

CASE SERIES

MULTIPLE SCLEROSIS AND YOGA

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Received 10 Dec 2019, Accepted 03 Febr 2020

<https://doi.org/10.31688/ABMU.2020.55.1.19>

ABSTRACT

Introduction. Multiple sclerosis is a chronic disease, characterized by episodes of focal deficits of the optic nerves, brain and spinal cord. The neurological manifestations are versatile, being determined by the variability of the localization and the extension of the demyelination points. However, the lesions have a predilection for certain parts of the central nervous system, resulting in complex signs and symptoms, such as weakness, paraparesis, paresthesia, loss of vision, diplopia, tremor, ataxia, profound sensitivity and bladder dysfunction. The primary symptom in some of the patients consists of weakness or paresthesia, occasionally both, detected at the position of one or more limbs. Usually, there are associated symptoms of limb insensibility and restriction sensations in the trunk and limbs. Multiple sclerosis is often accompanied by depression, anxiety, insomnia.

Cases presentation. A group of six patients aged between 16 years to 55 years, with multiple sclerosis, recurrent-remitting form, was divided into the control group and the yoga group. Each patient in both groups was evaluated neurologically, but also on the following scales: Hamilton Anxiety and Depression scales, Expanded Disability Status Scale, Modified Fatigue

RÉSUMÉ

Sclérose multiple et yoga

Introduction. La sclérose en plaques est une maladie chronique, caractérisée cliniquement par des épisodes de déficits focaux des nerfs optiques, du cerveau et de la moelle épinière. Les manifestations neurologiques sont polyvalentes, étant déterminées par la variabilité de la localisation et l'extension des points de démyélinisation. Cependant, les lésions ont une prédilection pour certaines parties du système nerveux central, entraînant des signes et symptômes complexes, tels que faiblesse, paraparésie, paresthésies, perte de vision, diplopie, tremblements, ataxie, sensibilité profonde et dysfonction de la vessie. Le symptôme principal chez environ une fraction des patients consiste en une faiblesse ou une paresthésie, parfois les deux, détectée à la position d'un ou de plusieurs membres. Sont généralement associés des symptômes d'insensibilité des membres et des sensations de restriction dans le tronc et les membres. La sclérose en plaques s'accompagne souvent d'affections telles que la dépression, l'anxiété, l'insomnie.

Présentation de cas. Un nombre de six patients âgés de seize à cinq ans présentant une forme rémittente et

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Impact Scale, The Bladder Control Scale and The Bowel Control Scale, Impact of Visual Impairment Scale, Mental Health Inventory and Perceived Deficits Questionnaire

Conclusions. Practicing yoga, meditation and outdoor contemplation with landscapes, for a period of six months have beneficial effects in patients with multiple sclerosis, with relapsing-remittent form. These activities improve the patients' quality of life and quality of cognition.

Keywords multiple sclerosis, yoga, anxiety, depression.

INTRODUCTION

Multiple sclerosis is the most prevalent chronic autoimmune inflammatory and demyelinating disease of the central nervous system¹. Multiple sclerosis affects the white matter of the central nervous system, by causing demyelination lesions of the axons that contribute to a decrease or blockage of conduction, which produces the symptoms of the disease². The following symptoms may occur: eye pain, especially during eye movements, blurred vision, which are part of optic neuritis, also superficial and deep tactile sensitivity changes in the limbs, most commonly in the lower limbs³. The symptoms that concern both the physical and the mental side are: fatigue, asthenia, mood swings, depression and anxiety^{4,5}.

CASES PRESENTATION

We aimed at investigating the possible effects of yoga practice in patients with multiple sclerosis. Recent data from the literature sustain that the physical, as well as the mental symptoms of the patients with multiple sclerosis can be influenced by yoga practice which provides a better mental state, that could also improve the physical symptoms.

This case series aimed to analyze the performance of patients with multiple sclerosis who practiced yoga for six months, from June to December 2018. The patients were evaluated and monitored in the private clinic "Dr. Docu Axelerad Any", Constanta, Romania. The participants were patients

récurrente de sclérose en plaques ont été divisés en groupe témoin et groupe yoga. Chaque patient dans les deux groupes a été évalué neurologiquement, mais également sur les échelles suivantes : Échelles de l'anxiété et de la dépression de Hamilton, Échelle élargie du statut d'invalidité, Échelle d'impact de la fatigue modifiée, Échelle de contrôle de la vessie et échelle de contrôle de l'intestin, Impact sur l'échelle de la déficience visuelle, Inventaire de la santé mentale et Questionnaire sur les déficits perçus.

Conclusions. Les résultats de cette série de cas sont que la pratique du yoga, de la méditation et de la contemplation en plein air avec des paysages, pendant une période de six mois, a des résultats bénéfiques pour les patients atteints de sclérose en plaques, avec une forme rémittente-récurrente et que ces activités ont une réponse dans l'amélioration de la qualité de vie des patients et la qualité de la cognition.

Mots-clés: sclérose en plaques, yoga, anxiété, dépression.

with multiple sclerosis, with the recurrent-remissive form. The patients were individually diagnosed by the same physician and they met the standard criteria to be included in the relapsing-remittent form of multiple sclerosis.

The inclusion criteria in the study were: diagnosis of relapsing-remittent form of multiple sclerosis, age between 16-55 years, ability to sign the informed consent.

The criteria for exclusion of the patients from the study were the following: age below 16 years or over 55 years, diagnosis of primary and secondary progressive forms of multiple sclerosis, inability of the patients to sign the informed consent.

The analysis aimed at investigating the patients both from the physical and the mental points of view. A group of six patients with relapsing-remittent multiple sclerosis was divided in two subgroups, one control group and one group practicing yoga for six months.

Six patients met the criteria for inclusion in the study; they all signed an informed consent and were divided aleatory in two groups: the yoga practicing group and the control group patients, who did not practice yoga and continued the activities as before.

Patients from the yoga group were trained by specialized therapists in the same clinic, they practiced different movements and stretches of yoga, complementing with recommendations of outdoor meditation, in a natural environment, with landscapes, parks or the beach, dependent on the needs and possibilities of the patients. After the first week of

yoga practice in the clinic, each patient was trained to practice the exercises and moves at home, helped also by a CD with the corresponding yoga techniques.

In each patient, the Expanded Disability Status Scale⁶, a tool that quantifies disability in multiple sclerosis, was calculated at initiation of the study and every month over 6 months. In addition, the Hamilton Anxiety⁷ and Depression⁸ scales were performed during the six months. Also, for each patient in both groups, the Modified Fatigue Impact Scale⁹ was calculated, before, during and after the six months. In addition, we performed a test before, during and after the six months, regarding the quantifying of the unpleasant sensations¹⁰ and feelings¹¹ that multiple sclerosis patients most often have. Regarding the sphincter activity¹² that is often altered in patients with multiple sclerosis we performed the following tests: the Bladder Control Scale and the Bowel Control Scale during the period of six months. Regarding the visual impairments¹³, we performed the Impact of Visual Impairment Scale in the form of questionnaires during the six months. Perceived Deficits Questionnaire that followed the subjective answers was performed every month during the six months period. Also, the Mental Health Inventory was performed, with the purpose of finding out how the patients felt¹⁴⁻¹⁶.

The first patient from the yoga group, A.S., 33 years old, female, had two typical attacks for multiple sclerosis in the central nervous system, with objective evidence for both lesions at the clinical examination and was diagnosed five years before. At the beginning of the six months, the patient had paresthesia to touch and decreased pin sensation on the right side and mild vibratory sense loss in the distal lower extremities. Also, the patient presented altered vision and urinary bladder symptoms. She had difficulties in thinking clearly. The results obtained by

the patient before and after practicing yoga for six months are revealed in Table 1.

The second patient from the yoga group, B.I., 36 years old, male, with recurrent-remittent multiple sclerosis in the central nervous system, with objective evidence at the clinical examination for both lesions and was diagnosed seven years before. At the beginning of the six months, the patient had stumbling gait, tendency to fall, a decreased rate of rapid alternating movements and dysdiadochokinesia. Also, the patient presented vision problems and bowel problems. The results obtained by the patient before and after practicing yoga for six months are revealed in Table 1.

The third patient from the yoga group, C.D., 38 years old, female, had four typical attacks for multiple sclerosis in the central nervous system, with objective evidence at the clinical examination for three lesions and was diagnosed seven years before. At the beginning of the six months, the patient presented paresthesia on the left limbs, a decreased pin sensation, moderate vibratory sense loss, tremor on the upper limbs, dysdiadochokinesia and heat intolerance. The bladder and bowel problems were present. She had difficulties of thinking clearly and of maintaining a mental balance. The results obtained by the patient before and after practicing yoga for six months are shown in Table 1.

The first patient from the control group, N.V., 31 years old, female, had two typical attacks for multiple sclerosis in the central nervous system with objective evidence at the clinical examination for both lesions and was diagnosed four years before. At the beginning of the six months, the patient had paresthesia on touch and decreased pin sensation on the left side and mild vibratory sense loss in the distal lower extremities. Also, the patient presented moderate vision problems and mild bladder problems. She had

Table 1. The test results of the yoga patients before and after practicing yoga for six months

	Patient 1 of the Yoga Group		Patient 2 of the Yoga Group		Patient 3 of the Yoga Group	
	Before yoga	After yoga	Before yoga	After yoga	Before yoga	After yoga
Expanded Disability Status Scale	3	3	3	3	4	4
Hamilton Anxiety Scale	30	25	20	15	36	30
Hamilton Depression Scale	16	12	13	9	14	11
Modified Fatigue Impact Scale	14	8	18	12	20	16
The Bladder Control Scale	5	3	2	2	4	4
The Bowel Control Scale	3	2	6	4	5	4
Impact of Visual Impairment Scale	5	4	6	5	7	7
Perceived Deficits Questionnaire	32	25	36	30	42	36
Mental Health Inventory	75	64	60	64	60	54
MOS Modified Social Support Survey	72	72	65	75	68	78

difficulties in thinking clearly. The results obtained by the patient before and after the six months are revealed in Table 2.

The second patient from the control group, S.T., 29 years old, female, had two typical attacks of multiple sclerosis in the central nervous system with objective evidence at the imaging and clinical examination for both lesions and was diagnosed three years before. At the beginning of the six months, the patient had stiff muscles and trouble moving her body, problems with coordination and balance, and dizziness. Also, the patient presented vision problems: eye pain and double vision. The patient's bladder problems were mild. The results obtained by the patient before and after the six months are revealed in Table 2.

The third patient from the control group, V.A., 35 years old, male, had three typical attacks for multiple sclerosis in the central nervous system with objective evidence at the clinical examination for the three lesions and was diagnosed two years before. At the beginning of the six months, the patient had significant changes in neurologic functions, stumbling gait, tendency to fall, rapid alternating movements decreased, dysdiadochokinesia, mild paraparesis, without severe spasticity and paresthesia in the right territory. Also, the patient presented mild vision problems. The patient's bladder problems were mild. The results obtained by the patient before and after the six months are revealed in Table 2.

DISCUSSION

Several studies have shown positive effects of yoga exercises in different diseases, such as diabetes, asthma and hypertension¹⁷⁻¹⁹. These results motivated us to study the possible outcome in people with multiple sclerosis with recurrent-remittent form.

The aim of our study was to investigate the possible effects of yoga related to the following functions: cognitive function, mood, fatigue and depression in patients with multiple sclerosis, recurrent-remittent form, with important roles of patients' quality of life. Studies in the literature showed that mild aerobic exercises have a positive impact on the psychological state of the patients²⁰⁻²⁴. The state of mind of the patients was investigated by the Hamilton Anxiety and Depression Scale and the group of yoga patients showed improvements in the mood, energy levels and their interest for socializing with other persons. Also, studies that investigated the effects of yoga on the mental state of the patients with different diseases showed major improvements, the majority of patients practicing yoga having changed their perception on the disease, helping them to cope with their diseases and also the results of these patients' tests have become favorable after practicing yoga²⁵⁻²⁸.

Studies in the area of the balance in connection to yoga exercises have shown no improvements in the balance and mobility²⁹. Our study did not show any improvements in this area, too.

CONCLUSIONS

Practicing yoga, meditation and outdoor contemplation with landscapes, in the park or on the beach for six months has beneficial results for patients with multiple sclerosis, with relapsing-remittent form, improving their quality of life, quality of cognition, managing the psychic, decisions and emotions and even may improve the physical form. On the other hand, improvements were observed in the following conditions that often accompany depression, anxiety and insomnia. Mild beneficial changes were observed in the functioning of the gastrointestinal and urinary

Table 2. The results obtained by the control group patients before and after the six months.

	Patient 1 of the Control Group		Patient 2 of the Control Group		Patient 3 of the Control Group	
	Before the 6 months	After the 6 months	Before the 6 months	After the 6 months	Before the 6 months	After the 6 months
Expanded Disability Status Scale	3	3	2	2	3	3
Hamilton Anxiety Scale	37	39	25	27	30	32
Hamilton Depression Scale	13	14	20	23	16	17
Modified Fatigue Impact Scale	18	21	25	30	20	22
The Bladder Control Scale	3	3	2	2	4	4
The Bowel Control Scale	2	2	3	3	3	3
Impact of Visual Impairment Scale	7	7	6	6	4	4
Perceived Deficits Questionnaire	35	38	30	34	30	31
Mental Health Inventory	85	87	70	73	70	71
MOS Modified Social Support Survey	66	66	73	73	60	60

systems. It was also noted that these methods helped patients and caregivers to strengthen their relationship. These results should be considered as preliminary ones, their extension being considered in the future on a larger group of patients.

Author contributions

D.A.A. was responsible for the diagnostic procedures, clinical diagnosis, and treatment decisions. S.A.Z. and D.A.S. performed the interviews with the patients. S.A.Z., D.A.S. and D.A.D. wrote the manuscript. All authors have read and agreed to the published version of the manuscript.

Compliance with Ethics Requirements:

„The authors declare no conflict of interest regarding this article“

„The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Informed consent was obtained from all the patients included in the study“

„No funding for this study“

Acknowledgments: none

REFERENCES

- McFarlin DE, MacFarland HF. Multiple sclerosis. *N Engl J Med.* 1982;30:1183-1186.
- Moreau T, Coles A, Wing M, et al. Increase in symptoms associated with cytokine release in patients with multiple sclerosis. *Brain.* 1996;1:225-237.
- Kister I, Bacon T E, Chamot E, et al. Natural history of multiple sclerosis symptoms. *International Journal of MS.* 2013(3):146-156.
- Sirbu CA, Furdu-Lungut E, Plesa CF, Nicolae AC, Dragoi CM. Pharmacological treatment of relapsing remitting multiple sclerosis-where are we? *Farmacologia.* 2016;64(5):651-655.
- Sirbu CA, Dragoi CM, Nicolae AC, Plesa CF. History of interferon treatments in multiple sclerosis – 60 years of progress. *Farmacologia.* 2017;65(1):14-18.
- Kurtzke JF. Rating neurologic impairment in multiple sclerosis: an expanded disability status scale (EDSS). *Neurology.* 1983;33(11):1444-52.
- Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol.* 1959;32:50-55.
- Hamilton M. A rating scale for depressive disorders *Psychological Reports.* 1964;14:914-915.
- Fisk JD, Ritvo PG, Ross L, et al. Measuring the functional impact of fatigue: initial validation of the fatigue impact scale *Clin Infect Dis.* 1994;18(1):79-83.
- Alter M, Yamoore M, Harshe M. Multiple sclerosis and nutrition *Arch Neurol.* 1974; 31(4):267-272.
- Bruck W, Schmied M, Suchanek G, et al. Oligodendrocytes in the early course of multiple sclerosis. *Ann Neurol.* 1994;35:65-73.
- Allen IV. Pathology of multiple sclerosis. *Matthews WB.* 1991;78:341-342.
- Hofman FM, Hinton DR, Johnson K, et al. Tumor necrosis factors identified in multiple sclerosis brain. *J Exp Med.* 1989;170(12):607-608.
- Raine CS, Scheinberg L, Waltz JM. Multiple sclerosis: oligodendroglia survival and proliferation in an active established lesion. *Lab Invest.* 1981;45:534-536.
- Omerod I, Miller D, McDonald W, et al. The role of NMR imaging in the assessment of MS and isolated neurological lesions. *Brain.* 1987;110:1579-1616.
- Fazekas F. Magnetic resonance signal abnormalities in asymptomatic individuals: their incidence and functional correlates. *Eur Neurol.* 1989;29:164-168.
- Sahay B K. Yoga and diabetes. *J Assoc Physicians India.* 1986;34:645-648.
- Nagendra R, Nagaranta R. An integrated approach of yoga therapy for bronchial asthma: A 3-54 months prospective study. *J Asthma.* 1986;23:123-137.
- Selvamurthy W, Sridhran K, Ray US, Tiwari RS, Hegde KS, Radhakrishnan U. A new physiological approach to control essential hypertension. *Indian J Physiol Pharmacol.* 1998; 42: 205-213.
- Fazekas F, Offenbacher H, Fuchs S, et al. Criteria for an increased specificity of MRI interpretation in elderly subjects with suspected multiple sclerosis. *Neurology.* 1988;38:1822-1825.
- McCullagh R, Fitzgerald AP, Murphy RP. Long-term benefits of exercising on quality of life and fatigue in multiple sclerosis patients with mild disability: a pilot study. *Clin Rehabil.* 2008; 22 (3): 206-214.
- Stroud NM, Minahan CL. The impact of regular physical activity on fatigue, depression and quality of life in persons with multiple sclerosis. *Health Qual Life Outcomes.* 2009;7: 68.
- Scully D, Kremer J, Meade MM. Physical exercise and psychological well being, a critical review. *Br J Sports Med.* 1998;32:111-120.
- Daley A. Exercise and depression: a review of reviews. *J Clin Psychol Med Settings.* 2008;15(2):140-147.
- Oken BS, Kishiyama S, Zajdel D. Randomized controlled trial of yoga and exercise in multiple sclerosis *Neurology.* 2004;62(11):2058-2064.
- Oken BS, Zajdel D, Kishiyama S. Randomized, controlled, six-month trial of yoga in healthy seniors: effects on cognition and quality of life. *Altern Ther Health Med* 2006;12(1):40-47.
- Elavsky S, McAuley E. Physical activity and mental health outcomes during menopause: a randomized controlled trial. *Ann Behav Med.* 2007;33(2):132-142.
- Bosch PR, Traustadóttir T, Howard P. Functional and physiological effects of yoga in women with rheumatoid arthritis: a pilot study. *Altern Ther Health Med.* 2009;15(4):24-31.
- Ahmadi A, Nikbakh M, Arastoo A, Habibi AH. The effects of a yoga intervention on balance, speed and endurance of walking, fatigue and quality of life in people with multiple sclerosis *J Hum Kinet.* 2010;23:71-78.