Volume 3, Issue 1, January 2025 ISSN (E): 2938-3765

EFFECTIVENESS OF TRADITIONAL MEDICINE TREATMENTS IN OSTEOARTHRITIS OF THE KNEE JOINT

Mamadaliyeva M. A.
Pulatova Sh. B.
Tashkent Medical Academy, Tashkent, Uzbekistan

Abstract

This review delves into the effectiveness of folk remedies for treating knee osteoarthritis (KOA), a prevalent degenerative joint disease that significantly impairs quality of life, particularly among the elderly. The piece discusses various risk factors associated with KOA, including age, obesity, diet, and genetic predisposition. It highlights contemporary pharmacological approaches and traditional remedies, particularly those rooted in Chinese and Iranian medical practices.

The review emphasizes the role of traditional herbal treatments, moxibustion, and acupuncture, exploring their potential efficacy and safety profiles. It further contextualizes these remedies against the backdrop of increasing concerns regarding the side effects associated with conventional pharmacological approaches, such as NSAIDs and corticosteroids, which can lead to complications over long-term use.

Moreover, it addresses the importance of conducting rigorous scientific evaluations of these folk remedies through systematic reviews and controlled trials to establish their effectiveness and inform clinical practice. By balancing the historical use of traditional medicine with modern research methodologies, this paper aims to bridge the gap between folk remedies and contemporary medical practices, offering hope for improved management strategies for knee osteoarthritis patients.

Keywords: Knee osteoarthritis, chronic inflammation, herbal medicine, traditional Chinese medicine, NSAIDs, pain management, digital health, acupuncture, non-surgical treatment.

Introduction

Knee osteoarthritis (KOA) is a type of chronic degenerative arthritis, and its chronic inflammation is characterized by degeneration or loss of articular cartilage, articular margin, and subchondral bone regeneration. However, the etiology and pathogenesis of knee osteoarthritis were unclear. With the acceleration of the aging process in China, the incidence rate of KOA is increasing. +e methods of improving the quality of life and the living standards of patients become an urgent problem for medical workers. There is still controversy about which intervention is the best method. Currently, therapies in clinical practice include surgery and nonoperative treatment; however, the clinical effects of different individuals at different stages will still be very different. This article reviews the recent advances in the treatment of knee osteoarthritis from three aspects: nonsurgical treatment, surgical treatment, and modern new medical means.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

Currently, age, diet, trauma, obesity, and inheritance are the main risk factors for knee osteoarthritis (KOA) and knee replacement (KR). As the articular cartilage layer wears out, biomechanical changes occur in contact with the subchondral bone, along with the loss and reduction of articular fluid, which accelerates the aging process. Additionally, weight gain leads to ligament degeneration, relaxation, and muscle weakness, resulting in significant degenerative changes in articular cartilage and subchondral bone [1].

The inclusion criteria for this review comprised original studies published in English over the past 10 years, focusing on technologies utilized for rehabilitating KOA or KR. Studies addressing technology for diagnosis, decision aid, informed consent, or movement assessments were excluded. Duplicates, conference abstracts, protocol papers, and previously published reviews, including systematic reviews, were also excluded. One researcher (NS) initially screened the titles of the studies based on the specified criteria, removing irrelevant studies. The remaining studies were then reviewed by three researchers (NS, KEC, and DK) who assessed the abstracts to determine inclusion in the review. For included studies, one author (NS) extracted relevant information as applicable, including objectives, study design, intervention characteristics, outcomes, and limitations. The studies were subsequently grouped according to the applications of digital health to facilitate review organization for readers. Studies were categorized into areas such as delivering patient education, physical activity, exercise (both asynchronous and synchronous), and psychological treatments like cognitive behavioral therapy (CBT) or pain coping skills training (PCST) in the KOA and KR populations. The review also discusses findings related to cost-effectiveness and patient/clinician perspectives on digital health [2].

Current pharmacotherapy provides options for alleviating pain and symptoms of osteoarthritis (OA) and rheumatoid arthritis (RA). However, side effects associated with these treatments may limit their use. Nonsteroidal anti-inflammatory drugs (NSAIDs) are associated with gastrointestinal, cardiovascular, and nephrotoxic effects, precluding long-term use for arthritis. Acetaminophen poses risks of hepatotoxicity, while tramadol can alter gastrointestinal and central nervous system functions. Intra-articular corticosteroids may have questionable efficacy for OA treatment and can further damage joints and tissues. Hyaluronic acid injections can provide OA pain relief with reasonable safety but may be expensive. Non-biologic DMARDs are effective in early RA with low disease activity but carry risks of gastrointestinal disturbances, hepatotoxicity, nephrotoxicity, and blood disorders. Biologics are effective for moderate to severe RA but have low tolerability and increase the risk of serious infections, cancer, and heart failure. Janus kinase inhibitors to manage moderate to severe RA also carry risks of infection and blood disorders. Ultimately, physicians and patients must weigh the benefits and risks associated with pharmacological therapy. These concerns regarding safety and the costs of traditional arthritis therapies have sparked interest in natural remedies. Additionally, challenges in managing chronic pain associated with arthritis have prompted investigations into herbal therapies. Herbs may offer a complementary or alternative method for an effective and safe treatment. This review summarizes current pharmacological therapy utilized for OA and RA while providing recent findings regarding herbal arthritis management, specifically focusing on the mechanisms, safety, and efficacy (including pain and inflammatory outcomes) of select herbal medications used for OA and RA [3].

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

Osteoarthritis (OA) is the most common joint disease, occurring more frequently in males before the age of 45 and in females after 55 years of age. OA commonly affects the hands, feet, spine, and large weight-bearing joints, such as the hips and knees. When the cause of OA is unknown, it is referred to as primary osteoarthritis; when the cause is identified, it is termed secondary osteoarthritis. Cartilage changes when the dynamics of biology, biochemistry, and bone structure around it shift. In the elderly, synovial fluid involvement is most common. Pain is a significant clinical complaint. Oral and topical NSAIDs are the most commonly used to relieve pain in OA knee patients. Diclofenac has been used as an active control, demonstrating superior effects for osteoarthritis. Alternative medicine, such as acupuncture, Thai massage, sesame oil, yellow oil, and herbal medicine, has also been commonly employed for OA treatment [4].

Osteoarthritis (OA) is a prevalent chronic degenerative joint disease characterized by articular cartilage degradation, synovial inflammation, and subchondral bone lesions. The disease affects 2-6% of the global population, with prevalence rising with age, exceeding 40% in individuals over 70. OA treatment can be categorized into non-surgical (e.g., acetaminophen, NSAIDs, and hyaluronic acid) and surgical management (e.g., osteotomy, unicompartmental knee arthroplasty, and total knee arthroplasty). However, these current treatments are often accompanied by various complications, including pain, infection, and blood-related issues. Therefore, ongoing exploration for safe and effective treatments for OA is essential. Research and development progress relies on appropriate pathological models. Commonly used methods for modeling OA include surgical (e.g., Hulth technique, joint immobilization, and destabilization of the medial meniscus) and non-surgical (e.g., monosodium iodoacetate, papain, and collagenase) inductions. Model animals (e.g., mice, rats, and rabbits) and human biological samples (e.g., cartilage, peripheral blood mononuclear cells, and fibroblast-like synoviocytes) are utilized to evaluate the anti-OA mechanisms of drugs [5].

KOA has emerged as a global medical issue due to its high incidence, significant disability rate, health hazards, and economic burden. Investigating the clinical efficacy characteristics and advantages of drugs for KOA treatment is crucial for guiding rational clinical drug use. A national trial represents the first comparative study assessing the effectiveness and safety of Osteoking versus NSAIDs for treating Chinese patients with KOA. Currently, KOA pharmacotherapy mainly includes NSAIDs, glucosamine, and sodium hyaluronate injections. NSAIDs are recognized as first-line KOA medications but carry gastrointestinal and cardiovascular safety risks (Park et al., 2023). Recent evidence indicates that traditional Chinese medicine (TCM) is effective in preventing and treating KOA, improving clinical efficacy, and reducing adverse reactions (Ye et al., 2023). Notable TCM treatments include Xianling Gubao Capsule (Wu et al., 2021), Zhuanggujie Capsule (Lu et al., 2018), Jintiange Capsule (Chen Z. et al., 2023), Xiaotong Patch (Guo et al., 2021), Compound Nanxing Zhitong Paste (Wang et al., 2012), and Gutong Patch (Wang et al., 2023), all of which have been recommended in Chinese clinical guidelines (Joint Surgery Group of Chinese Medical Association, 2021; Standardization Project Team of Traditional Chinese Medicine, 2021; Orthopedics and Traumatology Branch of China, 2020; Chen et al., 2016). With a legacy spanning thousands of years, TCM has garnered attention for its notable efficacy in treating KOA. Besides therapeutic effects, TCM is characterized by fewer adverse reactions. Some studies indicate that certain traditional Chinese medicines may improve KOA

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

progression and protect joint cartilage cells (Xia et al., 2020). Osteoking comprises nine types of drugs that promote blood circulation, enrich Qi, nourish the liver and kidneys, heal bones and muscles, reduce swelling and pain, and facilitate fracture healing. It is primarily used for bone and joint diseases, femoral head necrosis, lumbar disc herniation, and fractures. Acute and long-term toxicity tests have shown no abnormal changes in various physiological indicators in animals, indicating that the preparation is safe (Supplementary Material S12–14). Based on UPLC analysis, five drug monomers were identified, including Astragaloside, Aucubin, Ginsenoside, Notoginsenoside, and Hesperidin (Xia et al., 2020). Modern research indicates that astragaloside can inhibit inflammatory factors such as IL-1β, IL-6, TNF-α, and NF-κB while improving cartilage degradation (Li et al., 2019) [6].

Knee osteoarthritis (KOA) is a degenerative osteoarthropathy that causes pain and functional limitations, primarily affecting the elderly. An epidemiological survey in China, covering 17,459 samples, revealed a prevalence of 1.5% for mild, 3.3% for moderate, and 3.9% for severe KOA. KOA imposes a significant burden on patients, health services, and society. Hence, seeking effective conservative treatments for KOA to alleviate symptoms, delay disease progression, and reduce the likelihood of knee replacement is paramount. The precise pathological mechanism of KOA remains unclear, but factors such as prior trauma, inflammation, and metabolic disorders are implicated. Various inflammatory cells reside in the synovial fluid of osteoarthritis, including cytokines (TNF, IL-1β, IL-6), growth factors (TGFβ, VEGF), and prostaglandins (PGE2), which induce matrix metalloproteinases and other hydrolase enzymes responsible for cartilage destruction, eventually leading to joint dysfunction and pain.

Patients with early to mid-stage KOA frequently receive NSAID treatment or intra-articular HA injections. HA demonstrates anti-inflammatory effects, nourishes cartilage, lubricates joints, and can partially relieve symptoms in KOA patients. Despite HA no longer being recommended in the American Academy of Orthopaedic Surgeons (AAOS) guidelines due to ambiguous clinical effects, many surgeons continue its use. TCM practices, particularly acupuncture and moxibustion, are gaining prominence in KOA treatment, demonstrating positive results. Acupoint injections, derived from acupuncture combined with modern injection techniques, involve the direct injection of drugs at acupoints, merging acupuncture stimulation with drug efficacy. Studies indicate that acupoint injections yield favorable outcomes with minimal side effects in KOA treatment, addressing pain stemming from not only joint cavity components but also fascia, ligaments, and tendon attachment points outside the joint. Some surgeons utilize intra-articular HA injections coupled with acupoint injections to address pain both within and outside the knee joint. However, there remains a lack of large-scale, multicenter evidence supported by randomized controlled trials (RCTs). Therefore, this study aims to meet these objectives through systematic reviews and meta-analysis, providing reliable clinical evidence [7].

Knee osteoarthritis (KOA) is the most common form of arthritis and significantly contributes to disability and activity limitations, particularly among elderly patients. Characterized by pain and functional restrictions, it substantially affects the quality of life. Over 20 million Americans and 35 to 40 million Europeans are expected to develop this condition within their lifespan. Recent international guidelines promote non-pharmacological care for patients with knee pain. Moxibustion, a representative non-drug intervention in traditional Chinese medicine (TCM) and a

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

form of acupuncture has shown promising results in alleviating symptoms and enhancing the quality of life for patients with KOA, as evidenced by numerous studies, including clinical trials and systematic reviews. The mechanism of moxibustion primarily relates to its thermal effects, radiation, pharmacological activity of moxa, and combustion products (volatile oils, brown tar-like substances, and moxa smoke). While moxa smoke possesses antibacterial and antiviral properties that may aid in treating diverse conditions, excessive inhalation of monoaromatic hydrocarbons, formaldehyde, and polycyclic aromatic hydrocarbons during moxibustion raises health concerns. Epidemiological studies have linked moxa smoke exposure with adverse reactions such as dry throat, dry eye, and coughing. With growing environmental awareness, there is increasing scrutiny regarding the safety of smoke produced in moxibustion. Consequently, many acupuncturists opt for smoke purification devices to mitigate moxa smoke during treatment, yet few studies have reported on the clinical efficacy disparities between conventional moxibustion and smoke-free moxibustion. Currently, we are conducting a randomized controlled clinical trial to compare the effectiveness of conventional moxibustion with that of smoke-free moxibustion in treating patients with KOA [8].

Pain is a significant symptom across various medical conditions and remains the leading cause of medical consultation. Approximately half of all drugs licensed globally between 2007 and 2021 were derived from natural products or synthetic derivatives of them. Over centuries, natural products originating from plants, animals, and microorganisms have served as treatments for human ailments. Historical medicinal knowledge has been passed down through generations. Given this context, drugs, especially those of plant origin employed in Iranian traditional medicine (ITM), present a promising area for new analgesic drug development research. A formula comprising a blend of Lawsonia inermis L. and Ricinus communis L. was selected for evaluating the reduction of knee pain, based on Persian traditional medicine texts such as Makhzan-ol Advieh, Gharabadin-e Kabir, and Tohfat al-mu'minin. These texts recommend this mixture for knee pain treatment. Osteoarthritis (OA) is a degenerative joint disease marked by joint pain and progressive loss of articular cartilage. Monosodium iodoacetate (MIA) is a chemical agent used to induce OA as a knee pain model. This model effectively replicates pathological changes and pain patterns of OA observed in humans. The subsequent joint condition is referred to as "induced MIA." Lawsonia inermis L. (Lythraceae) is utilized in treating diseases like leprosy and headaches, along with aesthetic applications such as enhancing hair and nail growth. Additionally, it exhibits anti-inflammatory, antinociceptive, and antipyretic properties. Its natural components include Lawsone (2-hydroxy-1,4-naphthoquinone), mucilage, essential oils, tannic acid, gallic acid, fats, glucose, mannitol, and resin. Ricinus communis L. (Euphorbiaceae) serves to address swelling, gout, and skin disorders. The main compounds in this plant provide anti-inflammatory and antioxidant activities. The present study aims to assess the analgesic and anti-inflammatory effects of the topical extracts of L. inermis and R. communis according to Iranian traditional medical sources [9].

Osteoarthritis (OA), also known as degenerative joint disease, is the most common form of arthritis in the United States, affecting 54.4 million, or 22.7% of the adult population.1 Of those affected, studies have reported that 22.7 million suffered from arthritis-attributable activity limitations. The economic burden associated with OA is significant and multifactorial, including costs related to

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

treatment, hospitalizations, work-related losses, and home-care costs. The knee is the most common joint affected in OA, with up to 41% involvement, compared to 30% in the hands and 19% in the hips. Knee OA, specifically, has doubled in prevalence since the mid-20th century, and has been estimated to have a lifetime direct per-person cost for symptomatic patients of $12,400. OA has also been shown to substantially decrease quality of life, with studies estimating 86 million quality-adjusted life-years lost due to knee OA alone. The pathophysiology of OA is complex, with contributing factors including mechanical stress to the joint and many person-specific factors such as genetic susceptibility, ethnicity, nutrition, and sex. Consequently, the range of treatment options for the management of knee OA is also multifaceted. Treatment methods can be classified into three major divisions: non-pharmacological, pharmacological, and interventional. Treatment modalities include weight control, exercise, non-steroidal and steroidal anti-inflammatory drugs, opioids, intra-articular platelet-rich plasma, placebo, or corticosteroid injection, intra-articular viscosupplementation, and surgery. Interventional treatments for OA are the most recent of these, with viscous implementation introduced in the late 19th century [10].

Knee braces come in many forms, including soft braces (eg, elastic sleeves, simple hinged braces) and unloading braces. Many of these braces have been purported to help with knee OA although the evidence remains mixed, with a lack of high-quality trials. A systematic review of RCTs comparing various knee braces, foot orthotics, and conservative treatment for the management of medial compartment OA concluded that the optimal choice for orthosis remains unclear, and long-term evidence is lacking. The medial unloading (valgus) knee brace is often used to treat medial compartment OA and varus malalignment of the knee by applying a valgus force, thereby reducing the load on the medial compartment. One recent systematic review concluded that medial unloading braces improve pain from medial compartment OA, but whether they improve function and stiffness is unclear. Another study showed that compared to conservative treatment alone, valgus knee bracing has some benefits in decreasing pain and improving knee function. Additionally, an 8-year prospective study found that the valgus unloading brace can delay the time before patients need to undergo knee arthroplasty. However, another prospective study examining the efficacy of valgus bracing at 2.7 years and 11.2 years showed short-term but not long-term benefits [11].

Knee osteoarthritis (OA) is a degenerative joint disease and the most common reason for knee joint replacements in the US, with 4.7 million individuals having undergone surgery in 2010 with an associated cost of USD 29,488 Per surgery. The high prevalence of knee OA manifests in enormous societal and personal expenses and urges to prevent OA progression to avoid surgery. Knowledge of a patient's risk factors helps inform them of their prognosis, and clinicians must adapt the trajectory of a patient's treatment progress to their needs to maintain functionality. Along with using medicine (e.g., acetaminophen, nonsteroidal anti-inflammatory drugs, and duloxetine), the patient's treatment starts with physical therapy (e.g., diathermy, exercise therapy, ultrasounds, knee brace, and electrical stimulation). However, the best strategy for each patient is difficult to establish because knee OA's exact causes of progression are not entirely understood. To help clinicians treat people living with knee OA and prevent knee replacement, this narrative review presents (i) the most recent updates on the pathogenesis of OA with the risk factors for developing OA and (ii) the most recent evidence for physical therapy.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

First, OA has been depicted as the result of progressive articular cartilage degradation. Indeed, although the cartilage can prevent biomechanical damage caused by severe loading, patients with OA hinder attempts at repair and result in disrupted cartilage homeostasis. For instance, cartilage cells' (i.e., chondrocytes') compositional and structural alterations—such as hypertrophy due to aging or oxidative stress—trigger the production of catabolic factors, enhancing cartilage debilitation. These catabolic factors such as cytokines, chemokines, and proteolytic enzymes—cytokines (e.g., IL-6, IL-8), chemokines (e.g., RANTES, IP-10), metalloproteases (MMP1, MMP3), and heat-shock proteins (e.g., HSPA1A)—have been identified as quantifiable biomarkers for predicting the onset and progression of knee OA. Therefore, for decades, cartilage degradation resulting from the extracellular matrix's destruction has been depicted as one of the significant biological starters of the OA pathological process. [12].

References

1. Wang H., Ma B. Healthcare and Scientific Treatment of Knee Osteoarthritis // Journal of Healthcare Engineering. – 2022. – Vol. 2022.
2. Shah N., Costello K., Mehta A., Kumar D. Applications of Digital Health Technologies in Knee Osteoarthritis: Narrative Review // 2022.
3. Lindler B.N., Long K.E., Taylor N.A., Lei W. Use of Herbal Medications for Treatment of Osteoarthritis and Rheumatoid Arthritis //2020.
4. Kakatum N., Ooraikul B., Pinsornsak P., Kanokkangsadal P., Itharat A. Efficacy and Safety of Sahastara Remedy Extract Capsule in Primary Knee Osteoarthritis: A Randomized Double-Blinded Active-Controlled Trial //2021.
5. Zhao X., Zhang S. Recent Advances in the Treatment of Osteoarthritis by Bioactive Components from Herbal Medicine //2020.
6. Zhao X., Zhang S. Recent Advances in the Treatment of Osteoarthritis by Bioactive Components from Herbal Medicine //2020.
7. Zhou X., Xiang K., Yuan X., Wang Z., Li K. A Comparison of the Effects of Acupoint Injection Combined with Hyaluronic Acid Versus Isolated Hyaluronic Acid for Knee Osteoarthritis //2020.
8. Zhu L.L., Zhou J.Y., Luo L., Wang X., Peng J.X., Chen S.S., Yin H.Y., Wu Q.F., Zhang C.S., Lv P., Tang Y., Yu S.G. Comparison of the Efficacy Between Conventional Moxibustion and Smoke-Free Moxibustion on Knee Osteoarthritis: Study Protocol of a Randomized Controlled Trial //2022.
9. Ziaei A., Sahranavard S., Gharagozlou M.J., Faizi M. Preliminary Investigation of the Effects of a Topical Mixture of Lawsonia inermis L. and Ricinus communis L. Leaves Extract in the Treatment of Osteoarthritis Using the MIA Model in Rats //2024.
10. Peck J., Slovek A., Miro P., Vij N., Traube B., Lee C., Berger A. A., Kassem H., Kaye A. D., Sherman W. F., Abd-Elsayed A. A comprehensive review of viscosupplementation in osteoarthritis of the knee // Pain Physician. – 2021. – Vol. 13, Issue 1.
11. Sprouse R. A., Harris G. D., Sprouse G. D. E. A practical approach to knee OA // Journal of Family Medicine. – September 2020.
12. Berteau J.-P. Knee pain from osteoarthritis: Pathogenesis, risk factors, and recent evidence on physical therapy interventions // Journal of Clinical Medicine. – 2022. – Vol. 11. – P. 3252. DOI: https://doi.org/10.3390/jcm11123252.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5