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Case Report
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Impact of a Five-Year Clinical Pilates Intervention on Functional Mobility and Quality of Life in a 69-Year-Old Male with Idiopathic Inflammatory Myositis: A Case Study

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Abstract

Objective: The objective of this case study is to examine the effects of a structured Clinical Pilates (CP) intervention on functional mobility, balance, disability, quality of life, and selected biochemical markers in a 69-year-old male patient diagnosed with Idiopathic Inflammatory Myositis (IIM). Limited evidence regarding CP's potential to improve functional mobility, balance, and psychosocial well-being in this population underscores the urgent need for exploratory, patient-centered research to evaluate its efficacy as a targeted rehabilitative strategy.

Methods: Over five years, the patient participated in CP sessions guided by a certified instructor, focusing on controlled movement, fascial work, postural alignment, and neuromuscular activation. A detailed record of medications and the physicians managing the patient from diagnosis to the present was maintained. Serum CK was monitored from 2020 as the only longitudinal biochemical marker. Functional outcomes and quality of life were assessed using the Timed Up and Go (TUG), Short Form-36 (SF-36), and Health Assessment Questionnaire (HAQ-DI).

Results: Creatine Kinase levels stabilized and trended toward normalization without evidence of exercise-induced muscle damage. Questionnaires showed sustained improvements in mobility, functional strength, balance, and physical components of quality of life, while emotional and social well-being remained high.

Conclusion: Structured and tailored Clinical Pilates is a safe and effective intervention that complements medical management, enhancing functionality and quality of life in patients with IIM and highlighting the importance of patient-centered rehabilitation strategies.

Keywords: Functional Mobility; Myositis; Clinical Pilates

Introduction

Idiopathic Inflammatory Myositis (IIM) is a systemic autoimmune disorder characterized by chronic, immune-mediated inflammation of skeletal muscle fibers. This pathological process predominantly affects proximal muscle groups and leads to progressive weakness, pain, and substantial functional impairment due to immune-mediated muscle destruction [1]. Although the global prevalence of IIM is low, its clinical, psychological, and social impact is profound. Individuals with IIM commonly experience marked reductions in muscle strength, balance, and endurance, which in turn limit daily activities. As functional limitations progress, many individuals face reduced independence and diminished participation in meaningful occupational and social roles [2].

Current therapeutic approaches, including immunosuppressive treatments and multidisciplinary rehabilitation, have improved disease management but remain insufficient to fully restore physical function or prevent long-term disability. Persistent inflammation, reduced mobility, and diminished aerobic capacity continue to affect mobility and psychological resilience, often resulting in increased dependency, vulnerability, and social withdrawal [3]. Furthermore, emerging evidence on myositis-specific and myositis-associated autoantibodies points to complex immunological mechanisms that may contribute to variability in clinical presentation and treatment response [4], reinforcing the need for tailored, integrative rehabilitation strategies.

Beyond its physical components, Clinical Pilates (CP) integrates breathwork, concentration, and mindful movement, making it a potentially valuable tool for supporting psychological well-

being. Evidence suggests that CP enhances physical function, reduces pain, and improves quality of life in various musculoskeletal and chronic conditions [5, 6]. Combined interventions including CP have also shown positive effects on mood and psychological well-being, reinforcing its relevance as a multidimensional therapeutic method that supports both physical and emotional health [7]. As CP is increasingly recognized as a holistic approach that promotes body awareness, emotional resilience, and mind–body integration its principles align with contemporary recommendations for chronic disease rehabilitation [8, 9, 10].

Despite multidisciplinary management, current strategies for individuals with IIM remain insufficient to fully restore physical function or quality of life. Persistent inflammation, progressive muscle weakness, and reduced mobility not only impair bodily function but also increase psychological vulnerability, dependency, and social disengagement. In this context, CP emerges as a promising intervention; however, its application in IIM is largely understudied. The limited evidence regarding CP's potential to improve functional mobility, balance, and psychosocial well-being in this population underscores the urgent need for exploratory, patient-centered research to evaluate its efficacy as a targeted rehabilitative strategy. Therefore, the aim of this case report is to examine the effects of a structured CP intervention on functional mobility, balance, disability, quality of life, and selected biochemical markers in an individual diagnosed with IIM.

Case Report

Retrospective case study. A 69 year-old man with IIM, characterized by progressive muscle weakness, fatigue, and reduced functional capacity. The diagnosis was clinically confirmed through electromyography, muscle enzyme analysis, and elevated creatine kinase (CK) consistent with an inflammatory myopathy profile.

At the time of inclusion, the participant was under stable pharmacological management prescribed by a rheumatologist, including corticosteroid therapy and immunosuppressive medication. The individual also attended complementary rehabilitation therapies, such as physiotherapy, aimed at maintaining joint range of motion and muscle flexibility. Despite this multidisciplinary approach, functional limitations persisted, particularly in lower limb strength, postural stability, and endurance during daily activities.

The CP intervention was implemented as an additional rehabilitative strategy. The program aimed to promote neuromuscular activation, improve balance, and enhance quality of life within the participant's physical tolerance and medical safety parameters. After informed consent, the following evaluations were performed.

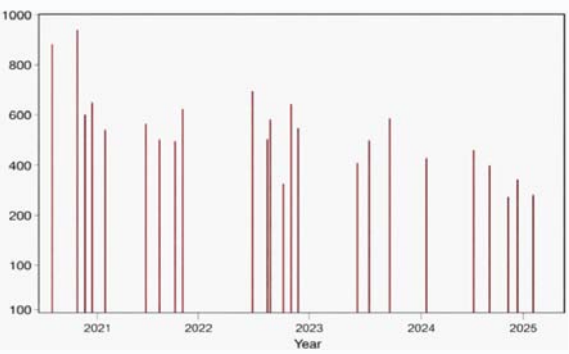

Figure 1: Longitudinal monitoring of serum creatine kinase (CK) levels from June 2020 to December 2025. The graph illustrates a progressive reduction and sustained stabilization of CK, reflecting improved biochemical muscle stability during the course of the structured Clinical Pilates intervention.

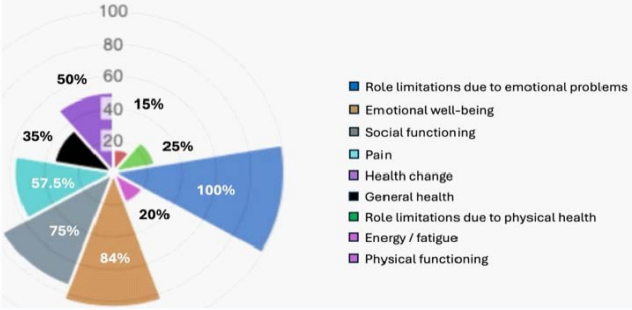

Figure 2: SF-36 Health-related quality of life (Visual Score %). Physical domains show marked impairment, while emotional and social domains remain preserved, highlighting maintained psychosocial function despite physical limitations.

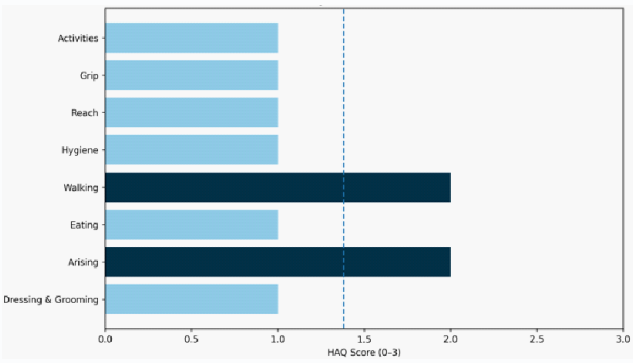

Figure 3: Health Assessment Questionnaire Disability Index (HAQ-DI) scores by functional domain. Domain scores range from 0 to 3, with higher values indicating greater disability. The dashed vertical line represents the overall HAQ-DI score (1.38), calculated as the mean of the eight domain scores. The y-axis shows the individual functional domains.

CP Intervention: The participant underwent a supervised CP intervention delivered by a certified instructor, with sessions conducted twice weekly lasting 1.5 hours. The program integrated fascia-oriented techniques with controlled CP exercises designed to enhance mobility, postural alignment, balance, pain modulation, and overall functional capacity. Sessions began with breathing strategies and gentle mobility exercises to facilitate neuromuscular activation and reduce cervical stiffness. The intervention progressed to targeted upper- and lower-limb exercises, including arm mobility work, controlled Cadillac-based movements, and progressive stretching and mobilization of the lower extremities, with particular emphasis on the more affected right leg. Coordinated shoulder, humeral, and scapular movements were incorporated to optimize postural control and minimize compensatory movement patterns.

Longitudinal monitoring of serum CK: Measurement of serum CK from June 2020 to December 2025 demonstrated a substantial and sustained reduction in muscle enzyme concentrations (Figure 1). Initially, CK levels were markedly elevated, reflecting active muscle inflammation, with values exceeding 800 U/L in 2020. Between 2020 and 2022, CK concentrations remained persistently above the upper reference limit, indicating ongoing disease activity. From 2023 onward, a progressive decline in CK levels was observed, with

intermittent normalization during 2024 and sustained near-normal values throughout 2025. This longitudinal trend suggests biochemical stabilization of muscle involvement without evidence of exercise-induced exacerbation.

Functional mobility. Evaluated using the Timed Up and Go (TUG) test, demonstrated improvement, with a completion time of 11.97 seconds. This performance falls below the threshold typically linked to elevated fall risk in community-dwelling older adults, reflecting enhanced dynamic balance, postural control, and lower-limb functional strength, and reinforcing the patient's capacity to perform essential mobility tasks independently.

Health-related quality of life. Evaluated using the Short Form-36 (SF-36), revealed a distinct contrast between physical and psychosocial domains (Figure 2). While physical functioning, role limitations due to physical health, and vitality were markedly reduced, emotional and social domains demonstrated notably high scores. Role Limitations due to Emotional Problems reached the maximum value, indicating no perceived interference of emotional factors with daily roles. Emotional Well-being was high, reflecting psychological stability and positive mental health, while Social Functioning scores indicated sustained engagement in social activities despite physical limitations. These findings highlight preserved emotional resilience and social participation in the context of chronic physical impairment.

Functional disability. Assessed using the Health Assessment Questionnaire Disability Index (HAQ-DI), yielding a score of 1.38, indicative of moderate impairment in activities of daily living. The highest limitations were evident in the walking and arising domains, highlighting significant challenges in mobility, transfers, and independent functioning. These findings underscore persistent functional deficits despite preserved psychosocial well-being, emphasizing the need for targeted rehabilitative strategies to enhance lower-limb performance and overall independence (Figure 3).

Discussion

This case report adds novel evidence to the limited rehabilitation literature in IIM by documenting the application of a structured CP intervention in a real-world clinical context. A key strength of this study is its comprehensive, patient-centered approach, integrating biochemical markers, functional performance, and validated patient-reported outcomes in accordance with CARE guidelines. The findings suggest that CP may represent a safe and feasible adjunct to medical management in IIM.

It has been reported that CK, a key biomarker of muscle damage in inflammatory myopathies, demonstrated a progressive decline to near-normal and normal values and remained stable throughout the intervention period. The absence of exercise-induced CK elevation supports existing evidence that carefully monitored low- to moderate-intensity therapeutic exercise is safe for individuals with IIM [11]. These findings are consistent with previous studies reporting improvements in aerobic capacity, muscle metabolic efficiency, and reduced susceptibility to muscle damage following structured endurance exercise in patients with polymyositis and dermatomyositis [12].

Present results in TUG performance indicate meaningful gains in functional mobility, balance, and lower-limb strength. A completion time below established fall-risk thresholds reflects enhanced postural control and neuromuscular coordination, which are central rehabilitation goals in inflammatory myopathies. Clinically, these improvements suggest greater independence in activities of daily living and a reduced risk of falls, reinforcing the potential of low-impact, individualized interventions such as CP to safely enhance mobility without exacerbating muscle inflammation [13].

In addition, patient-reported outcomes in SF-36 revealed a clear divergence between physical and psychosocial domains. While physical functioning and vitality remained substantially impaired, emotional well-being, role limitations due to emotional problems, and social functioning were notably preserved. These findings suggest that supervised mind–body-based exercise such as CP may support psychological resilience, self-efficacy, and social participation despite persistent physical limitations. The intervention's emphasis on controlled movement, neuromuscular coordination, postural alignment, and symptom-tolerant progression aligns with established physiotherapy principles for chronic inflammatory muscle diseases [14].

Despite the fact this is a single-patient case and the use of a single assessment time point for functional and questionnaire-based outcomes, given the rarity of IIM, a single-case reports provide valuable preliminary insights that can inform future research. Longitudinal are warranted to confirm these findings and to explore the long-term impact of CP on functional capacity, muscle biomarkers, and quality of life. Within this framework, CP emerges as a promising, individualized rehabilitation strategy with potential benefits for functional recovery and psychosocial well-being in patients with IIM.

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