Therapeutic Yoga: Symptom Management for Multiple Sclerosis

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Abstract

Multiple sclerosis (MS) is the most common autoimmune inflammatory demyelinating disease of the central nervous system, affecting over 2.3 million people worldwide. According to the National Institute of Neurological Disorders and Stroke, the age of disease onset is typically between 20 and 40 years, with a higher incidence in women. Individuals with MS experience a wide range of symptoms, including declining physical, emotional, and psychological symptoms (e.g., fatigue, imbalance, spasticity, chronic pain, cognitive impairment, bladder and bowel dysfunction, visual and speech impairments, depression, sensory disturbance, and mobility impairment). To date, both the cause of and cure for MS remain unknown. In recent years, more individuals with MS have been pursuing alternative methods of treatment to manage symptoms of the disease, including mind-body therapies such as yoga, meditation, breathing, and relaxation techniques.

It has been suggested that the practice of yoga may be a safe and effective way of managing symptoms of MS. Therefore, the purpose of this paper is to summarize the most relevant literature on exercise and mind-body modalities to treat MS symptoms and, more specifically, the benefits and potential role of yoga as an alternative treatment of symptom management for individuals with MS. The article also discusses future directions for research.

Introduction

MULTIPLE SCLEROSIS (MS) is a progressive neurologic disease that targets the central nervous system (CNS). Categorized as an autoimmune disease, MS causes inflammation, demyelination, and scarring (sclerosis) in the white matter of the brain and spinal cord.^{1,2} Although the cause of MS remains unknown,³ it is believed that the immune system attacks and damages the myelin sheath (the fatty substance covering the brain, spinal cord, and optic nerve) and the axons in the CNS, which then prevents nerve impulses from traveling to and from the brain and spinal cord.^{4,5} The prevalence estimates of MS vary geographically; however, the current estimates for the United States indicate that 400,000 Americans have MS, with an incidence of 200 newly diagnosed cases per week.⁶ MS typically is diagnosed between the ages of 20 and 40 years and is currently the most common cause of acquired neurologic disability among women.⁷

MS is categorized by four common patterns, typically defined by relapse.⁶ The most common pattern of MS is relapsing-remitting, which is characterized by the sudden worsening of symptoms or the appearance of new symptoms

(referred to as an exacerbation, relapse, flare-up, or attack).⁷ This is followed by a period of improvement (remission), which may include complete or partial recovery from MS symptoms; the exacerbation may range from mild to severe, with a typical duration lasting from a few days to several weeks.⁶ This form of MS affects approximately 80%–90% of individuals diagnosed with MS. Most individuals initially diagnosed with relapsing-remitting MS will eventually enter into a second progressive phase of MS: secondary progressive MS. This form is characterized by a steady worsening of the disease with or without occasional relapses and is widely believed to result in the greatest neurologic disability. Primary progressive MS represents approximately 10% of cases at the onset of the disease and is characterized by a steady disease progression and decline in function from onset, with no acute attacks or remissions.^{6,7}

MS symptoms include fatigue, imbalance, spasticity, chronic pain, cognitive impairment, bladder and bowel dysfunction, visual and speech impairments, depression, sensory disturbance, and impaired mobility.^{5–8} It is estimated that up to 90% of individuals with MS experience impaired mobility, 75%–95% experience fatigue, and over 85% experience chronic pain.⁹ Moreover, individuals with MS report high

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levels of stress, anxiety, and depression, independent of specific physical disability.⁸ The symptoms and experiences of individuals with MS vary widely and are unique to each individual. Symptoms can range from mild to progressive physical and neurologic impairment.⁹ There is no known cure for MS,² and no approved treatment directly reduces the CNS damage or facilitates repair.⁵

A variety of drugs and therapies exist, which are designed with the goal of improving symptoms, slowing effects of the disease, and improving quality of life.¹⁰ Unfortunately, several of the medications used to treat MS result in adverse effects, ranging from fever, nausea, asthenia, and allergic reactions to more severe effects, including skin cancer, leukemia, and cardiac toxicity.¹¹ In response to existing adverse effects of known medications, many individuals with MS are choosing alternative methods to treat and manage symptoms, including various forms of exercise. One exercise regimen that has been popular in symptom management is the use of mind-body modalities, such as yoga, meditation, breathing, and relaxation techniques.^{10–13}

Therefore, the primary aim of this paper is to highlight the most relevant literature on exercise regimen of mind-body modalities as a form of treatment for MS symptoms in general and, specifically, the practice of yoga, the benefits and positive outcomes associated with yoga, current therapeutic uses of yoga, and the application of yoga as a complementary alternative treatment for symptom management of MS.

Benefits of Exercise

Before 1990, individuals with MS were not encouraged to participate in physical exercise; the common belief was that exercise exacerbated symptoms and especially fatigue associated with MS.^{3,13,14} Physicians prescribed bed rest for newly diagnosed persons in an attempt to prevent or shorten the duration of an attack and to facilitate recovery.^{13,15} During the past two decades, however, research has identified several forms of exercise with physical, emotional, and psychological benefits to individuals with MS, including Pilates,^{16–19} yoga,^{10,12} aquatics,¹⁹ endurance training,^{3,20} strength and cardiorespiratory training,²¹ walking,²² aerobic exercise,²³ and resistance training.^{24–26} Exercise is now considered to be well tolerated for individuals with MS and is commonly recommended for improved physical and emotional functioning.^{3,14}

For example, Guclu-Gunduz and colleagues¹⁷ investigated the effects of an 8-week program of Pilates, a type of mind-body exercise, on balance, mobility, and strength among 26 ambulatory adults with MS. They found significant improvements among all primary outcomes for those individuals in the Pilates group compared with the control group. In another study, van der Linden et al.¹⁸ explored the experiences of 15 individuals with MS who used a wheelchair. Findings suggested that Pilates was a safe and feasible form of exercise for people with MS, resulting in decreased back and shoulder pain and improved sitting balance. In addition, the participants who completed the 12-week Pilates program attributed various functional, physical, psychological, and social benefits to the program, as well as reporting a desire for continued participation.

A study conducted by Skjerbaek et al.²⁰ tested the feasibility of upper-body endurance training among 11 individuals with progressive MS who were significantly affected

by the adverse effects of the disorder. The researchers found that endurance training could be performed at sufficient intensity to procure cardiovascular adaptations and therefore was feasible for individuals with progressive MS.

In 2014, Leavitt and colleagues²³ reported on the effects of aerobic exercise on hippocampal volume and increased memory among individuals with MS who experienced memory impairment (50% of patients with MS have memory impairment due to hippocampal atrophy). After the exercise intervention (30-minute sessions three times per week, for 3 months), hippocampal volume increased by 16.5% and memory improved by 53.7% in patients with MS. Thus, this study provided the first evidence that aerobic exercise improved hippocampal volume, connectivity, and memory in MS. In fact, the results from of his study suggested that exercise might be the first effective memory treatment for individuals with MS.

Mind-Body Therapies for MS

More recently, a growing number of individuals have turned to mind-body therapies—a specific exercise regimen including yoga, mediation, relaxation techniques, breath work, visual imagery, hypnotherapy, and biofeedback—to manage symptoms of MS.^{27–33} For example, Yadav and colleagues³² conducted a survey with 1110 patients with MS. Thirty-two percent reported both highly perceived psychological and physical benefits to using mind-body modalities, such as yoga, meditation, relaxation techniques, and breathing. In another study, Nayek et al.³⁰ gathered data from 11,600 individuals with MS and found that 57.1% of the responding sample had used at least one form of complementary and alternative medicine (CAM), citing a general preference for alternative mind-body therapies. Similarly, Esmond and Long³³ examined the use of six CAM mind-body modalities for MS symptom management (i.e., reflexology, massage, yoga, relaxation and meditation, acupuncture, and aromatherapy). The results showed that 84% of the participants in this study had used at least one of these therapies to manage their symptoms of MS in the past year. The most mentioned benefits of these mind-body modalities included enhanced relaxation, reduced pain, reduced spasms, improved balance, improved sleep, and increased sense of well being.

Therapeutic Yoga

One mind-body therapy that has received considerable interest and attention is the practice of yoga. Now recognized in the Western world as a more holistic and comprehensive approach to health, yoga is practiced by an estimated 15.8 million Americans.¹⁰ The ancient practice of yoga started in India over 5000 years ago. The term *yoga* is derived from the Sanskrit word *yukti*, meaning “union of body, mind, and spirit.”¹⁰ Maharishi Patanjali, known as the “Father of Modern Yoga,” first described yoga philosophy and practice in the *Yoga Sutras*.^{34,35} In this classic text, he outlined an eightfold path to personal enlightenment, purpose, and a meaningful life called *ashtanga*.³⁵ The following four basic principles underlie the practice and teachings of yoga:

- (a) [The] human body is a holistic entity comprised of various interrelated dimensions inseparable from one another and the health or illness of one dimension affects the other

dimensions, (b) [individuals] and their needs are unique and therefore must be approached in a way that acknowledges this individuality and their practice must be tailored accordingly, (c) [yoga] is self-empowering; the student is his or her own healer . . . , and (d) [the] quality and state of an individuals mind is crucial to healing.³⁶

Therapeutic yoga is defined as “the application of yoga postures and practice to the treatment of health conditions and involves instruction in yogic practices and teachings to prevent, reduce, or alleviate structural, physiological, emotional, and spiritual pain, suffering, or limitations.”³⁶ Yoga is classified as a form of CAM by the National Institutes of Health; the practice of yoga integrates the physical, mental, and spiritual components of an individual in order to improve health and well-being.³⁶

The past decade of research has demonstrated a variety of therapeutic benefits associated with the practice of yoga in treating many illnesses, chronic diseases, and disabilities, such as chronic pain,³⁶ high blood pressure,³⁷ autism spectrum disorder,³⁸ trauma,³⁹ Alzheimer’s disease, epilepsy, fibromyalgia, peripheral nervous system disorders,¹⁰ fatigue and mood,^{40,41} chronic insomnia,⁴² depression,⁴³ heart attack and stroke,³⁶ and eating disorders,⁴⁴ as well as improved quality of life,⁴¹ neuromuscular function,⁴⁵ flexibility,⁴⁶ and better physical, emotional, and spiritual wellness among patients with cancer.⁴⁷ For example, Carson and colleagues⁴⁷ looked at the effects of a novel yoga intervention—the Yoga Awareness Program—among 13 women with metastatic breast cancer. The 8-week yoga intervention included the practice of gentle yoga asanas, breathing exercises, meditation, didactic presentations, and group interchange. The outcome was assessed by using daily measures of fatigue, distress, pain, relaxation, acceptance, and invigoration. Upon completion of the intervention, study participants reported significantly lower levels of pain and fatigue and higher levels of invigoration, acceptance, and relaxation. In combination, the preliminary findings of complementary or stand-alone yoga treatments represent a mere surface outline of the potential of yoga for health promotion, disease prevention, overall well-being, and quality of life.

Yoga and MS

Current empirical research has provided a large body of evidence illustrating the benefits and positive outcomes associated with the practice of yoga among individuals with MS, including reduced depression, decreased pain, reduced fatigue, increased lung capacity, improved bladder function, improved strength and flexibility, lower levels of stress, improved quality of life and muscle relaxation, and lower blood pressure.^{3,10,12,27,48–56}

By way of illustration, Doulati and colleagues⁴⁸ conducted a randomized controlled trial investigating the effects of three types of yoga on physical pain and quality of life among 60 women with MS. Poststudy analysis showed a significant improvement in physical pain management and quality of life in the case group, suggesting that yoga techniques can ameliorate physical pain and improve quality of life among individuals with MS.

In another study, Mishra et al.¹⁰ conducted a comprehensive literature review to investigate the therapeutic value of yoga in neurologic disorders, including MS. One study in

their review reported that 63% of patients use some form of alternative therapy, and almost half of these practice some form of yoga meditation. Another study reported a 17% improvement in selective attention using yoga as a complementary treatment. The overall findings from this literature review support the efficacy of yoga as a noninvasive option for treating many neurologic disorders and improving quality of life, and that improvement in neurological disorders may be attributed to the practice of yoga. Similarly, Franklin⁵⁰ conducted a qualitative study of the life experiences of individuals with MS who practice yoga and found a link between yoga and improved physical and emotional functioning, including stress reduction, increased social interaction, increased body awareness, increased motivation, and shifts in attitude and life focus.

An additional study by Patil et al.⁵² investigated the effect of integrated yoga on neurogenic bladder dysfunction as an adjunct to standard care among patients with MS. Their findings demonstrated significant improvement in postvoid residual urine scores on the Micturition Frequency Checklist, Incontinence Impact Questionnaire-7, and Urogenital Distress Inventory-6, suggesting that yoga may be a safe and effective treatment for bladder symptoms caused by neurogenic bladder dysfunction as an adjunct to standard care in patients with MS.

In a recent quantitative study, Guner and Inanici⁵⁵ investigated the use of yoga therapy for symptom management and quality of life improvement among patients with MS. Specifically, they evaluated the effects of a 12-week yoga intervention on fatigue, balance, and gait. Compared with baseline data, statistically significant improvements were found in both fatigue ($p=0.012$) and balance ($p=0.027$), as well as step length ($p=0.043$) and walking speed ($p=0.027$). This study further supports the use of yoga therapy as a safe and beneficial mind-body CAM intervention.⁵⁵

Conclusion

Overall, the findings from this paper suggest that yoga may be a safe and effective means of managing the symptoms of MS. More research needs to be conducted to determine the exact influence of yoga on symptoms that are specific to MS, including spasticity, depression, sensory disturbance, and impaired mobility. Moreover, a clear understanding of the various types of yoga and their specific uses will help facilitate a greater awareness and comprehension of the extent to which yoga may be used toward the successful symptom management of this disease. Finally, to draw more useful conclusions about the potential use and benefits of yoga in managing the symptoms of MS, future research should include more rigorously designed trials, with more diverse populations and more study participants.

Author Disclosure Statement

No competing financial interests exist.

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