

Is It Safe for Multiple Sclerosis Patients to Fast?

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ABSTRACT

Ramadan fasting might predispose multiple sclerosis (MS) patients to major risks. Therefore, clinicians should have practical knowledge about the effects of fasting on MS. A mini-symposium was held in 2013 to answer the common questions about fasting among MS patients. In the current review, we present a summary of this mini-symposium. Generally, the majority of stable MS patients can adhere to this religious practice. Monitoring of the symptoms, proper adjustment of drug regimens and informing patients about MS and fasting are inevitable parts of patient management. Based on the data reported in experimental studies, calorie restriction prior to disease induction can ameliorate disease severity by reducing inflammation and demyelination. According to the results of this mini-symposium, fasting has no adverse effects on the course of the disease in patients with mild disabilities, indicated by Expanded Disability Status Scale (EDSS) score ≤ 3 . A general consensus was reached on the exacerbation of some MS symptoms such as dizziness, fatigue, sensory deficit, cognitive problems, spasticity, vision impairment, weakness, abnormal gait and imbalance during fasting, especially during summer, although these symptoms subside during feasting. The majority of experts did not recommend fasting to patients receiving high doses of anti-spastics, corticosteroids and anticonvulsants or those with active MS, coagulopathy or EDSS score ≥ 7 during MS attacks.

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Introduction

Several religions have recommended different periods of fasting. Based on a demographic survey in 2009, Muslims account for 23% of the world's population (1.57 billion individuals) (1). This number is growing by approximately 3% each year. Fasting during the month of Ramadan is one of the five pillars of Islam. During Ramadan, drinking, eating, smoking and sexual intercourse are not allowed for adult Muslims from sunrise to sunset.

Menstruating, pregnant and lactating women, travelers and individuals with medical conditions and disabilities are exempt from fasting (2). However, many Muslims, who are exempt from this religious practice, including those with mild, moderate and severe medical disorders, choose to fast during this month. Recent studies have revealed no contraindication to Ramadan fasting in patients with stable asthma, asymptomatic peptic ulcers, intestinal motility disorders, mild coronary artery disease or valvular problems.

Accordingly, Muslim patients with various medical conditions seek advice on the safety of fasting (3).

Multiple sclerosis (MS) is an immune-mediated, often progressive, demyelinating disease with an unclear etiology, which has affected about 2.5 million people, worldwide. This condition is identified as the most common debilitating neurological disorder in young adults (4). Therefore, a group of neurologists, nutritionists and pharmacists gathered together in 2013 to assess the clinical implications of Ramadan fasting in MS patients. The current article is a summary of this mini-symposium (5).

Fasting in animal studies

Calorie restriction (CR) with nutritional adequacy has been reported to extend the lifespan of different animal species (6). Moreover, CR is suggested to delay the onset of cardiomyopathy, atherosclerosis, type II

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diabetes, renal diseases, respiratory disorders and different types of cancer (6).

Several molecular and cellular mechanisms contribute to the effectiveness of CR in MS and experimental autoimmune encephalomyelitis (EAE), which is an animal model for MS. CR might ameliorate age-related increments in phospho-IkB, tumor necrosis factor- α and nuclear factor kappaB (7), improve the antioxidant defense (8), reduce the mitochondrial production of free radicals (9), promote the activity of neurotrophic factors (10), enhance neurogenesis (6), induce anti-inflammatory characteristics (6) and reduce leptin level and oligodendrocyte apoptosis (11).

Few studies have assessed the effect of CR on EAE. Based on a study by Esquifino et al., CR started to reduce disease severity in rats by 33-66% from day 15 prior to EAE induction (7, 12). Based on the findings, 66% CR in rats led to impaired proliferation of lymphocytes, reduction in the number of CD4+ cells in lymphoid organs and dampened production of interferon gamma. In a study by Piccio et al., 40% CR in mice five weeks prior to EAE induction had positive effects on the course of the disease. In fact, CR worked through inducing the production of endogenous glucocorticoids (13).

Fasting in human studies

Despite the scarcity of data on Islamic fasting and MS, the antioxidative and immunomodulatory properties of fasting have been recently assessed. Ahmed T et al. assessed 10% and 30% CR in 40 healthy, overweight men and women for six weeks. Delayed-type hypersensitivity responses, which reflect cell-mediated immunity, were significantly induced in both groups. Furthermore, 30% CR decreased T-cell proliferative responses to anti-CD3 (14). Moreover, as Latifynia et al. indicated, Ramadan fasting could improve innate immune responses (15). Epidemiologic studies also reported the beneficial effects of calorie restriction in reducing MS risk (16-18).

So far, only two studies have been conducted on Ramadan fasting in MS patients, which reported no significant differences in EDSS score, relapse rate and gadolinium-enhanced lesions on MRI of fasting and non-fasting MS patients (with EDSS score < 3) in six-month and one-year follow-ups (19, 20).

Summary of the mini-symposium

Safety of fasting for MS patients

Islamic fasting is considered to be risk-free for the majority of MS patients. However, a general recommendation cannot be proposed, and the individual's condition should be taken into account. According to previous studies, Ramadan fasting does not seem to have any unfavorable short-term effects on MS patients with mild disabilities (19, 20). Patients should be under precise care for individual symptoms (e.g., fatigue and energy level), MS type, extent of disability, use of medications and systemic disorders. Moreover, patients should be educated on the symptoms related to MS exacerbation.

Effects of fasting on MS symptoms

Based on previous studies, fasting has no adverse short-term effects on the course of MS (19, 20). However, some MS symptoms, including dizziness, fatigue, spasticity, weakness, cognitive problems, impaired vision, abnormal gait and imbalance might exacerbate during fasting, although the patient's status is normalized during feasting.

Previous research has reported fasting-induced fatigue and perceived fatigue in healthy adults (21). According to the available data, fasting has no unfavorable effects on the vision of healthy adults (22). However, experts believe that fasting could affect vision in MS patients, unlike healthy adults. In a previous study, Ramadan fasting had adverse impacts on postural control of judo athletes (23). In another study on healthy athletes, comparison of cognitive function in the morning and afternoon showed a significant decline in verbal and visual learning, memory and psychomotor functions (24).

Fasting and MS exacerbation

According to the available data, Ramadan fasting neither provokes nor inhibits MS attacks.

Fasting and symptomatic treatments

In some cases, adjusting the drug regimen is possible during Ramadan by prescribing long-acting or slow-release drugs during feast time or substituting oral agents with injections; however, timing alteration between doses could affect drug efficacy and tolerability (3).

Furthermore, food-drug interactions can lead to delayed, increased or reduced bioavailability of the drug.

Among commonly prescribed medications in MS patients, food-drug interactions have been reported in pregabalin, tizanidine, gabapentin, carbamazepine and selective serotonin reuptake inhibitors (25-30). Most experts believe that patients on high doses of antiepileptic and anti-spastic drugs or those using medications more than twice a day are not eligible for fasting.

Fasting and disease-modifying drugs

The pharmacodynamics and pharmacokinetics of glatiramer acetate and interferons are not affected by fasting or food consumption (31, 32). There are no available data on the effect of fasting on fingolimod. Prolonged fasting could affect the pharmacodynamics and pharmacokinetics of immunosuppressive agents. Also, drug-food interactions may result in delayed, reduced or increased systemic availability of these agents. Moreover, limited access to fluids during fasting might negatively affect cyclophosphamide levels (33).

Fasting and the level of disability

Fasting is reported to be risk-free for patients with EDSS scores ≤ 3 (19, 20). Patients with higher EDSS scores are less active and are consequently at a higher risk of upper urinary tract infections, constipation, diverticulitis and bedsores; in fact, dehydration might aggravate these symptoms. Consequently, fasting is not recommended to patients with EDSS scores ≥ 7 .

Fasting and MS type

Regardless of MS type, patients with highly active MS should avoid fasting. Additionally, patients, who have experienced MS attacks during or after Ramadan fasting, should refrain from this practice.

The safety of month-long fasting in hot climates for MS patients

Fasting during summer might exacerbate the unfavorable effects of fasting. Individualized monitoring of MS patients, who are willing to fast, is highly recommended. According to Saadatnia et al., fasting for 13 h/day for 28 days did not induce any unfavorable short-term effects (19). Therefore, the interval between

fasting days must be arranged, considering the patient's condition. Moreover, appropriate food and liquid intake during feasting and adequate sleep are recommended.

Conclusion

In the reviewed mini-symposium, a general consensus was reached on the safety of Ramadan fasting for many MS patients. Individualized monitoring of diet, drug regimens and sleep patterns would help reduce the potential unfavorable effects of fasting. However, fasting is not recommended during MS attacks for patients on high doses of anticonvulsants or anti-spastic drugs and those with active MS, EDSS score ≥ 7 or coagulopathy.

Conflicts of interest

The authors declare no personal or financial conflicts of interest.

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