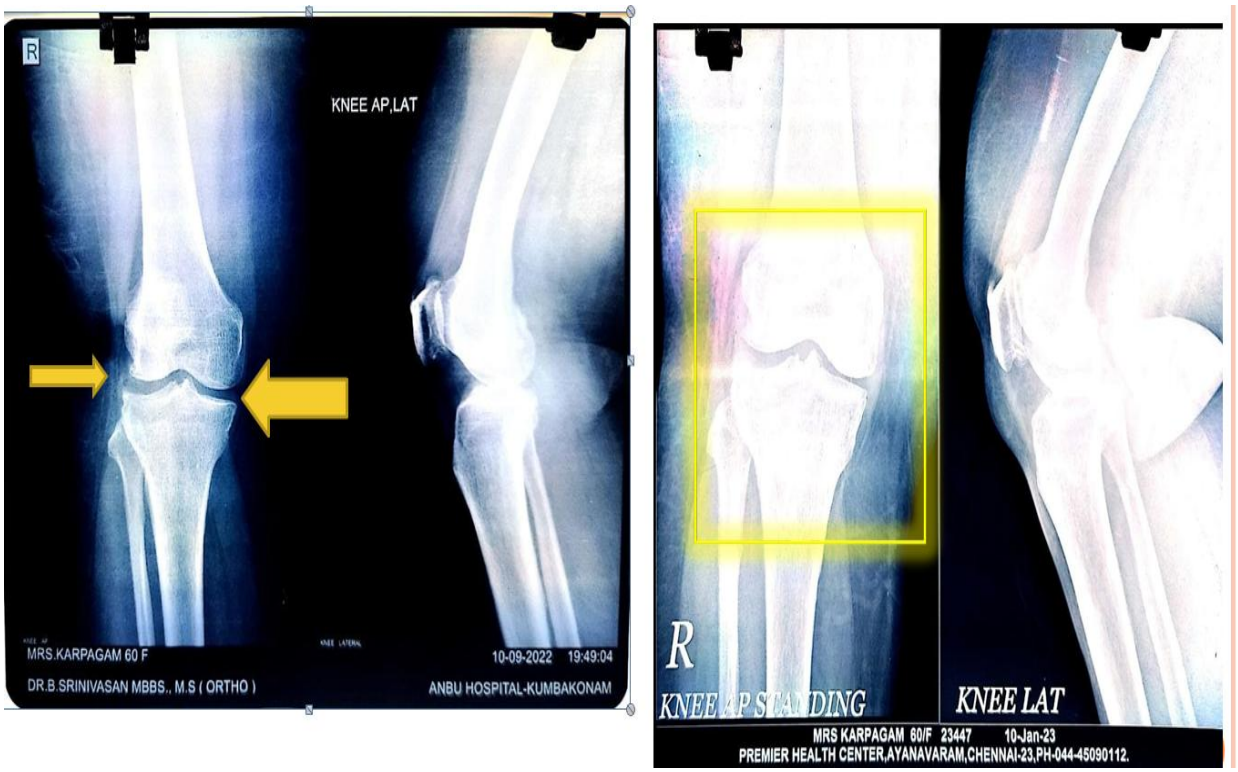

Figure 1: A - X-ray Rt Knee Joint

Figure 2: Before treatment RT Knee joint

Figure 3: Applying of Zimad

2.1. Drug preparation and Mode of Administration:

Zimad (*Zard Chob, Darhald, Maida Lakdi, Wheat flour, Methi and Sibr*) was prepared in the ANNA HOSPITAL PHARMACY as per the guidelines of Anna Hospital Pharmacopia. *Zimad* (semisolid paste) applied locally over the anterior surface of Right knee joint for 14 sittings of daily application for about 2 weeks. Information about ethnopharmacological properties of ingredients of drugs used for *Zimad* is listed in table1.

Botanical Name	Unani Name	Therapeutically active constituents	Effects as per Unani Medicine	Associated pharmacological activity
Curcuma longa	*Zard chob*	Coumaric, caffeic acid, sinapic acid, quercetin-3-D-galactoside, casuarinin, and isohammetin[18]	*Muhallil*(anti-inflammatory), *Musakkin* (analgesic)	Antioxidant,Anti-inflammatory, Anti osteoarthritis, Neuro protective[18]
Berberis aristata	*Darhald*	Protoberberine and bisisoquinolineberbamine, Berberine, oxycanthine, epiberberine, palmatine[19]	*Muhallil-e-Waram* (anti-inflammatory) *Muqawwi-i-Asab* (nervine tonic) *Musakkin* (analgesic)[25]	Analgesic,Anesthetic,Anti pyretic, Anti-inflammatory, Anti-oxidant, [19]
Litsea glutinosa	*Maida Lakdi*	Oleic acid ,Eicosanoids PhytoestrogensTestosterone, Pyrrolidinone , Piperidine Pyridine ,coumarin[20]	*Muhallil*(anti-inflammatory), *Musakkin* (analgesic)[26]	Analgesic, Anti-inflammatory, Anti-oxidant, Anti-bacterial, Osteoprotective,[20]
Triticum aestivum	*Wheat flour*	phenolic acids, alkylresorcinols, lignans, and diverse antioxidant compounds such as carotenoids, tocopherols and tocotrienols	*Muhallil-e-Waram* (anti-inflammatory) *Muqawwi-i-Asab* (nervine tonic) *Musakkin* (analgesic)[27]	Anti-inflammatory, Anti-oxidant

Trigonella foenum graecum	*Methi*	Steroidal sapogenins, isoleucine, and galactomannans.[21]	*Muhallil-e-Waram* (anti-inflammatory) *Muqawwi-i-Asab* (nervine tonic) *Musakkin* (analgesic)[28]	Anti-inflammatory, Anti-oxidant [28]
Aloe vera	*Sibr*	glucomannans, polymannose, and acemannan, or b-(1–4)-acetylated polymannose[22-24]	Arthritis, Rheumtism pain [29]	Anti-inflammatory, Anti-oxidant, Bone protection, [23]

3. Analysis:

The patient was assessed on baseline, 14th day and after completion of treatment i.e., on 14th day with the help of Subjective parameters i.e., Pain, joint stiffness, joint swelling and restriction of movement and Objective parameters i.e., Visual Analogue Scale (VAS) for measurement of pain and Western Ontario and McMaster Universities Arthritis Index (WOMAC) that is based on the pain intensity, intensity of joint stiffness and difficulty in ADL (daily life activities). Pain intensity score was 4 (pain is very severe at this score) at baseline which improved to 1 on the completion of the study. Joint Stiffness was 3 (stiffness is at moderate level at this score) at baseline which improved to 1 on the completion of the study. Joint Swelling was 2 (swelling is mid at this score) at baseline which improved to 0 on the completion of study. Restriction of movement of joint was 4 (ROM is severe at this score) at baseline which improved to 2 on the completion of study. The total VAS was 7 (pain is very severe at this score) at baseline which improved to 3 on the completion of the study. The total WOMAC score was 58 at baseline which improved to 22 on the completion of the study

3.1. Subjective Parameters:

SIGNS &SYMPTOMS	BASELINE	POST TREATMENT
PAIN INTENSITY	4	1
JOINT STIFFNESS	3	1
JOINT SWELLING	2	0
ROM	4	2

3.2. Objective Parameters:

OBJECTIVE PARAMETERS	BASELINE	POST TREATMENT
VAS	7	58
WOMAC	3	22

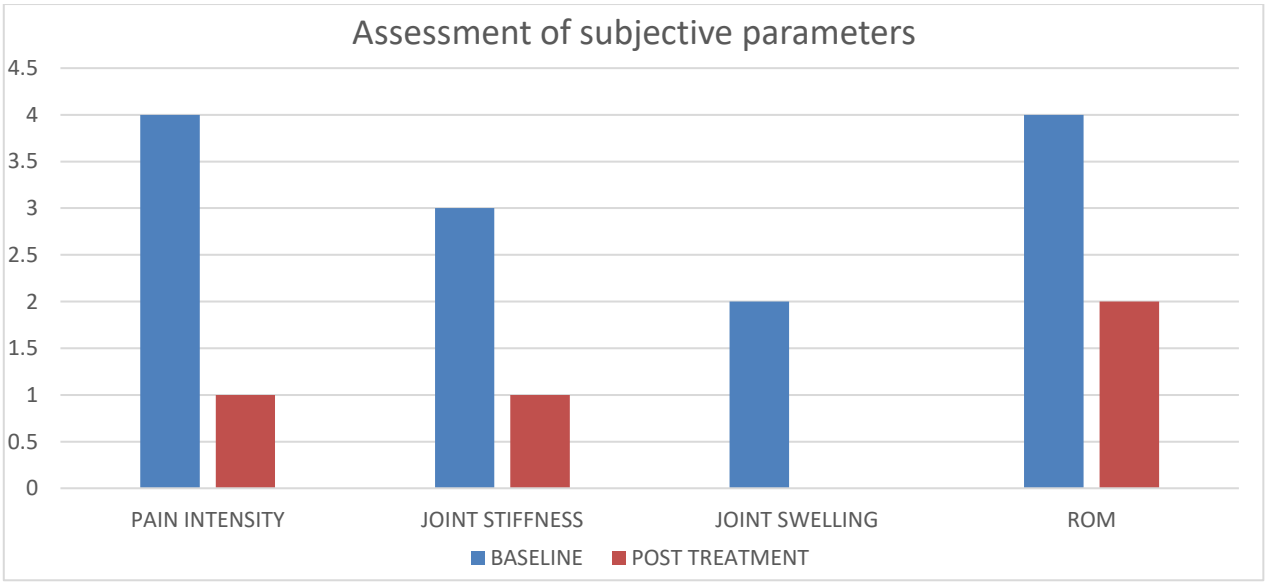

Figure 4: Assessment of subjective parameters

Follow-Ups and Post-Treatment images of the Right Knee Joint

Figure 5: 7th day follow-up

Figure 6: 14th day

4. Results:

After 2 weeks of treatment, the efficacy of *Zimad* was evaluated and found clinically significant in the management of (*Waja' al-Rukba*). The total WOMAC score was impressive as it reduced from the initial scoring of 58 to 22 at the end of the treatment. The VAS score was 7 at baseline which improved to 3 on the completion of the study. There was almost relief in the symptoms of bilateral knee joint pain, stiffness, swelling and also improvement in the quality of life.

5. Discussion:

Knee osteoarthritis *(Waja' al-Rukba)* is the most common form of osteoarthritis, often resulting in significant disability. While NSAIDs are commonly used for pain relief, they come with potential gastrointestinal, hepatic, and cardiovascular side effects. In contrast, Unani medicine offers alternative therapies like *Zimad*, a liniment with anti-inflammatory and analgesic properties, providing a promising, safer option. In this case study, *Zimad* demonstrated effectiveness in reducing pain, stiffness, and joint swelling in knee osteoarthritis patients, as evidenced by improvements in VAS and WOMAC scores. The observed benefits are attributed to the bioactive compounds in ingredients such as *Zard Chob, Darhald, Maida Lakdi, Methi, Wheat flour, and Sibr,* which have well-documented anti-inflammatory, antioxidant, and analgesic properties. Previous studies on topical herbal treatments also support the positive outcomes of this study. However, there are several limitations that must be considered. The single-case design restricts the ability to generalize the results, as they are based on only one patient. The short follow-up period of 14 days does not allow for the assessment of long-term effects or the recurrence of symptoms. Additionally, the absence of a control group makes it difficult to determine whether the improvements were due to the intervention or natural symptom fluctuation. The lack of blinded assessments introduces the potential for bias in the evaluation of subjective parameters like pain and stiffness. Furthermore, other factors such as lifestyle, concurrent treatments, or natural recovery could have contributed to the observed improvements, making it challenging to attribute the results solely to *Zimad*.To validate the findings and address these limitations, future studies should consider conducting larger Randomized Controlled Trials (RCTs) with placebo or NSAID controls, extending the follow-up period to 3–6 months to evaluate long-term effects, using blinded assessments to reduce bias, and performing multicenter studies to increase the external validity and assess the efficacy of *Zimad* across diverse patient populations.

6. Conclusion:

In this case report, it is demonstrated that the *Zimad* with anti-inflammatory and analgesic properties is quite effective in the management of knee osteoarthritis. Therefore, further randomized clinical studies need to be carried out to validate the effectiveness of *Zimad* in the management of knee osteoarthritis.

Patient perspective: For the past nine months, I have been dealing with constant pain and swelling in my right knee, making it hard to do everyday tasks. Walking, standing, and even simple movements have become difficult, especially in the mornings when my knee feels

very stiff.When I visited the hospital, the doctors examined me and took an X-ray, which showed that I have osteoarthritis. Although living with this pain has been tough, getting a proper diagnosis has given me hope. I now look forward to treatment that can help me move better and reduce my discomfort.

Informed Consent Statement: Informed consent as obtained from the subject.

Ethical compliance statement: The authors confirmed that patients provided written informed consent for the publication of the literature.

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Data availability statement: The data are available from the corresponding author on reasonable request.

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