



# Complex rehabilitation of patients with rheumatoid arthritis

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## Abstract

Rheumatoid arthritis (RA) is a common chronic autoimmune disease characterized by symmetrical polyarthritis, joint pain, and morning stiffness. It significantly impairs physical condition and increases the risk of functional disability. While conventional treatments include drug therapy, many patients continue to experience symptoms and seek alternative therapies to improve their condition. This article describes two clinical cases of RA patients treated with a comprehensive rehabilitation program, including moderate-intensity walking, yoga, and nutritional therapy. The study aimed to evaluate this approach's effectiveness in improving the patients' functional capacity and quality of life. The first patient (50 year-old female) noted a significant reduction in the number of painful joints (by 14) and swollen joints (by 12) after a three-month rehabilitation course. The visual analog scale (VAS) pain level decreased from 80 mm to 50 mm, and the duration of morning stiffness decreased from several hours to 80 min. The second patient (45 year-old female) also showed improvement: painful joints decreased from 13 to 2, and swollen joints from 7 to 1. VAS pain level decreased from 80 mm to 40 mm, and morning stiffness decreased by 50 min. Both patients reported an average reduction in excess weight by 1.65 kg/m<sup>2</sup>, along with improvements in general well-being and mood. The results confirm that a comprehensive rehabilitation approach, including physical activity, yoga, and diet therapy, significantly improves the condition of RA patients. This approach helps reduce pain, decrease the number of inflamed joints, and improve overall functionality. Further studies with a larger sample are needed to determine the optimal rehabilitation strategies and the most impactful interventions.

**Keywords** Rheumatoid arthritis · Case reports · Rehabilitation · Exercise · Physical and rehabilitation medicine

## Introduction

Rheumatoid arthritis is a chronic, inflammatory autoimmune disease [1], affecting 14 million people worldwide [2]. Although RA is characterized by significant extra-articular manifestations [3], it primarily involves the small joints of the hands and feet [4]. The pathology of RA includes damage to the synovial membrane, bone degradation, and cartilage destruction. Dendritic cells, macrophages, and mast cells play crucial roles in interacting with autoantigens and triggering joint inflammation [5]. The clinical diagnosis of RA is based on the presence of symmetrical polyarthritis,

prolonged morning stiffness lasting more than an hour, and the onset of subsequent deformities [6]. This joint syndrome is associated with joint pain and swelling, which can significantly impair physical function [7]. Additionally, RA patients are prone to adverse changes such as muscle atrophy and increased fat mass, leading to more significant functional disability [8]. Furthermore, systemic inflammation in rheumatoid arthritis increases the risk of developing cardiovascular disease, which is the leading cause of mortality in these patients [9].

While strictly controlled treatment strategies and significant advancements in disease-modifying anti-rheumatic drugs have substantially improved the condition of RA patients [10], many still do not achieve remission and continue to experience progressive functional impairment [11]. Consequently, almost one in three RA patients face employment difficulties, and the disability rate among them is ten times higher than in the general population [12].

In this context, non-pharmacological methods for managing RA, such as massage, acupuncture, healthy sleep, and

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exercise, warrant closer attention [13]. Regarding exercise, the World Health Organization recommends that adults aged 18–64 engage in at least 150–300 min of moderate-intensity aerobic physical activity each week to maintain good health [14]. Exercise is essential as it can slow the progression of RA and prevent disability [15]. Physical activity helps reduce the expression of systemic inflammatory genes [16], improves cardiovascular health, increases muscle mass, reduces obesity, and enhances strength and physical functionality without exacerbating the disease or causing joint damage [17]. In addition to physical exercise, RA complex therapeutic strategies often focus on electrophysical methods, healthy diet, and psychological well-being [18]. Yoga is an intriguing approach that simultaneously addresses mental and physical health by combining meditative breathing with physical activity [19, 20]. Several studies have evaluated the effectiveness of different rehabilitation methods separately [21–24]. However, the additive effects of rehabilitation approaches on RA patients, which require multidisciplinary collaboration [25], need further evaluation. This article describes two clinical cases of RA patients undergoing comprehensive rehabilitation, including moderate-intensity aerobic exercise, yoga, and nutritional therapy. This study aims to evaluate the effectiveness of integrated rehabilitation on the condition of RA patients, focusing on the impact of these methods on their functional capacity and quality of life.

## Case reports

A 50-year-old female patient complained of pain in the small joints of her hands, wrists, and ankles, symmetrical swelling of her ankle joints, increased pain with movement, morning stiffness lasting several hours, headache, dizziness, and general weakness. She was diagnosed with RA in 1984. Initially, she was treated with Methotrexate (15 mg/week), but due to side effects, her medication was switched to Leflunomide (20 mg/day). Her medical history revealed no tuberculosis, hepatitis, or skin diseases. She did not consume alcohol and did not smoke. Her family history was remarkable since her sister was also diagnosed with RA. She was hypertensive with height of 166 cm, weight of 80 kg, and body mass index (BMI) of 29.0 kg/m<sup>2</sup>. Her skin was pale, and her peripheral lymph nodes were not enlarged. The musculoskeletal examination revealed painful proximal interphalangeal joints of the hands, small joints of the feet, ankles, and knees, along with hypotrophy of the interosseous muscles of the hands. Her fingers were deformed with swan-neck pattern, and palpation of these joints revealed local hyperthermia, hyperemia, and increased pain. The hand compression symptom was positive bilaterally. Palpation of the

knee joints revealed crepitation bilaterally. Her pain level, measured by the Visual Analog Scale (VAS), was 80 mm, with 22 painful joints and 16 swollen joints. The duration of morning stiffness was 150 min. Her respiratory system was unremarkable. Cardiovascular examination revealed regular heart borders, rhythmic but muffled heart tones, blood pressure of 120/70 mm Hg on both sides and heart rate of 76 bpm. The digestive and urinary systems were without abnormalities.

The second patient, a 45-year-old woman, complained of pain in the small joints of both hands, wrists, elbows, shoulders, and feet, along with morning stiffness. She suffered from RA since 2013, and she was treated with Methotrexate 15 mg/weekly. Her medical history showed no significant family history of RA. She did not smoke and did not consume alcohol. She was hypertensive with height of 160 cm, weight of 76 kg, and BMI of 29.7 kg/m<sup>2</sup>. Examination revealed seven swollen and 13 painful joints, with morning stiffness lasting 120 min. Her VAS pain index was 80 mm.

To improve their conditions, a comprehensive rehabilitation program was recommended, in addition to essential drug therapy. The complex rehabilitation program included the following:

### Diet therapy

A nutritionist developed a diet plan rich in omega-3 fatty acids, antioxidants, and vitamins. The diet included fish, nuts, fresh fruits, vegetables, limited sugar, and processed foods.

### Aerobic exercise

Patients were encouraged to walk at a moderate intensity, averaging 8,000 steps per day.

### Relaxation techniques

Patients engaged in yoga sessions twice a week for 40 min.

**Sleep and Rest:** Patients were advised to adjust their daily routine to include 7–9 h of sleep each night and short rest periods during the day.

Three months after starting the rehabilitation program, both patients reported significant improvements in their general condition and mood. The first patient's condition improved with the number of painful joints decreasing to 8 and swollen joints to 4. The VAS pain index decreased to 50 mm, and the duration of morning stiffness reduced from 150 min to 80 min. Additionally, she reported a weight loss from 80 kg to 74 kg, and her BMI decreased to 26.9 kg/m<sup>2</sup>. The second patient also showed improvement, with her weight decreasing from 76 kg to 73 kg and her BMI to

28.5 kg/m<sup>2</sup>. The number of painful joints decreased to 2, and the number of swollen joints to 1. Her VAS pain index decreased to 40 mm, and the duration of morning stiffness reduced from 120 min to 70 min.

## Discussion

Some medications can reduce rheumatic symptoms [26], but the side effects are increasingly prompting patients with RA to choose alternative therapies to alleviate their condition. Regular physical activity is recommended for people with RA to help reduce disease activity and systemic inflammation [27]. The positive effects of physical activity and exercise on clinical, metabolic, and cardiorespiratory parameters in patients with RA have been documented in several studies [28].

A recent study by Peres and colleagues found that people with RA often have a fear of movement, which increases disease activity [29]. This fear partly explains this group's lack of physical activity and difficulty managing exercise at the required intensity [29]. In the current study, both patients with RA were engaged in exercising, including yoga sessions and daily walking of moderate intensity. Walking is an accessible, low-trauma exercise requiring no specialized training and is crucial in maintaining patients' independence. A study by Baxter and colleagues showed that participants in a walking program improved their self-efficacy and general well-being [30]. Another study by Bartlett et al. found that a ten-week course of high-intensity interval walking decreased disease activity, increased aerobic capacity, and improved antibacterial innate immune defence in patients with RA [31]. Individually adapted moderate-intensity exercise, under personalized guidance, reduced fatigue, improved symptoms of depression, and induced metabolic changes in older adults with RA [32].

In addition to exercise, patients often resort to dietary therapy to alleviate their symptoms. Some dietary choices can increase inflammation (e.g., red meat, salt, excessive calorie intake), while others, such as oily fish and fruits, can help reduce inflammation [33]. Diet significantly affects the human intestinal microbiota, crucial in modulating the immune response and the development of RA [34]. Therefore, choosing the proper diet is crucial as it can influence the disease manifestation, course, and outcome [35]. Popular dietary approaches include vegetarian and gluten-free diets, the Mediterranean diet, elemental and elimination diets, and fasting, with widely used supplements [36]. A study evaluating the effects of combined diet and exercise showed improvements in physical activity, lower low-density lipoprotein cholesterol levels, and increased nutrient intake [37]. In our study, both patients were recommended

a healthy diet supplemented with antioxidants, vitamins, and omega-3 fatty acids. A systematic review showed that supplementation with omega-3 polyunsaturated fatty acids significantly improved the duration of morning stiffness, pain levels, erythrocyte sedimentation rate, and physical function [38].

Sleep is also crucial for the functioning of the immune system and is essential for restoring and maintaining homeostasis [39]. A 16-week lifestyle program significantly reduced disease activity (mean reduction in DAS 28 by 0.9 points) and improved metabolic status in people with RA who had low to moderate disease activity [40].

This article described two clinical cases of a comprehensive rehabilitation program, including moderate-intensity walking, yoga, and nutrition therapy. The results showed improvement in the patients' conditions, with a reduction in the number of painful and swollen joints, and a decrease in pain and morning stiffness. In the first patient, after the rehabilitation course, the number of painful joints decreased from 22 to 8, swollen joints from 16 to 4, VAS pain level decreased from 80 mm to 50 mm, and morning stiffness decreased by 70 min. In the second patient, the number of painful joints decreased from 13 to 2, swollen joints from 7 to 1, the VAS pain level decreased from 80 mm to 40 mm, and morning stiffness decreased by 50 min. Additionally, physical activity combined with a healthy diet helped the patients reduce their body weight by an average of 4.5 kg (average BMI decreased by 1.65 kg/m<sup>2</sup>).

The main message of the study is to show the effectiveness of a comprehensive rehabilitation program, including moderate-intensity walking, yoga, and nutrition therapy, in improving the functional capacity and quality of life of patients with RA. The study presented two clinical cases of long-lasting RA patients who experienced significant reductions in painful and swollen joints, improvements in pain levels and morning stiffness, as well as general well-being and mood enhancements after undergoing the comprehensive rehabilitation program. The study emphasizes the potential benefits of non-pharmacological approaches, such as exercise and yoga, in managing RA and improving patients' overall well-being. However, because we described the effects of rehabilitation measures in an integrated manner, it is unclear which interventions had the most significant impact on joint syndrome regression and overall improvement.

## Conclusion

The described clinical cases demonstrate the effectiveness of a comprehensive approach to the rehabilitation of patients with RA. Incorporating yoga, physical activity, and dietary

changes into the treatment plan may significantly improve the quality of life for patients and slow disease progression. Applying such multifaceted approaches in clinical practice is recommended to achieve better results in treating RA.

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## Declarations

**Informed consent** Written informed consent was obtained from both patients.

**Conflict of interest** None declared

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