

**Review Article**

# The Contribution of Exercise in Rheumatoid Arthritis

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**Abstract:** Rheumatoid Arthritis (RA) is a systemic autoimmune inflammatory disease of unknown etiology that leads to inflammation of the joints. For many years it was believed that people who suffer from various forms of arthritis should not exercise because through the intensity of exercise can worsen symptoms and cause additional damage to the joints. Today scientists engaged in health recognize the benefits that can provide a controlled and adapted to the needs of each patient's exercise program and rest. The rest prevents fatigue of the joints and helps to reduce inflammation and pain. The exercise aims generally to improve health. The purpose of this review is to set out general information on the contribution of exercise in rheumatoid arthritis. The study material was the latest articles on this issue of the last decade that were found mostly in the online Medline database and the Association of Greek Academic Libraries (HEAL-Link). Doctor, nurse and the physiotherapist should be informed on developments in exercise science and the role of a good balanced exercise program to maintain patient's health and its contribution to dealing the rheumatic diseases. It contribute both to the maintenance of the motion range of joints, and tonicity of muscles and to the maintenance of strength and flexibility of the muscles, tendons and ligaments of the joint.

**Keywords:** Rheumatoid Exercise, Exercise, Exercises Types

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## 1. Introduction

Rheumatoid Arthritis (RA) is a systemic autoimmune inflammatory disease of unknown etiology that leads to inflammation of the joints that it is manifested by swelling, pain, impaired joint mobility and muscle weakness, and is associated with increased risk for cardiovascular disease and osteoporosis. [1, 2]

Around 4500 BC are found the first known traces of rheumatoid arthritis (RA). Symptoms similar to those currently recognized as rheumatoid arthritis were described in a text dating from 123 AD. The first recognized description of rheumatoid arthritis was made in 1800 by the French physician Dr. Jacob Augustin Landre-Beauvais (1772-1840) and it was based on the famous Salpetriere Hospital from Paris. In 1859 the rheumatoid arthritis term was coined by the British rheumatologist Dr. Alfred Baring Garrod. [3, 4]

RA can lead to progressive destruction of cartilage and bone, resulting in structural damage and functional disability. RA affects more women than men at a ratio of 3-4: 1, basically of all ages, but more often of the middle age. Although the clinical presentation may vary, the typical image of installed

RA is bilateral, symmetrical, inflammatory polyarthritis in small and large joints of the upper and lower limbs, without involvement of the spine with the exception of cervical spine. [5, 6]

The predominant symptoms of RA include pain, morning stiffness and swelling of the peripheral joints. Quite rare, might be observed systematically extra-articular signs and localization of the disease as subcutaneous nodules, Sjogren's syndrome, pulmonary affect or vasculitis. [7, 8] Laboratory results include chronic type of anemia and elevated inflammatory markers in active disease: autoantibodies against the Fc region of IgG -the so-called rheumatoid factor- and autoantibodies against citrullinated peptide which incorporate the amino acid citrulline are detected with varying degrees of sensitivity and specialty. [8, 9] Various genetic, hormonal, immunological and environmental factors have been implicated as factors in the development of RA, leading to heterogeneity of disease incidence and severity. [10, 11] Compared with Northern Europe, different environmental and genetic background seems to be associated with the milder nature of the disease in Greece. [12] The PA in Greek population is characterized by a smaller degree synovial

inflammation, fewer extra-articular manifestations, less severe joint destruction and high frequency of antibodies associated with a higher prevalence of secondary Sjogren syndrome. [1, 13]

## 2. Purpose

The purpose of this review is to set out general information on the contribution of exercise in rheumatoid arthritis, including the main forms of exercise.

## 3. Review Methods

The study material was the latest articles on this issue of the last decade that were found mostly in the online Medline database and the Association of Greek Academic Libraries (HEAL-Link). The main part of the bibliography has been review and other research work. Also studied various books related to the subject of research. Exclusion criterions was the language, other than English and Greek and were used the following keywords: rheumatoid exercise, exercise, exercises types.

## 4. The Role of Exercise in Rheumatoid Arthritis

Rheumatoid arthritis, as a chronic autoimmune inflammatory disease, causes in patients a gradually damage the musculoskeletal system, a reduced functionality and an increased total energy consumption. [12, 14] For many years it was believed that people who suffer from various forms of arthritis should not exercise because through the intensity of exercise the symptoms can worsen and additional damage to the joints can be caused. [15, 16]

Today all healthcare scientists recognize the benefits that can provide a controlled and adapted to the needs of each patient's exercise and rest program. [9, 10] The rest prevents the fatigue of the joints and helps by reducing inflammation and pain. The exercise generally aims to improve health. Contribute both to the maintenance of the joints motion range, and muscle tone of muscles and to the maintenance of strength and flexibility of the muscles, tendons and ligaments of the joint. Moreover, it significantly helps to maintain a good bone density. [17]

Crucial importance is the contribution and the general mood of the patient, by improving the psychology, the sleep quality, the self-esteem and the independence feelings and allowing to perform simple daily movements that in the past most likely were impossible (e.g. tying shoes). [18]

Exercise improves the physical condition and reduce body weight significantly fact that will keep the patient in stable healthy levels. Exercise combined with medication, rest and healthy diet, can greatly improve the life quality of people who are suffering from rheumatoid arthritis. The general target of physical activity is to improve and maintain the vigor with continuous and long-term engagement. [16, 18] RA

patients seem to benefit from the long-term participation in exercise programs because it significantly improves muscle strength, reduces disease activity and increases bone density levels. [10, 12] However there are some patients who do not wish to implement a exercise program because they are thinking that it can lead to an increased discomfort or further deterioration of the joint. In fact the opposite is true because without exercising the pain will gradually increase, the path of motion of the joints is reducing and a simple little motion will seem impossible for patients. [17, 18] The result of this is that the muscles become weaker, unable to perform any movement, so that the patients are physically inactive and dependent on others which can easily lead to depression symptoms. [18, 19]

## 5. Exercise Types

Pain is a major symptom and must be given the proper attention. The patient who is in pain for more than an hour after the exercises or remains immobilized the following day has exceeded the capability limits during the motion. After the exercises it should be checked if the joints show erythema and edema. In this case, the frequency should be reduced and should be reviewed the appropriateness of the exercise type. [20, 21].

The most common exercises for rheumatoid arthritis are the following:

### 5.1. Range of Motion Exercises

These are stretching exercises, which mobilize each joint as much as possible. These exercises should be applied on a daily basis in order to keep the joints in full stability and to prevent stiffness and deformities. The range of motion exercises is especially important for people with arthritis, because due to the inflammatory state and pain, tend to immobilize increasingly less their joints. Here integrates and the flexibility exercises, which will help the muscles to maintain their normal length. [17, 18]

### 5.2. Strengthening Exercises

The strengthening exercises significantly contribute to the improvement of muscle strength. So the muscles are able to assist and support the joints, making them stable, while enabling the person to move with less pain. There are two types of strengthening exercises: the isometric and the isotonic exercises. [18, 22]

### 5.3. Isometric Exercises

The isometric exercise are using a static isometric contraction of the muscle in which the length of the muscle remains unchanged and the member does not move. The exercise is performed by contraction of the muscle against a constant unchanged resistance. Isometric exercise may be used to increase and maintain muscle strength and endurance. [21] For people with rheumatoid arthritis the isometric programs are considered highly effective. The programs consist of 3 maximal contractions with 6 to 20 minutes rest

period after each contraction. Finally, the isometric exercises cause the least possible joint inflammation, intraarticular compression and periarticular bone deterioration, and are usually well tolerated by patients with RA. Therefore, the isometric exercises are the most common forms of exercise recommended when there is inflammation and joint injection. [17, 23]

#### 5.4. Isotonic Exercises

The isotonic exercise can be applied using a gradually increasing resistance. It is the most commonly used form of exercise for increasing strength and muscle hypertrophy. The program is configured to execute 10 repeats with 50% of the whole body weight, followed by 10 repetitions of 75% and at the end 10 repeats with 100% of the whole body weight. Similar benefits can result if it is used a program with moderate weights and few repetitions. This is the type of exercise that is recommended in patients with articular problems because it creates less pressure on the joint. [22, 23]

#### 5.5. Strength Exercises

Patients with rheumatoid arthritis often feel fatigue fact that leads to a reduction of the activity index. Often this is caused by a strength decrease as a result of the activity reduction due to the pain in the joints. [12] Strength exercises aim to increase the capacity of skeletal muscle and cardiac muscle by increasing the pulse rate and volume. [17, 18] Strength exercises or otherwise aerobic exercises are activities that increase the heart rate for 20 to 30 minutes in order to improve cardiorespiratory resistance. The heart rate zone is determined by the age and level of fitness of each patient. By increasing the heart rate with these exercises is simultaneously improve the fitness levels. [18, 23] Examples of low intensity aerobic exercises include walking, swimming, cycling, etc. Patients with rheumatoid arthritis, who apply at regular intervals an appropriate exercise program increase their strength, develop a more positive attitude towards their situation and significantly improve the symptoms of arthritis. However some patients with long-standing rheumatoid arthritis are not capable to perform strength exercises, due to operational constraints. Therefore, their implementation should be done carefully to avoid injury probability. [22, 23]

#### 5.6. Walking

Walking is a great choice as activity. Walking helps increase strength and maintain the flexibility of joints, while contributing to bone health by reducing the risk of osteoporosis. [17, 21]

#### 5.7. Water Exercises

The exercises in the water are usually recommended for patients with inflammatory myopathy and arthropathy and to those with moderate to severe degenerative diseases. Water is often used postoperatively after joints and tendon surgery. The water reduces the action of gravity, reduces the tendency of the muscles that needs to engage a member to be moved and

lowers the pressure between the joints of the lower extremities. [12] Exercising in warm water is an excellent way to improve the strength of patients with arthritis, and to facilitate the ligaments hardness and the shrinkage of muscles. [18, 23] Heat provides local and systemic relaxation reduces pain, increases tolerance to painful impulses and increases painless movement. Swimming helps to support the body and reduce the load on the joints of the hip, knee and spine. [17, 22]

#### 5.8. Entertaining Exercise

Patients with rheumatoid arthritis may be encouraged to pursue recreational sports. Their specific interests, their sociability and the type or stage of arthritis may limit their participation in certain types of activities. [16, 21] Activities such as swimming, gardening, walking, running, cycling and various sports (e.g. tennis rackets) is generally suitable. [18, 24] They can help to protect the joints, to increase strength and endurance, while offering opportunities for social life and self-esteem. They may also have an antidepressant effect [22, 25] Today there is a wide variety of sports accessories specially designed for the needs of patients. For people with rheumatoid arthritis in the small joints of the hands, there are customized grips for rackets, gardening tools, golf clubs and other items. [18, 26]

## 6. Conclusion

Each person is different and responds differently to exercise that will choose. The type, the duration, the intensity and the frequency of the exercises are determined by the collaboration of orthopedists, physical therapist and trainer that are responsible in general for the organization of a complete exercise program, taking consideration always the degree of arthritis, physical fitness and resistances and skills of each patient individually.

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