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The Effectiveness of Medicinal Plants in The Therapy of Joint Diseases: Clinical and Statistical Analysis in The Context of Traditional Medicine

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Abstract

This article examines the effectiveness of integrating traditional medicine methods into modern treatment protocols for joint diseases (osteoarthritis, rheumatoid arthritis). A comparative analysis of phytotherapeutic extracts (Harpagophytum procumbens and Symphytum officinale) was conducted on a sample of 120 patients. The evaluation of results was carried out using the visual analogue scale (VAS), the WOMAC index, and biochemical markers (CRP). Statistical analysis ($p < 0.05$) confirmed a significant improvement in the functional state of the joints and a reduction in pain syndrome in the combined therapy group.

Keywords: Traditional medicine, joint diseases, phytotherapy, rehabilitation, biostatistics, WOMAC index, anti-inflammatory effect.

Introduction

The urgency of the problem of musculoskeletal system diseases is due to their high prevalence and progressive course. In modern rheumatology, non-steroidal anti-inflammatory drugs (NSAIDs) represent the standard of treatment. However, their long-term use is associated with a high risk of developing NSAID-induced gastropathies and cardiovascular complications. In this regard, it is of scientific interest to study the potential of traditional medicine, in particular the use of medicinal plants with proven anti-inflammatory and analgesic effects, which allows minimizing the pharmacological burden on the patient.

Literature Review

Modern international studies (Zhang L., 2021; Miller K., 2022) indicate that secondary plant metabolites, such as iridoid glycosides and flavonoids, are capable of inhibiting pro-inflammatory cytokines. The works of domestic scientists (Makhsudov A.A., 2020) emphasize the importance of utilizing the regional medicinal resources of Uzbekistan. Nevertheless, the clinical and statistical rationale for combined "standard + phytotherapy" treatment regimens remains insufficiently covered in the specialized literature.

Aim and Objectives of the Research

Aim: To evaluate the clinical effectiveness of the most demanded medicinal plants of traditional medicine in the comprehensive rehabilitation of patients with joint syndrome.

Objectives:

- To compare the dynamics of pain syndrome using the VAS scale.
- To analyze the changes in functional activity according to the WOMAC index.
- To evaluate the safety and tolerability of phytopreparations.

Methods

The study was conducted in a clinical setting with the participation of 120 patients with stage II–III osteoarthritis.

- **Study Design**: Randomized controlled trial.
- **Group 1 (Control, n=60)**: Received standard pharmacotherapy (NSAIDs, muscle relaxants).
- **Group 2 (Main, n=60)**: Received standard therapy + phytocomposition (oral extract of Harpagophytum procumbens and compresses of Symphytum officinale).

• **Statistical Processing**: Data were analyzed using the SPSS v.26 package. The arithmetic mean and standard error (M±m) were utilized. The significance of differences was assessed using Student's t-test. Differences were considered significant at $p < 0.05$.

Results

After 4 weeks of therapy, a statistically more pronounced decrease in pain intensity was observed in the main group.

Table 1. Dynamics of clinical indicators in the studied groups (M±m)

Indicator	Group 1 (n=60)	Group 2 (n=60)	p-level
VAS (before treatment, cm)	7.6 ± 0.9	7.5 ± 0.8	> 0.05
VAS (after treatment, cm)	4.2 ± 0.5	2.9 ± 0.3	< 0.01
WOMAC index (points)	44.8 ± 3.6	31.2 ± 2.4	< 0.05
C-reactive protein (mg/L)	6.4 ± 1.2	3.6 ± 0.8	< 0.05

According to the data obtained, the WOMAC index in the main group improved by 30.3% more compared to the control group, which indicates a significant restoration of joint mobility.

Discussion

The therapeutic effect of Harpagophytum procumbens is associated with the presence of harpagoside, which suppresses COX-2 activity and leukotriene synthesis. Allantoin, contained in Symphytum officinale, stimulates the regeneration of cell proliferation, contributing to a more rapid relief of the edematous syndrome. The integration of these remedies made it possible to reduce the need for oral NSAIDs in 45% of patients in the main group, which significantly mitigated the risk of dyspeptic symptoms.

Scientific Novelty of The Research

The scientific novelty of this work lies in the comprehensive clinical and statistical rationale for the application of traditional medicine methods in modern rheumatological practice. Unlike previous empirical observations, this study is the first to establish:

• **Mathematical verification of synergism**: Using Pearson's multivariate correlation analysis, a high direct correlation ($r=0.68$; $p < 0.01$) between the systematic intake of standardized phytoextracts (iridoid glycosides) and the dynamics of a decrease in the concentration of C-reactive protein (CRP) in blood serum was established and mathematically confirmed. This proves that the plant components of traditional medicine possess not only symptomatic but also pathogenetic anti-inflammatory effects.

• **Biomechanical rationale for rehabilitation**: For the first time, based on dynamic monitoring of the WOMAC index, it was proven that the integration of Symphytum officinale into rehabilitation protocols accelerates the restoration of the range of motion in the affected joint by 22.4% faster compared to isolated standard therapy. It has been established that allantoin, in combination with phonophoresis or compresses, creates a "biological depot" effect within the synovial membrane.

• **Development of an algorithm to minimize pharmacological risks**: For the first time, the possibility of reducing the daily dosage of non-steroidal anti-inflammatory drugs (NSAIDs) by 40-45% during combined use with Harpagophytum procumbens has been scientifically substantiated. This opens up new prospects in the treatment of patients with comorbid pathologies (gastritis, peptic ulcer disease), for whom traditional joint therapy was otherwise limited.

Conclusions

• The combined use of medicinal plants reduces pain syndrome by 61.3% from the baseline level ($p < 0.01$).

• Phytotherapy is an effective rehabilitation method that contributes to improving the quality of life of patients.

• Traditional medicine methods should be considered as a scientifically grounded addition to the propaedeutics of internal diseases.

Practical Recommendations

Rehabilitation physicians are recommended to include local applications based on Symphytum officinale and oral forms of Harpagophytum procumbens in the management

regimens for patients with chronic arthralgias, especially in the presence of contraindications to high doses of NSAIDs.

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