



Synopsis

Medical synopsis: Yoga may assist females with multiple sclerosis by influencing cortisol and adrenocorticotrophic hormone (ACTH) levels

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The synopsis is based on the following journal article:

Najafi P, Moghadasi M. The effect of yoga training on enhancement of Adrenocorticotrophic hormone (ACTH) and cortisol levels in female patients with multiple sclerosis. *Complementary Therapies in Clinical Practice*. 2017, 26: 21–25.

Design	A quasi-experimental design with pre-test and post-test measurements used. Participants were randomly assigned to the exercise group ($n = 14$) or the control group ($n = 10$).
Participants	Twenty-four females aged 29–50 years of age. Volunteers from the Multiple Sclerosis (MS) Centre of Shiraz, Iran. All participants must have been diagnosed with MS by a neurologist. They had to have no cardiovascular, orthopaedic, pulmonary disease, pregnancy, cancer, bone fractures of less than 6 months, any serious nervous system disorders or other health problems that restrict their physical ability other than MS. Other inclusion criteria included no relapses which required the use of corticosteroid drugs or cortisone injections within the last three months prior to the study. All participants were within the Expanded Disability Status Scale (EDSS).
Intervention	Yoga training 3 days per week for 8 weeks. Yoga classes were conducted by trained yoga teachers. Classes were held in quiet rooms and consisted of a standardised set of Iyengar yoga postures and stretches. Total exercise session was 90 min: 15 min warm-up, followed by 30 min of active yoga, 15 min inactive cool down, 10–20 min relaxation, e.g. breathing exercises.
Comparator	Participants were asked to not participate in any other physical activity during the time of the study.
Major outcomes	No changes in anthropometric and body composition. Significant changes were noted for cortisol and ACTH ($p < 0.05$). ACTH increased in the exercise group compared to control ($p < 0.05$) and cortisol was reduced significantly ($p < 0.001$).

Settings The study was conducted through the Department of Exercise Physiology, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran.

Conclusion Yoga assists in decreasing cortisol and increasing ACTH in females diagnosed with MS. Yoga therapy maybe be beneficial for MS patients in reducing cortisol levels and increasing ACTH.

1. Commentary

Multiple sclerosis (MS) is an autoimmune disease that affects over 2.3 million individuals worldwide [1]. The pathogenesis of MS is primarily driven by autoreactive immune cells attacking the myelin sheath and axons of the central nervous system (CNS) leading to demyelination within the spinal cord and brain [2]. In addition to the demyelination, other bodily functions can be affected including hypothalamic dysfunction, which has been found in chronic inflammatory diseases similar to MS [3,4].

The dysfunction in the hypothalamic region found in MS patients mainly affects three main areas. These include general hypothalamic-pituitary-adrenal axis hyperactivity, disordered orexin neurotransmission, and abnormal cortisol secretion. The abnormal cortisol secretion has been suggested to be the cause of low cortisol in MS patients [5] and result in fatigue.

ACTH has been found to help regulate processes relevant to MS, including anti-inflammatory and immunomodulatory functions involving lymphocytes, macrophages, the sympathetic nervous system that participates in the inflammatory process and reduction of pro-inflammatory cytokines [7]. Studies have found that increasing the cortisol levels in MS patients is associated with suppression of disease activity [6] and treatments such as ACTH gels has been used for treatment [7]. In particular, ACTH gels have been found to be effective in relapsing MS patients and has had positive clinical outcomes with few adverse events [7].

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Identifying preventative treatments or activities that can suppress the disease progression in MS patients is a key clinical goal. Yoga is an activity which is easy to incorporate into daily life, low cost, low impact and non-invasive. These findings indicate that it would be highly beneficial for ladies and potentially men with MS to incorporate yoga therapy to assist in suppressing their disease progression through alterations in the cortisol and ACTH levels. While further research in this area is still needed, this study suggests yoga practice by MS patients may be beneficial.

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