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The Role of Physical Medicine and Rehabilitation in the Management of Multiple Sclerosis: A Review of the Literature

M Mechtoune, M Ammari, V Tendart, H Mounguengui, A Gervais, M Sylla, T Hammani, M Daimi, M Diakhate and S Khalfaoui*

Physical and Rehabilitation Medicine Department, Mohammed V Military Hospital, Rabat, Morocco

SUMMARY

The progression of multiple sclerosis, whether treated or not, can sooner or later lead to the onset of disability that is not limited to locomotor disorders alone, despite therapeutic advances. Generated by years of relapses, followed by the insidious but continuous onset of motor, sensory, cerebellar, sensory or cognitive deficits, the consequences are physical, psychological and even socio-economic, and include functional rehabilitation, the efficacy of which now seems to be well established. Various types of treatment are available, involving a wide range of healthcare professionals (physiotherapists, occupational therapists, nurses, psychomotor therapists, orthoprosthetists, speech therapists, etc.), coordinated by a doctor specializing in physical medicine and rehabilitation. Programs are usually multidisciplinary, including rehabilitation techniques, functional exercises and even exercise training.

***Corresponding author**

S Khalfaoui, Physical and Rehabilitation Medicine Department, Mohammed V Military Hospital, Rabat, Morocco.

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Introduction

Multiple sclerosis (MS), an autoimmune inflammatory demyelinating disease of the central nervous system, affects around 1.3 million people worldwide. It is a major cause of chronic neurological disability in young adults (aged 18-50), associated with complex handicaps including strength, balance, sensory and cognitive motor disorders, as well as visual and emotional deficits. These disabilities generally lead to progressive limitation of daily functionality, requiring longer-term multidisciplinary management [1].

In most patients, the disease begins around the age of 30 with acute episodes of neurological dysfunction, followed by periods of partial or complete remission, with clinical stability between relapses. Except in patients with the relapsing-remitting form of multiple sclerosis, this phase is generally followed by progressive clinical disability, with or without superimposed relapses and remissions. In a minority of patients, the disease is progressive from the outset, although there may be superimposed relapses and remissions. Consequently, neurological disability may result from relapses with incomplete remissions, disease progression, or both [2].

To date, no single pharmacological treatment is available to cure MS. Current treatment strategies focus on slowing disease progression in order to maintain the functional status of MS patients by providing pharmacological treatment in combination with (multidisciplinary) rehabilitation. Various reviews of the MS literature have indicated the efficacy of rehabilitation strategies such as physiotherapy, cryotherapy, physical training, and multidisciplinary therapy [3].

The Benefits of Functional Rehabilitation in SEP

Fatigue

Even if the definition and pathophysiology of fatigue in MS remain controversial, and despite the paucity of objective markers correlating with the subjective sensation of fatigue, analysis of the data in the literature shows the importance of its detection and management, and enables us to propose therapeutic strategies. Beyond the traditional strategies of energy conservation and cooling techniques, several randomized studies have shown the positive impact of aerobic exercise [4].

Walking and Balance

Poor balance contributes to mobility problems. However, reducing fatigue and tremors and increasing endurance can help. Vestibular rehabilitation attempts to help patients adapt to balance problems. Specific interventions for balance and gait depend on the specific impairments contributing to the problem [5].

Jeffrey et al attempted in a randomized controlled trial to investigate the benefits of implementing a vestibular rehabilitation program with the aim of reducing fatigue and improving balance in MS patients [6].

They found that a 6-week vestibular rehabilitation program (55minute per day) demonstrated statistically significant and clinically relevant changes in fatigue, altered balance and disability due to vertigo or imbalance in MS patients [6].

Fuller et al aimed to determine whether a single inpatient admission for physiotherapy in chronic multiple sclerosis (MS) would improve mobility and activities of daily living related to the home environment. They failed to detect any objective improvement in mobility or activities of daily living (ADLs) related to inpatient physiotherapy, patients clearly experienced

a reduction in distress associated with mobility problems [7].

Spasticity as Part of Motor Disorders

Spasticity is a fairly frequent symptom in MS. The latest recommendations specify first-line treatment: botulinum toxin A for focal spasticity, and baclofen for diffuse spasticity. However, rehabilitation remains indicated [8].

Neuromotor rehabilitation uses Bobath and Kabat techniques to facilitate voluntary movement by inhibiting the spasticity that opposes movement. Brar et al measured spasticity in 30 ambulant MS patients taking part in a 10-week program combining stretching, oral Baclofen and placebo. The Baclofen alone and Baclofen plus stretching groups showed significantly greater improvements than the placebo group, with a potentiating effect of Baclofen plus stretching [9].

In an uncontrolled trial, Rodgers et al analyzed spasticity in 18 MS patients following a specific rehabilitation program. They found an improvement in joint amplitudes of abduction, adduction and external rotation of the hip, and better relaxation of the sural triceps [9].

Cognitive Rehabilitation

Cochrane reviews have historically reported a "low" level of evidence for cognitive rehabilitation in MS, based on the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) system. Note that these reviews included both RCTs (randomized controlled trials) and quasi-RCTs, which may have affected the overall grading of evidence. The last two Cochrane reviews, focusing on memory rehabilitation programs, concluded that there is evidence to support the efficacy of memory rehabilitation paradigms on self-reported and objective memory measures, as well as on quality of life. The latest Cochrane review, in particular, noted substantial progress in memory rehabilitation in MS and found significant and lasting post-intervention improvements [10].

Effect of Cryotherapy on SEP PEC

There is a consensus that higher temperatures can worsen MS symptoms, so cryotherapy can have a beneficial effect.

Ben et al found in a study of 10 MS patients that cold baths proved to be a valuable adjunct in the treatment of chronic multiple sclerosis patients. The simple measure of immersing patients in water at a temperature of 80 degrees F (27 degrees C) for a period of 10 minutes appeared to provide a material benefit in improving neuromuscular coordination. All patients reported a feeling of relaxation with fewer muscle spasms and greater ease when sitting or standing. Three of the 10 patients showed an immediate and rather remarkable increase in their ability to walk after the cold baths. Four of the patients showed a minor improvement in that they could stand straighter in the parallel bars and seemed to have less heaviness in their lower limbs. The other 3 patients showed no objective signs of improved ability, but reported feeling relaxed. The technique used involves filling the Hubbard tank with water at around 80 degrees F. The patient is lowered into the Hubbard tank, and the agitators are activated for a period of 10 minutes. The patient is encouraged to move as much as possible in the water. At the end of the 10-minute period, the patient is removed from the water, dried, dressed [11].

A cooling system (Microclimat Mark VII System) was used to administer two daily 45-minute cool-downs to six heat-sensitive multiple sclerosis patients over a one-month period. Before the first cooling, a baseline clinical and electrophysiological examination was performed. The same tests were repeated after the first application and after the thirtieth day of cooling, providing information on acute and chronic efficacy. Clinical improvement was observed after acute cooling and, more unexpectedly, after chronic cooling, while a significant improvement in central somatosensory conduction was recorded only under acute conditions. Our data suggest that cooling with this device leads to an improvement in certain functional performances (mainly fatigue and strength) of around two hours in heat-sensitive patients [12].

The Role of Multidisciplinary Rehabilitation

Multiple disciplines include nursing, occupational therapy, psychomotor therapy, speech therapy, orthoprosthetics and psychology.

The occupational therapist's intervention is based on a medical prescription, and initially carries out assessments to evaluate deficits and needs, with the aim of proposing personalized rehabilitation. This rehabilitation is based on exercises, activities of daily living and real-life situations to improve functions such as strength, dexterity, precision, writing and so on.
balance, movement and transfers [13].

Occupational therapists also have a role to play in proposing adapted equipment, technical aids and environmental adaptations to compensate for the handicap, always aiming for maximum independence and autonomy. The occupational therapist advises, accompanies and supervises equipment trials at the center and at home, in real-life situations, in conjunction with a medical equipment supplier and the social service. A wide range of technical aids is available, covering everyday activities such as washing, dressing, cooking, etc., as well as leisure activities. Access to multimedia and new technologies is also one of the areas covered. In which the occupational therapist can intervene [13].

The psychomotrician can discuss the experience of the disease with the patient. Self-esteem and body image can quickly become negative, hindering the person's leisure activities and activities of daily living. Sessions based on self-esteem and body expression can help to improve the patient's self-esteem. accept the situation created by illness. Relaxation, in the broadest sense of the term (sophrology, touch-massage, etc.), can also be useful in such circumstances [13].

Some walking defects require more specific equipment. In the case of multiple sclerosis, these are mainly foot-lift orthoses. When the anomaly is more complex (recurvatum of the knee, for example) or the anatomy of the lower limb a little atypical, it may be necessary to call on the services of an orthoprosthetist who will make a molded orthosis, such as a carbon-fiber foot lifter, an articulated crural-pedal orthosis, etc [13].

The speech therapist intervenes in swallowing disorders and dysarthria. Rehabilitation will initially focus on raising awareness of swallowing mechanisms. Understanding these, These mechanisms enable the patient to remain vigilant, to better understand a dysfunction and to allay any fears linked to false routes. Praxis training will be systematically implemented, with the learning of airway protection maneuvers (apnea, forceful swallowing, chin down...). These maneuvers should be adapted according to the patient's motor and cognitive abilities. The speech therapist will advise the patient on appropriate posture and a calm environment. He or she may recommend the use of specific equipment (straws, nose-cutting glasses, special cutlery, etc.),

and advise the use of caregivers in cases of greater dependence. Meal splitting can help to avoid end-of-meal false routes due to fatigue [14].

In the case of dysarthria, the aim is to set up means of compensation through work focusing on articulation, breathing (in collaboration with the physiotherapist), voice, prosody and the flow, praxis and relaxation. Emphasis is placed on certain points depending on the type of dysarthria (spastic, ataxic) [14].

Psychological follow-up need not be compulsory, but can be a valuable aid in supporting the patient, as the unpredictability of MS leads to a feeling of helplessness. and injustice, in the face of intermittent, random symptoms with no real possibility of control... There is a real anxiety-inducing effect of negative identifications with known, severely affected people. It is important to help patients free themselves from these identifications by insisting on the singular, case-by-case nature of the disease. The loss of functional abilities affects self-confidence and self-image. It's a real narcissistic wound. Feelings of devaluation in relation to oneself and to others, accentuated by progressive dependence on others, can be experienced [14].

Fary Khan et al found "strong evidence" that multidisciplinary rehabilitation can produce short-term gains in activity impairement (disability) and participation for MS patients. There is "moderate evidence" supporting multidisciplinary rehabilitation programs, whether inpatient or outpatient (compared with wait-list control groups), to improve disability, bladder-related activities and participation up to 12 months after rehabilitation intervention. This updated review reinforces the body of evidence in favor of inpatient multidisciplinary rehabilitation programs [15].

The Benefits of Exercise in SEP

Recently, the increase in studies showing the clinical efficacy of different forms of rehabilitation has changed our view of exercise, transforming it into a therapeutic approach rather than a preventive or symptomatic one.

In a systematic review, Rietberg et al (Nine trials, n = 260 participants) reported strong evidence in favor of exercise-based rehabilitation in terms of improvements in muscle power, exercise tolerance and mobility-related activities. There was moderate evidence of improvement in mood, but not in fatigue management. There was no evidence of deleterious effects of exercise therapy. Another meta-analysis assessed the beneficial effect of exercise training on walking/mobility in multiple sclerosis patients. A greater effect was associated with supervised training, exercise programs lasting less than 3 months and a mixed group of patients with relapsing/remitting and progressive multiple sclerosis.

A randomized controlled trial (RCT) by Dalgas and colleagues showed that progressive resistance training over 12 weeks was well tolerated and significantly improved functional capacity and strength, inducing a compensatory increase in muscle fiber size. These functional benefits persisted over 24 weeks, indicating a long-term benefit of physical training in multiple sclerosis.

In another study, Rasova et al found that, from a neurophysiological point of view, physiotherapy-based or combined training (physiotherapy plus aerobic training) was associated with a significant improvement in impairments and fatigue, whereas aerobic training only led to an improvement in certain spiroergometric parameters. Formal instruction in an efficacy-enhancing exercise condition was also found to be beneficial for exercise adherence, well-being and affective responses to exercise in MS patients.

Generally, moderate exercise intensity is recommended for people with MS. However, isolated studies show that high-intensity resistance training and high-intensity aerobic training are safe and can lead to even better improvements in many aspects of function, including measures of fatigue in people with MS. In fact, some studies have presented reductions in fatigue in the FSS (fatigue severity scale) or MFIS (modified fatigue impact scale) after the application of aerobic exercise programs.

Some studies indicate a positive influence of aquatic exercise on MS-related fatigue. This method also offers ideal relief and resistance for light muscle-strengthening exercises. The added benefit of exercising in water is a feeling of safety in the event of loss of balance and risk of falling, thanks to the immersion effect and reduction in body weight, as well as the muscle-relaxing effect of the warm water. What's more, the right temperature in the aquatic environment has a muscle-relaxing effect. It has also been shown that patients practicing yoga under the supervision of a qualified instructor had lower MFIS scores after 8 weeks of three yoga sessions per week.

Conclusion

The effects of rehabilitation are therefore positive on the functional capacities of MS patients, and adapted physical exercise and exercise re-training programs have shown remarkable results in this pathology, with no risk of disease exacerbation.

In the future, rehabilitation should no longer be limited to the care of severely disabled patients, but should be offered at an earlier stage, or even as soon as the pathology is diagnosed, in order to have a preventive effect on symptoms and their consequences.

Conflict of Interest: none

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