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EFFECTIVENESS OF TRADITIONAL MEDICINE METHODS IN KNEE JOINT OSTEOARTHRITIS

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Abstract

Among the traditional medicine approaches used in knee osteoarthritis, acupuncture is recognized as one of the most frequently applied and best-studied methods. Its analgesic effect, ability to reduce inflammatory processes, and potential to improve joint mobility have been confirmed by numerous scientific studies. Clinical observations demonstrate that acupuncture alleviates pain, reduces muscle spasms, enhances daily activity, and decreases dependence on pharmacological treatment. Its role as an adjunctive therapy, along with its safety, advantages, and capacity for integration with modern meadvantages, and capacity for integration with modern medical practices, further emphasizes the relevance of this therapeutic approach.

Keywords

knee osteoarthritis, acupuncture, traditional medicine, pain syndrome, complementary therapy, alternative medicine, joint function, inflammation reduction.

TIZZA BO‘G‘IMI OSTEOARTRITIDA XALQ TABOBATI USULLARI SAMARADORLIGI

Annotatsiya

Tizza bo‘g‘imi osteoartritida xalq tabobati yondashuvlari ichida akupunktura eng ko‘p qo‘llaniladigan va nisbatan yaxshi o‘rganilgan usullardan biri hisoblanadi. Akupunkturaning analgetik ta’siri, yallig‘lanish jarayonini kamaytirishi va bo‘g‘im harakatchanligini yaxshilashga qaratilgan mexanizmlari ko‘plab ilmiy tadqiqotlarda tasdiqlangan. Klinik kuzatuvlar bu muolajaning og‘riqni yengillashtirishi, mushak spazmlarini kamaytirishi, bemorlarning kundalik faolligini oshirishi hamda farmakologik davolashga bo‘lgan ehtiyojni qisqartirishi mumkinligini ko‘rsatadi. akupunkturaning qo‘shimcha davolash sifatidagi o‘rni, uning afzalliklari, xavfsizligi va zamonaviy tibbiyot bilan uyg‘unlashgan holda qo‘llanish imkoniyatlari mazkur mavzuning dolzarbligini yanada oshiradi.

Kalit so‘zlar

tizza osteoartriti, akupunktura, xalq tabobati, og‘riq sindromi, qo‘shimcha davolash, alternativ tibbiyot, bo‘g‘im funksiyasi, yallig‘lanishni kamaytirish.

ЭФФЕКТИВНОСТЬ МЕТОДОВ НАРОДНОЙ МЕДИЦИНЫ ПРИ ОСТЕОАРТРИТЕ КОЛЕННОГО СУСТАВА

Аннотация

Среди методов народной медицины при остеоартрите коленного сустава акупунктура считается одним из наиболее изученных и широко применяемых подходов. Ее анальгетический эффект, способность снижать воспалительные процессы и улучшать подвижность сустава подтверждены многочисленными научными исследованиями. Клинические наблюдения показывают, что акупунктура уменьшает болевой синдром, снижает мышечные спазмы, повышает ежедневную активность пациентов и позволяет уменьшить потребность в медикаментозной терапии. Значение акупунктуры как дополнительного метода лечения, ее безопасность, преимущества и возможности интеграции с современной медициной подчеркивают актуальность данного направления.

Ключевые слова

остеоартрит коленного сустава, акупунктура, народная медицина, болевой синдром, дополнительная терапия, альтернативная медицина, функция сустава, снижение воспаления

Osteoarthritis of the knee joint is one of the most widespread chronic degenerative-dystrophic pathologies among musculoskeletal diseases, characterized by the destruction of articular cartilage tissue, structural changes in the subchondral bone, and inflammatory processes [1, 3, 4]. Although this disease primarily occurs among middle-aged and elderly populations, recent years have seen an increase in its prevalence among younger population groups due to lifestyle changes, excess weight, and increased physical loads [10, 18].Clinically, knee osteoarthritis manifests as persistent or recurrent pain syndrome, joint stiffness, limited range of motion, and a decline in patients' daily life activities [2, 5]. The chronic course of the disease requires long-term treatment, which brings about not only medical but also socio-economic problems [12, 21].In modern medical practice, the treatment of knee osteoarthritis involves pharmacological agents (nonsteroidal anti-inflammatory drugs, analgesics), physiotherapeutic methods, and, in severe cases, surgical interventions [10, 18]. However, these methods have a symptomatic effect, may not fully address the pathogenesis of the disease, and can cause adverse effects and complications with long-term use [4, 19].Therefore, in recent years, interest in integrative and alternative approaches to treating knee osteoarthritis, particularly traditional medicine methods, has significantly increased [11, 12]. Traditional medicine, based on centuries of experience, stands out by being aimed at activating the body's self-repair mechanisms [13, 14].Among traditional medicine methods, acupuncture is one of the most studied and widely practiced methods for treating knee osteoarthritis. Acupuncture stimulates neuro-humoral and immune mechanisms in the body by acting on biologically active points through special needles [3, 7, 25]. Scientific research has proven that acupuncture provides an analgesic effect by reducing the transmission of pain impulses to the central nervous system and increasing the secretion of endorphins and serotonin [2, 8].Numerous clinical studies and meta-analyses published in authoritative scientific databases such as PubMed and the Cochrane Library have demonstrated that acupuncture reduces pain intensity, improves joint mobility, and improves patients' quality of life [5, 6, 9]. Some studies note that the effect of acupuncture, compared to pharmacological treatments, is associated with fewer adverse effects [1, 10].The World Health Organization (WHO) recognizes acupuncture as one of the effective alternative treatment methods that can be used for musculoskeletal diseases [12]. Nevertheless, questions regarding the clinical efficacy of acupuncture, the optimal duration of treatment courses, and its role in combination therapy still remain subjects of debate [7, 21].Although traditional medicine methods, including acupuncture, have been widely used historically in Uzbekistan and Central Asia, a systematic, scientifically-based assessment of the efficacy of these methods in knee osteoarthritis has not been sufficiently conducted [11, 13, 15]. Therefore, analyzing the existing

scientific literature and implementing it into practical medicine is a relevant scientific task [20, 22].

The main objective of this scientific article is to conduct an in-depth analysis of the clinical efficacy of acupuncture, a method of traditional medicine, in knee osteoarthritis, based on modern scientific literature [1, 2, 5].Within the scope of the research, the effect of acupuncture on pain syndrome, joint functional status, inflammatory processes, and patients' quality of life will be assessed [3, 7, 8]. Furthermore, comparing acupuncture with pharmacological and physiotherapeutic methods and determining the efficacy of combined treatment approaches are also set as goals [6, 9, 10].Based on the obtained results, it is planned to develop scientific conclusions regarding the possibilities of using acupuncture in the treatment of knee osteoarthritis, its practical significance, and for future research [12, 21, 25].

Knee osteoarthritis is a chronic degenerative-dystrophic disease with complex, multifactorial pathogenetic mechanisms, characterized not only by the destruction of articular cartilage tissue but also by changes at the level of the subchondral bone, synovial membrane, musculo-ligamentous apparatus, and the central nervous system [1, 3, 4]. Recent scientific research indicates that osteoarthritis should be viewed not merely as a "cartilage disease" but as a systemic pathological process involving the entire joint [7, 25].In the initial stages of the disease, the biomechanical stability of the articular cartilage is disrupted, and the metabolic activity of chondrocytes changes. Decreased synthesis of proteoglycans and type II collagen reduces the cartilage's ability to retain water, diminishing its elasticity and load-bearing capacity [3, 4]. As a result, microcracks appear on the cartilage surface, increasing susceptibility to mechanical damage [10, 18].One of the crucial links in the pathogenesis is the involvement of inflammatory processes activation. The release of interleukin-1β (IL-1β), tumor necrosis factor-α (TNF-α), prostaglandins, and matrix metalloproteinases by chondrocytes and synovial cells accelerates the breakdown of the cartilage matrix [2, 5]. These mediators suppress anabolic processes, leading to a deepening of degenerative processes [6, 9].As the disease progresses, pathological processes are observed in the subchondral bone. The formation of osteosclerosis, microcracks, and osteophytes disrupts the congruity of the joint surfaces, causing an uneven distribution of mechanical load [1, 10]. This creates a "vicious cycle" that further accelerates cartilage destruction [4, 7].Inflammation of the synovial membrane plays a crucial role in the worsening of clinical signs of knee osteoarthritis. As a result of synovitis, the amount of fluid within the joint increases, the excitability of pain receptors rises, and movement restriction intensifies [5, 8]. This condition lays the groundwork for the formation of chronic pain syndrome [21].Recent scientific works pay particular attention to the involvement of the nervous system in the pathogenesis of osteoarthritis. Processes of peripheral and central sensitization can lead to an amplification of pain impulses, resulting in severe pain sensation even when structural changes are minimal [7, 25]. The disruption of pain processing mechanisms in the central nervous system gives rise to the chronic and treatment-resistant forms of the disease [3, 12].Furthermore, imbalance in the musculo-ligamentous apparatus, reflex spasms of the muscles surrounding the knee joint, and proprioceptive impairments reduce joint stability, contributing to the deepening of degenerative processes [1, 10]. These changes, along with increased biomechanical load, lead to the progression of clinical symptoms [18, 21].In conclusion, the pathogenesis of knee osteoarthritis is characterized by the interconnectedness of degenerative, inflammatory, biomechanical, and neurogenic mechanisms. Taking these complex pathogenetic chains into account, treatment approaches must be comprehensive and multi-faceted [4, 7, 12].

Knee Osteoarthritis: Clinical Picture

Knee osteoarthritis is one of the most widespread forms of the disease, typically occurring in middle-aged and elderly patients. The clinical picture of the disease develops progressively and is characterized by the following main signs:

1. Pain: The most noticeable symptom of the disease. Initially, pain appears with physical activity, such as walking or climbing stairs, and later persists even at rest. The nature of the pain is often described as a pressing or aching sensation (Tian et al., 2023 [1]; White et al., 2001 [2]).1. Swelling and Stiffness:

Mild swelling in the joint, sometimes with localized warmth, is observed. Joint stiffness appears in the morning or after prolonged rest, typically lasting up to 30 minutes, which is considered a hallmark sign of the disease.

2. Movement Limitation and Deformity:

As the disease progresses, limitation of joint flexion and extension develops. Some patients experience knee deformity, which complicates walking and daily activities.

3. Joint Crepitus:

A muffled crunching sound that appears upon moving the joint, associated with changes in bone and joint tissues.

4. Absence or Weakness of Inflammatory Signs:

This disease often manifests as a degenerative condition without inflammation, therefore redness and warmth are usually minimal.

5. Imaging and Laboratory Diagnostics:

Radiograph: Shows joint space narrowing, osteophytes, subchondral sclerosis.

MRI: Has high sensitivity in detecting tissue erosions, fluid accumulation, and signs of inflammation.

Laboratory tests are usually within normal limits, as inflammation is often minimal.

The combination of clinical signs, the patient's age, pain intensity, and the level of functional limitation are crucial in choosing the treatment method. Therefore, dividing patients into two groups (standard drug therapy alone or combined with acupuncture) forms the methodological basis of this study (Smith et al., 2018 [5]; Campbell et al., 2019 [6]).

Acupuncture (needle therapy) is one of the oldest and most scientifically studied methods of traditional medicine, possessing complex mechanisms of action aimed at reducing pain syndrome, mitigating inflammatory processes, and improving the functional state of the joint in knee osteoarthritis [2, 7, 12]. Modern scientific research indicates that the effects of acupuncture are not limited to local reflex responses but also occur at the level of the central nervous, endocrine, and immune systems [3, 25].

Neurophysiological Mechanisms:

One of the primary mechanisms of acupuncture's action is related to the stimulation of peripheral nerve fibers. The insertion of needles into biologically active points results in afferent impulses being transmitted to the spinal cord and central nervous system, which modulates the processing of pain signals [2, 8]. This process, based on the "gate control theory," involves the inhibition of pain impulses at the central level [5, 25]. Under the influence of acupuncture, the secretion of central nervous system neurotransmitters such as endorphins, serotonin, dopamine, and melatonin increases. These substances reduce the sensitivity of pain receptors, providing a stable analgesic effect [7, 8]. Clinical research confirms that the reduction in pain intensity when acupuncture is applied is directly related to these neurogenic mechanisms [1, 5].

Neuroendocrine Mechanisms of Action:

Acupuncture influences the hypothalamic-pituitary-adrenal axis, regulating the secretion of stress hormones and anti-inflammatory mediators [12, 25]. The normalization of cortisol levels leads to a reduction in inflammatory processes and a decrease in synovial membrane swelling [6, 9]. Furthermore, the activation of neurotransmitters like serotonin and endorphins at central and peripheral levels raises the pain threshold, improving the psycho-emotional state of patients [7, 21]. This mechanism is of significant importance in knee osteoarthritis accompanied by chronic pain [3, 10].

Immune and Anti-inflammatory Mechanisms:

Research conducted in recent years has shown that acupuncture possesses immunomodulatory effects. Under acupuncture's influence, the production of anti-inflammatory cytokines (e.g., IL-10) increases, while the activity of pro-inflammatory mediators—IL-1β, TNF-α, and prostaglandins—decreases [3, 7]. This helps to attenuate the key inflammatory cascades in the pathogenesis of osteoarthritis [4, 25]. The reduction in inflammatory markers in synovial fluid is considered one of the important factors explaining the clinical efficacy of acupuncture [5, 6]. In particular, the regular application of acupuncture courses contributes to the stable control of inflammatory processes [9, 21].

Local and Biomechanical Mechanisms of Action:

Acupuncture reduces the reflex spasm of muscles surrounding the joint, thereby improving the function of the musculo-ligamentous apparatus [1, 10]. This restores biomechanical balance in the knee joint, reducing excessive load on the articular surfaces [18, 21]. The improvement in local blood circulation enhances the trophic supply to cartilage and bone tissues, activating metabolic processes [5, 6]. This mechanism creates a basis for slowing degenerative processes and improving functional status [10, 25].

Combined and Integrative Effects:

Numerous clinical studies have shown that combining acupuncture with pharmacological and physiotherapeutic methods yields high clinical efficacy [6, 9, 21]. Such a...an integrative approach offers significant advantages in reducing pain, increasing range of motion, and improving patients' quality of life [1, 2, 5].

This research was organized as an experimental clinical study aimed at assessing the clinical condition of patients with knee osteoarthritis and comparing the efficacy of acupuncture with modern standard drug therapy. The study had a controlled, two-group design.A total of 60 patients with knee osteoarthritis were enrolled in the study. Patients were selected based on the following criteria:

Inclusion Criteria: Aged 40-70 years, radiologically confirmed stage I-II osteoarthritis, pain syndrome with a VAS score ≥4, limited joint mobility.

Exclusion Criteria: Other chronic joint diseases within the last 3 months, other pain-relieving treatment methods, serious cardiovascular, endocrine, or hepatic diseases.

Patients were randomly divided into two groups:

1. Group I (Control Group): 30 patients received only modern standard drug therapy. This therapy included: nonsteroidal anti-inflammatory drugs (NSAIDs), analgesics, and chondroprotectors as needed [10, 18].

2. Group II (Experimental Group): 30 patients received a combination of acupuncture and modern drug therapy. Acupuncture sessions were conducted 3 times per week for 4 weeks, targeting specific biologically active points around the knee joint and related areas [2, 5, 7].

Drug Therapy: Patients were treated with individual dosages and drug combinations, monitored based on the level of pain and inflammation [1, 4].

Acupuncture: The following protocol was used in the experimental group: key biologically active points around the knee joint (ST35, EX-LE4, SP9, and BL40) were selected and stimulated with needles for 20–30 minutes per session. Each patient received at least 12 sessions [7, 12, 25].

Patients were assessed based on the following parameters before treatment, during the treatment process, and after treatment completion:

1. Pain Intensity: Using the Visual Analogue Scale (VAS) [2, 5].
2. Joint Function: Using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) [6, 8].
3. Joint Range of Motion: Flexion and extension angles were measured using a goniometer [1, 10].
4. Inflammatory Processes: Clinical swelling levels were monitored via regular palpation and ultrasound of the synovial fluid [3, 7].

Statistical Analysis: The obtained data were analyzed using SPSS 25.0 software. For normally distributed variables, the Student's t-test was used; for non-normally distributed cases, the Mann-Whitney U test was used. A significance level of $p<0.05$ was considered statistically significant for differences between groups [1, 5, 21].Throughout the study, all 60 patients completed the research in full. When compared based on initial parameters, Groups I and II showed no statistically significant differences in demographic and clinical aspects ($p>0.05$).

Pain Intensity (VAS)

Before treatment, the average VAS scores among patients were 6.8±0.7 (Group I) and 6.9±0.6 (Group II) ($p>0.05$).

Group I (Drug Therapy Only): After treatment, VAS decreased to 4.8±0.6 ($p<0.05$).

Group II (Acupuncture + Drug Therapy): VAS decreased to 3.2±0.5, a significantly more pronounced reduction compared to the control group ($p<0.01$) [2, 5].

Joint Function (WOMAC)

Group I: The WOMAC score decreased from 45.2±6.3 to 34.8±5.9 ($p<0.05$).

Group II: WOMAC decreased from 44.7±5.8 to 25.3±4.7, indicating significant improvement in joint function and pain for patients ($p<0.01$) [6, 8].

Joint Range of Motion

Flexion and extension angles showed significant improvement in Group II: average flexion improved from 110° to 125°, and extension improved from 0° to -5°. In Group I, flexion improved from 110° to 118°, while extension remained at 0° [1, 10].

Inflammation and Swelling In the group receiving acupuncture, levels of IL-1β and TNF-α in the synovial fluid decreased by 20–25%, and the degree of swelling significantly decreased based on clinical assessment. In Group I, these indicators decreased by only 10–12% [3, 7].The study results demonstrate that the combination of acupuncture and drug therapy is significantly more effective than drug therapy alone in reducing pain syndrome and improving joint function in patients with knee osteoarthritis [2, 5, 7].

The analgesic and anti-inflammatory mechanisms of acupuncture (increased levels of endorphins, serotonin, IL-10, and decreased activity of IL-1β and TNF-α) explain the improvement in patients' clinical condition [3, 12, 25].

Furthermore, acupuncture reduces muscle spasm around the joint, helping to restore biomechanical balance, which increases the knee joint's range of motion [1, 10]. The study results are consistent with previous meta-analyses, indicating that acupuncture, as an integrative therapy, possesses high efficacy [6, 9, 21].Clinical improvement was also observed in control

group patients who received only drug therapy, but it was significantly lower when compared to Group II. This indicates that modern drug therapy alleviates pain.....and inflammation primarily, its efficacy significantly increases when used in combination with acupuncture [5, 6].

CONCLUSION

The research results demonstrate that combining acupuncture with modern drug therapy is considerably more effective in improving the clinical condition of patients with knee osteoarthritis. Acupuncture significantly reduces pain syndrome, increases joint range of motion, and helps improve patients' quality of life.

Based on the pathogenesis, it can be stated that acupuncture, through its analgesic and anti-inflammatory mechanisms of action, slows degenerative processes in the joint, reduces muscle spasm, and restores the joint's biomechanical stability. Furthermore, the increased activity of endogenous opioids and anti-inflammatory mediators reduces patients' pain perception, which ensures clinical efficacy in cases with chronic pain.

The experimental results indicate that the integrative approach—combined use of acupuncture and standard drug therapy—is a promising and effective method for treating knee osteoarthritis. Therefore, it is essential to consider this approach when incorporating acupuncture into clinical practice and developing national guidelines.

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