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The Role of Physical Activity in the Therapy of Psoriatic Arthritis – Review

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ABSTRACT

Psoriatic arthritis (PsA) is a chronic inflammatory joint disease presenting a heterogeneous clinical picture. It is characterized by both skin and joint symptoms, which significantly affects the quality of life of patients. In recent years, there have been rapid developments in the treatment of SD. Modern treatments include the use of classic disease-modifying drugs, as well as biologic drugs and ianus kinase inhibitors. An important component of treatment that is often

underestimated is physical activity. Regular exercise has a proven effect on improving joint function, reducing pain and improving overall physical condition in patients with SD. Physical activity can help reduce the severity of disease symptoms, improve joint range of motion, and increase cardiovascular fitness. The purpose of this article is to present modern therapies for SD, taking into account the role of physical activity in the comprehensive treatment of this disease. Both pharmacological and non-pharmacological therapeutic approaches will be discussed.
Keywords: psoriatic arthritis, treatment, physical activity, physical exercises, pain, quality of life

Introduction

Psoriasis is a chronic inflammatory disease that can present a heterogeneous clinical picture [1]. In addition, 30% of patients may develop psoriatic arthritis (PsA) [1]. It affects between 0.1% and 1% of the population, although the figures vary by continent - for example, the disease is more common in Europe than in Asia [1]. The pathogenesis of the disease is influenced by both genetic and environmental factors [1]. It can also be accompanied by nail psoriasis, inflammation of the fingers (dactylitis) and tendon attachments (enthesitis) [2, 3]. Arthritis can take any of the following forms (according to Moll and Wright's classification):

1) distal interphalangeal predominant arthritis - in this variant, the distal interphalangeal joints (DIP) are involved (this is important for differentiation from rheumatoid arthritis (RA), in which the proximal interphalangeal joints (PIP) are most often involved); it affects about 5% of patients, and often coexists with nail involvement [4];

2) asymmetrical oligoarthritis - affects about 70% of patients, occurs when less than 5 joints are involved, often occupies the DIP joints [4];

3) symmetrical polyarthritis - affects about 25% of patients, due to symmetrical joint involvement it somewhat resembles RA [4];

4) arthritis mutilans - a crippling form, occurs in 5% of patients, as a result of destruction of the PIP and DIP joints, there is shortening of the fingers and the formation of a characteristic picture described as opera glass hand [4];
5) spondylitis - affects about 5% of patients, follows a similar course to ankylosing spondylitis (AS), the main symptom is spinal stiffness and pain in the sacroiliac joints [4].

The end result of AS is joint destruction and loss of function [3]. During the course of the disease, permanent inflammation persists, which can further generate damage to other tissues and organs - the cardiovascular system, intestines, uveal membrane of the eye, etc. [1, 5]. In addition, patients often experience depression, sleep disorders, and metabolic disorders, which significantly reduce quality of life [5].

The diagnosis of SD is made based on the CASPAR criteria [6]. The patient is given points for: the presence of active psoriatic skin lesions diagnosed by a rheumatologist or dermatologist (2 points) or a personal or family history of psoriasis (1 point), characteristic psoriatic nail lesions in the form of napiness, onycholysis, and increased keratosis found on physical examination (1 point), non-detection of rheumatoid factor in any test except the latex test (1 point), determination by a rheumatologist of dactylitis - currently or in the history (so-called sausage toe) (1 point), typical picture in X-ray of hands or feet - present demarcated ossification close to the edge of the joint (1 point) [6].

Psoriatic arthritis is one of the diseases that particularly affect the quality of life of patients - on the one hand, it often occupies the skin, which can lead to stigma and hinder interpersonal relationships and self-esteem problems, on the other hand, it attacks the joints, which can lead to significant difficulty in performing daily activities [7, 8]. It is therefore both a physical and emotional health problem [7]. Early recognition of SD and prompt implementation of appropriate treatment offers a chance to minimize joint destruction and keep the patient functioning at a good level. In this paper, we will focus on the treatment modalities for SD with consideration of modern biologic drugs and ianus kinase inhibitors, as well as consider the role of physical activity in therapy.

Methodology

The literature analysis was performed using the PubMed database. Only publications from the last 15 years were included. The keywords used were psoriatic arthritis searched in combination with physical activity or alone. Articles classified as review, systemic review, randomized controlled trial and meta-analysis were analyzed. Only publications in English were used. Articles cited in the publication were selected by 1 researcher.

Treatment

The primary goal of treatment is to achieve remission or, when this is not possible, low disease activity [9, 10]. According to the treat-to-target strategy, a 50% reduction in disease activity should occur after 3 months of treatment, and after 6 months the treatment goal should be achieved [9]. A variety of scales can be used to monitor disease activity, including. Psoriatic Arthritis Disease Activity Score (PASDAS), Disease Activity Index for Psoriatic Arthritis (DAPSA) - mainly for the peripheral form, Ankylosing Spondylitis Disease Activity Score (ASDAS), Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) - mainly for the axial form, Dactylitis Severity Score (DSS) or Psoriasis Area and Severity Index (PASI) [11]. On the other hand, from the patients' point of view, the main goals of treatment are to reduce the intensity of pain and fatigue, as well as to improve physical, social and occupational functioning [12].

Non-steroidal anti-inflammatory drugs (NSAIDs) and intralesional injections of corticosteroids (ICS) can be used for the short-term treatment of psoriasis - they result in a reduction of joint discomfort, although they have no effect on psoriasis [9]. The use of systemic ICS is contraindicated due to possible side effects [9]. In contrast, patients with isolated dactylitis should be treated with delivery injections of NSAIDs and conventional synthetic disease-modifying antirheumatic drugs (csDMARDs) [9]. NSAIDs in monotherapy lasting up to 4 weeks are indicated in patients with mild peripheral form, tendinitis or axial form [9]. If significant improvement is achieved in the axial form, treatment can be prolonged [9]. For patients with involvement of multiple joints or only single joints, but with negative prognostic factors present, such as nail involvement, elevated inflammatory markers, rapid joint destruction, it is recommended to start treatment with csDMARDs - methotrexate, sulfasalazine or leflunomide [9]. For skin involvement, the first choice drug is methotrexate at a final dose of 20-25 mg/week [9]. When using this drug, there is a need for folic acid supplementation [9]. The patient should also be evaluated on an ongoing basis for side effects, including hepatotoxicity [9]. In case of ineffectiveness, it is possible to change to another DMARD, such as: biological disease-modifying antirheumatic drug (bDMARD), although if there are no negative prognostic factors and the inflammation is limited to only a few joints, a trial of treatment with a second csDMARD may be considered [9]. The bDMARDs include several groups of drugs: tumor necrosis factor (TNFα) inhibitors, interleukin-17 (Il-17) inhibitors, interleukin (Il-23) inhibitors [9]. It should be taken into account that the use of each of these drugs increases the risk of various types of infections in patients [9]. It is worth mentioning that

patients may benefit from combining methotrexate therapy with bDMARDs, especially with TNFα inhibitors, due to the lower risk of loss of efficacy of the latter in such a combination [9]. On the other hand, if therapy with bDMARDs fails to produce a certain improvement, janus kinase (JAK) inhibitors can be used [9]. For the axial form, NSAIDs are the first-line treatment, while TNFα inhibitors, Il-17 inhibitors and JAK inhibitors can be used in further steps [9].

The choice of drug should also take into account extra-articular manifestations - in case of severe skin lesions, Il-17 inhibitors will be the first choice therapy, in patients with inflammatory bowel disease - TNFα inhibitor or Il-23 inhibitor or JAK inhibitor, and in patients with uveitis - TNFα inhibitor [9]. It is worth mentioning that each of the above-mentioned groups of drugs presents specific side effects - in the context of the present study, for example: increased lipid levels and increased cardiovascular risk in high-risk patients who are treated with JAK inhibitors [13]. An effective method of correcting these disorders is regular physical activity, although pharmacological methods, such as the use of glucagon-like peptide 1 agonists and sodium-glucose cotransporter 2 inhibitors, are of course also being studied [13].

Effect of lifestyle on disease activity

It is known that factors such as chronic stress, sedentary lifestyle, obesity, smoking, alcohol consumption and sleep deprivation can trigger exacerbation of psoriasis and SD [10]. The latter can occur in up to 85% of patients, which may be due to pain, anxiety, chronic fatigue, among other things [14]. It is important to remember that an abnormal lifestyle intensifies the vicious circle mechanism [15, 16]. For example - obesity is more common in patients with psoriasis and SD than in the healthy population, while increased body weight exacerbates the symptoms of the underlying disease [16]. It has been confirmed that weight loss, whether caused by changes in habits or bariatric surgery, led to improved psoriasis control [16]. Cigarette smoking, on the other hand, leads not only to exacerbation of psoriasis and Psoriasis symptoms, but also to associated health problems - increased depression, increased risk of cancer and cardiovascular events, deterioration of bowel function due to changes in the microbiota, which in turn is an important factor that affects the activity of the underlying disease [15]. Thus, non-pharmacological methods should be used in parallel with pharmacological treatment to improve the health of patients with SD [17, 18]. It has been shown that non-pharmacologic interventions can have positive effects on both cutaneous psoriasis and peripheral and axial arthritis, tendonitis or dactylitis [10]. This includes weight reduction, changing the diet, e.g.: to a Mediterranean diet, using other methods of coping with stress than

smoking, such as: meditation, exercise, spa treatment or acupuncture, patient education, psychotherapy as well as physical activity precisely [10, 15, 18, 19, 20, 21].

Physical activity as part of therapy

Physical activity is an established component of therapy in other rheumatologic diseases such as RA and ankylosing spondylitis [17]. Despite this, few studies have been conducted to demonstrate the usefulness of exercise in the treatment of SD [17, 22, 23]. There is evidence that patients who introduced regular physical activity into their lives showed improvements in disease activity scores as measured by the BASDAI scale, perceived fatigue and pain, as well as significant improvements in quality of life [17]. It enabled the maintenance of joint function, thereby increasing the patient's chance of maintaining function at a good level [10, 21]. It also facilitated the maintenance of normal body weight, which reduced the severity of oxidative stress and disease activity [10, 13]. This is worth emphasizing, since of all patients with inflammatory joint diseases, it is the metabolic syndrome, of which obesity is one component, that is most prevalent in patients with SD [13]. Regular exercise also resulted in reduced cardiovascular risk in patients [17]. There was an increase in muscle strength and joint flexibility [17, 21].

Patients can be offered different types of exercise, such as: aerobic, endurance, strength training [21]. The types of physical activity should be matched to the clinical form [10]. For example, in both patients with axial and peripheral forms, general exercise, increasing strength and flexibility, cardiorespiratory exercises, as well as group activities and balneotherapy and hydrotherapy will be effective, and in the axial form, in addition, postural exercises [10]. Resistance exercises, as well as cardiorespiratory exercises, appear to be particularly promising - in studies conducted, they mainly reduced cardiometabolic risk, but also had an effect on reducing disease activity [23].

Studies have also emerged to assess the safety of physical activity in patients with SD [24]. Concerns have been raised about whether high intensity exercise would exacerbate inflammation [24]. This was motivated by the risk of mechanical overload during exercise, which could translate into a later onset of the “intrinsic Koebner sign,” and by the fact that older studies suggested that physical activity could exacerbate the Koebner sign in patients with skin psoriasis [20, 24]. The latter finding has not been confirmed in more recent experiments [20]. In addition, it was taken into account that, unlike RA, tendinitis is often present in the tendon

attachments of the skin, which could theoretically be exacerbated by mechanical overload [24]. It has been shown that playing contact sports can exacerbate the symptoms of SD [20]. On the other hand, Thomsen et al. conducted an experiment in which participants in the study group underwent 11 weeks of high intensity interval training (HIIT) [24]. HIIT consisted of riding a stationary bicycle [24]. During a single session, patients first performed a 10-minute warm-up, followed by 4 rounds of 4 minutes each at 85-90% of the highest heart rate reached during maximal exercise (HRmax), which were punctuated by 3-minute intervals of riding at 70% HRmax [24]. Patients performed three workouts per week - two supervised by a specialist and one on their own [24]. Participants in the control group were asked to maintain their current habits [24]. Arthritis activity was assessed by joint ultrasound performed before the start of the workouts and after the experiment [24]. The severity of marrow edema in the sacroiliac joints was also assessed before and after the study [24]. HIIT was shown to be safe in patients with low to moderate disease activity and did not affect disease severity [24]. However, there are still conflicting data on the effect of physical activity on tendonitis, although it is thought not to cause significant exacerbations [17].

The effectiveness of resistance training was also studied [25]. In this experiment, too, patients were divided into a test group - which exercised twice a week and received standard pharmacotherapy - and a control group, which received treatment as usual [25]. Participants were assessed on the BASFI, BASDAI, DAS-28, HAQ-S, SF-36 scales, and the one-maximal repetition test was also considered [25]. Observations were made before the start of the study, then after 6 and 12 weeks [25]. It has been proven that this type of training improved patients' fitness and quality of life and reduced disease activity [25]. Clinical improvement was not directly proportional to increased muscle strength [25].

Physical activity may also have a beneficial effect on patients with psoriasis alone without arthritis [26]. These patients may also experience musculoskeletal pain and chronic fatigue [26]. To study the effect of physical activity on their severity, volunteers were divided into two groups [26]. Patients in the study group performed three workouts per week for 16 weeks, consisting of a warm-up, 35-50 minutes of running at an intensity of 50-65% HRmax on a treadmill, and cooling-down [26]. The control group did not increase their physical activity [26]. It has been shown that, relative to baseline scores on the Functional Assessment of Chronic Illness Therapy Fatigue Scale (FACIT-Fatigue), Health Assessment Questionnaire Disability Index (HAQ-DI) and Visual Analog Scale (VAS), patients improved significantly [26]. Lipid

profile and maximal oxygen consumption also improved, in addition, the percentage of body fat decreased [26]. However, no increase in muscle damage markers was observed [26].

Interestingly, the presence of psoriatic skin lesions also affects the type of physical activity chosen [20]. Many patients forgo sports that require exposure of a significant body surface, such as: swimming [20].

It should be remembered that in the treatment of SD, it is extremely important for physicians of different specialties, including rheumatologists and dermatologists, to work together with patients and to support patients in changing their previous, unfavorable habits [27]. Various types of projects are currently being developed to meet the needs and expectations of patients [27].

Summary

In conclusion, physical activity is safe and beneficial for patients with psoriasis and Psoriasis. Although its impact on health is not as well documented as in patients with RA and AS, it has found its place in the recommendations of the European League Against Rheumatism (EULAR). It is worth encouraging patients to take it because of its multifaceted impact on health and quality of life. To date, it has not been possible to create a single exercise plan that would be effective in all patients, so it is important to individualize therapy.

Author's Contribution

Conceptualization, methodology, software, check, formal analysis, investigation, resources, data curation, writing - rough preparation, writing - review and editing, visualization, supervision, project administration: Karolina Mikołajczak.

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