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The Impact of Physical Activity on Endometriosis Symptoms: A Literature Review

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Abstract

Introduction: Endometriosis is a benign proliferative disease characterized by the presence of endometrial tissue outside the uterine cavity. Some studies suggest that physical activity may have a positive influence on the symptoms of this medical condition.

Aim of the Study: The aim of this review is to assess whether physical activity has a beneficial effect on the symptoms of endometriosis and to identify potential knowledge gaps or limitations in the studies conducted so far.

Material and Methods: This review is based on studies identified through databases such as PubMed and Google Scholar, using the following search terms: "endometriosis and physical activity", "endometriosis and exercise" and "treatment of endometriosis".

Results: Three of the analyzed studies provided evidence supporting the hypothesis that physical activity has a positive impact on endometriosis symptom management, particularly in reducing pain. Two other systematic reviews did not reach clear conclusions, and one study did not find statistically significant evidence of a beneficial effect of exercise on endometriosis management.

Conclusions: The current literature does not provide consistent results regarding the impact of physical activity on endometriosis. Therefore, future studies, especially high-quality randomized controlled trials, are required to draw reliable conclusions.

Key words: endometriosis, physical activity, exercise

Introduction

Endometriosis is a common, benign, proliferative disease characterized by the ectopic growth of endometrial tissue. It affects approximately 10% (190 million) of women of reproductive age worldwide [1]. Endometriotic lesions are most commonly found on or around reproductive

organs such as the ovaries and fallopian tubes, on the surface of peritoneum, or within the uterine muscle (adenomyosis) [2, 3, 4]. However, lesions can also be located on other organs, including the uterosacral ligaments, gastrointestinal tract, bladder or even diaphragm and pleural surfaces [2, 4, 5].

Although the exact etiology of endometriosis remains unclear, proposed mechanisms include retrograde menstruation, immune dysfunction, and genetic predisposition. The most common clinical manifestations of endometriosis include chronic pelvic pain, intermenstrual bleeding, painful periods (dysmenorrhea), painful intercourse (dyspareunia), painful defecation (dyschezia), and painful urination (dysuria) [6, 7, 8, 9]. These symptoms significantly impair patients' quality of life [10, 11, 12, 13], underscoring the importance of appropriate treatment and comprehensive care for women with endometriosis. Current management strategies include pharmacological therapies, surgical interventions, and complementary approaches, including physical activity. [14, 15, 16, 17, 18]

The Potential Impact of Physical Activity on Endometriosis

Physical activity is often employed as an auxiliary therapeutic method in a variety of medical conditions. Therefore, it is reasonable to assume that women with endometriosis may also benefit from physical activity.

Based on the studies reviewed, several theories have been proposed to explain how physical activity may influence the progression of endometriosis and help relieve its symptoms. These mechanisms involve hormonal regulation, anti-inflammatory effects, improved immune function, and the release of endorphins that contribute to pain reduction.

One of the proposed theories supporting the positive impact of physical activity on endometriosis is based on the concept of skeletal muscles functioning as an endocrine organ. During muscle contractions, skeletal muscles produce, release and express cytokines such as IL-6, IL-8, IL-15, and other peptides classified as myokines, which may mediate anti-inflammatory effects not only locally but also systemically [19, 20].

Additionally, it is suggested that physical activity exerts anti-inflammatory effects through the increased release of epinephrine, cortisol, growth hormone, prolactin, and other factors that have immunomodulatory effects [20].

Physical activity also influences sex hormone levels by inducing a decrease in circulating hormones, particularly estradiol (one of the estrogens) [21]. This is especially important

because endometriosis is known to be estrogen-dependent, and estrogen contributes to inflammation, growth, and pain associated with the disease [1].

Another theory emphasizes the role of physical activity in pain reduction. Exercise triggers the release of β-endorphins from the pituitary gland and the hypothalamus, which, in turn, produce analgesic effects by activating μ-opioid receptors [22, 23].

Types of Physical Activity and Their Impact on Endometriosis Symptoms

Physical activity is increasingly recognized as a supportive element in the management of endometriosis. Women affected by this condition engage in various forms of exercise, and researchers are striving to evaluate the effects of different types of physical activity on endometriosis-related symptoms.

One of the most studied forms of exercise is yoga, which combines stretching, muscle strengthening, breathing techniques, and meditation. Studies by Gonçalves et al. [24] and Ravins et al. [25] have shown that regular yoga practice can significantly improve the quality of life in women with endometriosis. Specifically, yoga has been associated with a reduction in chronic pelvic pain [24] and lower back pain [25], as well as improvements in general well-being [24, 25] and a noticeable decrease in stress levels [25].

A randomized controlled trial conducted by Artacho-Cordón et al. [26] examined a comprehensive exercise program supervised by a trained physiotherapist. The program consisted of lumbopelvic stabilization training, stretching, aerobic, and resistance exercises focused on the lumbopelvic region. This study provides evidence that such an exercise intervention can significantly enhance the quality of life in women with endometriosis, particularly by reducing chronic pelvic and lumbar pain and improving mental health.

In contrast, a quasi-experimental study by Poli-Neto et al. [27] indicated that strength exercises (specifically, exercise sessions on an extensor chair) lowered the pain threshold in patients with endometriosis compared to healthy women and, in some cases, even intensified pain reception.

Despite the limited number of studies evaluating the influence of particular types of physical activity on endometriosis, current evidence indicates that the most beneficial forms are those that combine physical exercise with relaxation and meditation (such as yoga), along with professionally supervised, well-balanced training programs.

The Impact of Physical Activity on Endometriosis: Review of Current Evidence

In recent years, there has been considerable interest in assessing not only the effects of specific types of physical activity, such as yoga or strength training, but also the overall impact of physical activity on endometriosis as a broader therapeutic approach. The literature includes several systematic reviews and individual clinical studies that have examined this topic. Some authors highlight the benefits of regular exercise, while others do not confirm a significant effect of physical activity on the management of endometriotic symptoms. This chapter presents a review of key conclusions from selected studies.

A recent systematic review by Xie et al. [28] analyzed six randomized controlled trials involving a total of 251 women diagnosed with endometriosis. Two of these studies were included in a meta-analysis and indicated that regular physical activity can improve the overall quality of life in women with endometriosis, particularly by reducing pain and enhancing emotional health. Additionally, the review highlights that exercise may contribute to better pelvic floor function and support bone health.

A similar perspective is presented in another systematic review and meta-analysis conducted by Abril-Coello et al. [29]. Their analysis, based on six randomized controlled trials, supports the hypothesis that physical activity provides significant benefits in terms of pain management and physical functioning, indicating an improved ability to perform daily physical activities.

A prospective case-control cross-sectional study organized by Nati et al. [30] examined 46 patients diagnosed with endometriosis who underwent surgery. The results suggest that physical activity not only alleviates symptoms of endometriosis but may also reduce the severity of the disease, as assessed by the revised American Society for Reproductive Medicine (rASRM) staging system.

Conversely, a systematic review provided by Tennfjord et al. [19] did not reach such optimistic conclusions. After screening and assessing 1879 studies, only three met the inclusion criteria and were finally included in the review, involving a total of 109 women with endometriosis. Among these, only one study demonstrated a significant beneficial effect of physical activity on pain reduction, while another reported a positive impact on stress management. The authors of this review emphasized that most of the studies on this topic cannot be considered conclusive due to poor methodological quality.

Similar findings were reported in a systematic review by Hansen et al. [31], which evaluated six studies. Only two of these studies demonstrated that exercise helped alleviate pain related to endometriosis, while the other four did not support these results.

A systematic review by Mira et al. [32], which examined eight randomized controlled trials, did not find statistically significant evidence supporting a positive impact of exercise on symptom control in endometriosis. However, the authors noted some promising trends that warrant further investigation.

Taken together, the results from these studies indicate that physical activity may have potential benefits for women with endometriosis. However, the heterogeneity of study designs, exercise protocols, and outcome measures makes it difficult to draw definitive conclusions.

Discussion

The aim of this study was to analyze the impact of physical activity on endometriosis symptoms and to assess whether regular exercise may be an important factor in supporting disease management. Based on the available data, it can be observed that physical activity may have beneficial effects, both in terms of pain reduction and overall improvement in the quality of life among women suffering from endometriosis.

The literature highlights that women with endometriosis tend to lead more sedentary lifestyles and are less likely to engage in physical activity compared to women without this condition [33]. This is probably due to chronic pelvic pain, reduced motivation and depressed mood, all of which make physical effort more difficult to undertake.

Interestingly, some theories have suggested that regular exercise may help prevent the development of endometriosis. However, to date, studies have not confirmed these assumptions [34, 35]. Although the potential preventive role of physical activity seems biologically plausible due to its effects on hormone regulation and immune function, current evidence remains inconclusive.

After analyzing studies on the impact of physical activity on the management of endometriosis-associated symptoms, it can be observed that the majority of results indicate potential benefits of regular physical activity. Two systematic reviews [28, 29] and one prospective case-control cross-sectional study [30] consistently reported evidence suggesting that physical activity may contribute to pain reduction and improve the quality of life in women with endometriosis. Furthermore, some studies suggest that exercise may also have a beneficial effect on pelvic floor function, bone density, and may even potentially reduce the severity of the disease.

On the other hand, not all research equally supports the positive impact of physical activity in endometriosis management. The systematic reviews by Tennfjord et al. [19] and Hansen et al. [31] presented mixed results. While some of the studies analyzed by these authors confirmed the beneficial effects of exercise on pain reduction and stress management, others did not report significant improvements. These findings suggest that the current evidence remains inconclusive and may depend on factors such as study design, exercise protocols, or sample sizes.

At the opposite end of the spectrum is the systematic review by Mira et al. [32], which did not find statistically significant evidence supporting the effectiveness of physical activity in controlling endometriosis symptoms. Although the authors acknowledged some promising trends, the overall conclusions did not support the discussed hypothesis.

Authors of some of these reviews emphasized that conducting meta-analyses on a significant portion of the analyzed studies was impossible due to heterogeneity of outcome measures and issues with result reporting [19, 28, 31].

Moreover, the authors highlighted that objectively assessing the impact of physical activity on the course, severity, and symptoms of endometriosis is challenging due to several limitations in the existing studies. The main problems include poor methodological quality, the lack of standardized exercise protocols, inconsistent outcome measures related to pain perception, symptom management, well-being, and overall quality of life, as well as small sample sizes in both study and control groups [19, 28, 29, 31, 32].

As a consequence, further research, particularly high-quality randomized controlled trials, is essential to provide clear and reliable evidence on this topic.

Conclusions:

Endometriosis is a medical condition affecting millions of women globally, significantly impairing their quality of life. Therefore, the scientific community has long been trying to thoroughly investigate complementary approaches to treatment and symptom control of this disease. Several hypotheses have been proposed to explain the potential beneficial effects of physical activity on endometriosis, which has led to numerous clinical studies aiming to verify these theories in practice.

The studies analyzed in this review suggest that physical activity may have a positive impact on symptom management in women with endometriosis, particularly regarding pelvic pain reduction and quality of life improvement. Special attention should be given to activities that combine physical movement with relaxation, such as yoga, as well as physiotherapist-guided exercise programs, which appear to be especially promising. However, the available evidence remains inconsistent and limited due to methodological weaknesses in many studies. As a result, this topic is still insufficiently explored and requires further high-quality research.

As highlighted earlier, future studies on this topic should focus on conducting well-designed randomized controlled trials involving larger and more diverse study populations. It is also crucial to develop standardized exercise protocols and consistent outcome measures to enable reliable comparisons between studies and to draw coherent, evidence-based conclusions regarding the role of physical activity in the management of endometriosis.

Disclosure

Author's contribution:

Conceptualization and Methodology: KW, WK, MM, MS, KK, AM, MS, AH, MJ, MP

Investigation: KW, WK, MM, MS, KK, AM, MS, AH, MJ, MP

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Writing - rough preparation: KW, WK, MM, MS, KK, AM, MS, AH, MJ, MP

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reviewed and edited the content as needed and accept full responsibility for the substantive content of the publication.

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