

Role of Physiotherapy and Physical Agent Modalities for Musculoskeletal Disorders: Present and Future

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1. Introduction

Musculoskeletal disorders are believed to be the second most frequent cause of disability worldwide [1]. Pain management focuses on pharmacological interventions for musculoskeletal and temporomandibular disorders (TMD); nevertheless, the functional consequences of chronic pain have frequently been underestimated and therefore under-treated [1,2]. In this scenario, physical therapy and physical agent modalities (PAMs) have been combined with drug therapy since the dawn of rehabilitation approaches, allowing for a more prudent management even for the most fragile patients [3]. PAMs are administered by physiatrists and physical therapists to provide an additive therapeutic effect, gaining increasing attention in the scientific literature, not only in terms of musculoskeletal pain relief but also in terms of promoting pain-free functional recovery, particularly if associated to physical exercise [3,4]. Thus, in light of recent technological advances, the advantages of PAMs could play a crucial role in a patient-tailored musculoskeletal rehabilitation also in terms of reducing muscle and nerve lesions, that could be obtained not only by pharmacological drug assumption or infiltrations. [3–6]. Starting from the clinical evidence, PAMs could be useful to counteract musculoskeletal pain disorders, helping the patient to achieve the greatest possible functional recovery [3–6].

To address these needs, the Special Issue “Role of Physiotherapy and Physical Agent Modalities for Musculoskeletal Disorders: Present and Future” aimed to gather recent advances to better understand the efficacy, safety and possible contraindications of each modality. Therefore, this Special Issue provides a broad and clear overview of the effectiveness of PAMs in the musculoskeletal rehabilitation field.

2. New Perspectives for Physical Agent Modalities for Musculoskeletal Disorders

Six papers [7–12] were published from December 2021 [12] to September 2022 [10] in the Special Issue “Role of Physiotherapy and Physical Agent Modalities for Musculoskeletal Disorders: Present and Future”. Concerning the study design, there were the following: one umbrella review meta-analysis [7], two scoping reviews [8,9], two original papers [10,11] and one case report [12].

To ensure the best possible treatment of patients suffering from musculoskeletal and rheumatic diseases, the combination of different rehabilitation modalities could also be associated with balneotherapy including several therapeutic exercise protocols, thus representing an effective multimodal strategy [8]. These positive properties might be the result of a combination of mechanical (hydrostatic force) and thermal (mineral water or mud temperature) effects. In fact, thermal water immersion might increase buoyancy, leading to a non-bearing effect, while hydrostatic pressure might provide a helpful result in pain relief, and joint and muscle function.



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Presently, all existing treatments for fibromyalgia are generally focused on relieving patients' symptoms and enhancing their quality of life [9]. Therefore, whole-body cryostimulation (WBC), used primarily in sports medicine [13], appears to help reduce pain and inflammatory symptoms in these patients; despite the small amount of evidence in the literature, Fontana et al. [9] suggested that WBC may be incorporated into fibromyalgia management, due to its rapid effect, high patient compliance and PAM cost effectiveness [14]. Finally, WBC has the capabilities to be integrated into and perhaps enhance current programs of rehabilitation in patients with fibromyalgia.

The disabling condition complex regional pain syndrome (CRPS) type 1 is a rare but painful disorder, usually involving the distal extremities such as the wrist, hand, ankle and foot due to either direct or indirect traumas [15]. In this context, Ryskalin et al. [10] demonstrated that the rehabilitation protocol must be personalized and focused on the specific stage of the disease, as well as being promptly adapted to patients' needs, tolerability and different clinical manifestations [2]. The treatments must be complementary and sequential to obtain the maximum benefit, accompanying the patient throughout the course of the disease, comprising mirror therapy for brain functional reprogramming, physical therapy with transcutaneous electrical nerve stimulation (TENS), pain desensitization techniques and the pulsating electromagnetic field technique [10].

Extracorporeal shockwave therapy (ESWT) is a PAM that produces three-dimensional pressure pulses, lasting microseconds with a peak pressure of 120 MPa, able to generate different effects, depending on the intensity, pulse cycle and shockwave modality [16]. In this scenario, radial ESWT (r-ESWT) is a pneumatic pressure PAM with a straight mechanical pulse, which develops power on the skin, but then diffuses the energy radially into the tissues [11]. Focused ESWT (f-ESWT) is progressively expanding its field of application to many musculoskeletal pathologies [17]. Tognolo et al. [12] showed that f-ESWT for the treatment of ligament injury could represent a reliable and safe mild energy shockwave therapy for the management of nonsurgical injuries. Furthermore, it can become easy to approach with the assistance of ultrasound guidance in diagnosis, and the effect of ESWT during the follow-up period can also be easily evaluated.

Marotta et al. [11] reported that ESWT could be considered a favorable treatment for pain relief in patients with TMD, a clinical condition that might be also correlated with other chronic diseases (headache, fibromyalgia, obstructive sleep apnea, etc.) [18–20]. In this scenario, the authors showed that r-ESWT combined with physical therapy appeared to be an active treatment in pain relief, consequently suggesting the requirement to outline a tailored rehabilitation plan, including physical therapy and other interventional PAMs, such as r-ESWT, in patients affected by musculoskeletal disorders.

Lastly, plantar fasciitis is the most common cause of heel pain in adults; in this regard, Agostini et al. [7] reported, in an umbrella review, that ESWT could be efficient in pain relief beyond the different parameters set for shockwave delivery in comparison with controls.

3. Conclusions

In conclusion, the recent advances in PAMs for patients affected by musculoskeletal disorders have brought considerable challenges to clinical rehabilitation practice. The articles in this Special Issue have provided a comprehensive account of the rehabilitation demands of patients with complex diseases such as fibromyalgia and CRPS and refined the rehabilitation frameworks of more frequently recurring disorders such as TMD, plantar fasciitis and rheumatic diseases. Contributions from researchers and physicians from around the world emphasize the extent of a cooperative effort to associate and combine different PAMs in order to enhance the rehabilitation role of these techniques.

This Special Issue might act as a useful resource for physicians and physical therapists, which could provide more personalized and effective rehabilitation approaches, improving the health and quality of life of people affected by musculoskeletal disorders.

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