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Benefits of Physical Exercise for Individuals with Primary Sjogren's Syndrome: A Systematic Report

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Introduction

Primary Sjögren's Syndrome (pSS) is a chronic autoimmune disease characterized by lymphocytic infiltration of exocrine glands, primarily affecting the salivary and lacrimal glands, leading to hallmark symptoms of dry mouth (xerostomia) and dry eyes (keratoconjunctivitis sicca). However, beyond glandular dysfunction, pSS is a systemic condition associated with widespread fatigue, musculoskeletal pain, joint stiffness, and a higher risk of cardiovascular disease, metabolic disorders, and mental health challenges such as anxiety and depression. Due to the progressive nature of pSS and the significant impact of symptoms on daily life, effective non-pharmacological management strategies are essential. Physical exercise has been increasingly recognized for its role in managing chronic autoimmune conditions by improving cardiovascular health, reducing inflammation, enhancing musculoskeletal function, and promoting psychological well-being. However, the effects of exercise in individuals with pSS remain an area of growing research interest, with ongoing investigations into its potential benefits and risks. This systematic review aims to evaluate existing evidence on the impact of physical exercise in pSS patients, assessing its effects on fatigue, physical function, quality of life, systemic inflammation, and disease progression [1].

Description

Fatigue is one of the most debilitating symptoms reported by pSS patients, significantly affecting daily activities and overall quality of life. While the exact mechanisms underlying fatigue in pSS remain unclear, contributing factors include immune dysregulation, chronic low-grade inflammation, autonomic dysfunction, and mitochondrial abnormalities. Studies have suggested that physical exercise, particularly aerobic and resistance training, may help alleviate fatigue by improving mitochondrial efficiency, enhancing oxygen utilization, and modulating inflammatory pathways. Several Randomized Controlled Trials (RCTs) and observational studies have explored the effects of structured exercise programs in pSS patients, with findings indicating potential improvements in fatigue levels, physical endurance, and psychological resilience. Despite these benefits, adherence to exercise regimens may be challenging due to exercise-induced discomfort, joint pain, and post-exertional fatigue, necessitating individualized exercise prescription and gradual progression [2].

Beyond fatigue, physical exercise has been investigated for its role in improving musculoskeletal and joint health in pSS patients. Given that pSS often coexists with fibromyalgia-like symptoms, characterized by widespread pain and muscle tenderness, targeted exercise interventions such as strength training, aquatic therapy, and low-impact aerobic exercises (e.g., walking, cycling, and swimming) have been proposed as potential strategies to enhance musculoskeletal function while minimizing joint strain. Resistance training, in particular, has been shown to improve muscle strength, flexibility, and balance, thereby reducing the risk of falls and functional impairment in pSS patients. Additionally, exercise-induced endorphin release may contribute to pain relief by modulating central pain processing mechanisms. However, variability in exercise response among pSS patients underscores the need for personalized exercise programs tailored to individual symptom profiles and tolerance levels [3].

In addition to its physical benefits, regular exercise is increasingly recognized for its positive effects on mental health in pSS patients. Chronic illness-related stress, social isolation, and depression are common among individuals with pSS, often exacerbated by persistent fatigue and physical limitations. Exercise has been well-documented to improve mood, reduce stress levels, and enhance cognitive function by stimulating the release of neurotransmitters such as serotonin and dopamine. Mind-body exercises such as yoga, tai chi, and Pilates have gained attention for their ability to combine physical movement with mindfulness-based stress reduction techniques, offering potential psychological benefits for pSS patients. Moreover, participation in group-based exercise programs may foster social support and motivation, thereby improving adherence and overall well-being. Another key area of interest is the impact of exercise on systemic inflammation and immune modulation in pSS. Chronic inflammation is a hallmark of autoimmune diseases, including pSS, with elevated levels of pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α), interleukin-6 (IL-6), and interferon-gamma (IFN-γ) contributing to disease pathogenesis and symptom severity [4].

Emerging research suggests that moderate-intensity exercise may have anti-inflammatory effects by promoting the release of anti-inflammatory cytokines (e.g., interleukin-10) and enhancing regulatory T-cell function, thereby potentially attenuating disease activity. However, high-intensity or excessive exercise may have the opposite effect, triggering oxidative stress and immune activation, highlighting the importance of balanced exercise regimens for pSS patients. Despite the growing body of evidence supporting the benefits of exercise in pSS, several challenges remain in its clinical implementation. Individual variability in disease presentation, exercise tolerance, and comorbid conditions necessitate personalized exercise recommendations to maximize benefits while minimizing adverse effects. Additionally, healthcare providers must consider factors such as patient motivation, accessibility to exercise facilities, and potential barriers to adherence when designing exercise interventions for pSS patients. Future research should focus on large-scale, well-designed RCTs to establish standardized exercise guidelines, optimize exercise prescriptions, and further elucidate the underlying mechanisms through which exercise influences disease progression and symptom management in pSS [5].

Conclusion

In conclusion, physical exercise holds promise as a valuable non-pharmacological intervention for individuals with primary Sjögren's syndrome, offering potential benefits in alleviating fatigue, improving musculoskeletal function, enhancing mental health, and modulating systemic inflammation. While existing evidence suggests that structured exercise programs, including aerobic, resistance, and mind-body exercises, may contribute to improved quality of life and physical well-being in pSS patients, individualized exercise prescription is essential to account for variations in symptom severity and tolerance levels. The integration of exercise into multidisciplinary pSS management strategies, alongside pharmacological treatments and lifestyle

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modifications, may offer a comprehensive approach to improving long-term health outcomes. Future research should continue to explore the optimal exercise modalities, intensity levels, and frequency for pSS patients while addressing potential barriers to exercise adherence. By fostering a better understanding of the role of exercise in pSS, healthcare professionals can empower patients with effective self-management strategies to enhance their overall well-being and disease management.

Acknowledgement

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Conflict of Interest

None.

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