# The Impact of Fasting on Rheumatic Diseases

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**KEY WORDS:** diet, fasting, Ramadan, Eid Al-Fitr, religion and health, rheumatic diseases

*IMAJ* 2017; 19: 378–379

In the current issue of *IMAJ*, Habib and Rashid [1] report on serum uric acid and arthritis among patients with gout.

Religion and spirituality are often overlooked by physicians [2] who prefer to rely on a reductionist, mechanistic, non-holistic and non-ritualistic approach even though there is mounting scholarly evidence that faith and religiosity have a profound impact on health, both physical and mental [3]. Ellison and Levin [4] term this approach the "religion–health connection hypothesis". Religious commitment and involvement are a multi-faceted and multi-dimensional construct, resulting in the adoption of complex bio-behavioral and psycho-social practices and customs, which affect health status and well-being [5]. Attending ceremonies and rituals fosters cooperation and in-group mutual help, promoting social integration, social support, connection with others, and social personal regulation. Religion, as such, acts as a "pro-social agent". Furthermore, religion would favor self-esteem, self-worth, self-actualization, motivation, sense of coherence and personal competence, and efficacy as well as offer coping resources for emotional comfort and regulation of stress, depression, fear, and anxiety. These are some of the hypothesized and investigated mechanisms that seem to link together religion (and/or spirituality) and health, that is, beliefs and personal lifestyles/behaviors [4,5].

Islam is one of the three Abrahamic faiths, together with Judaism and Christianity. It represents the second largest religious group worldwide, accounting for a quarter of the entire global population. According to the latest available demographic data (2017), Muslims constitute approximately 18% of the general population in Israel. Fasting during the Ramadan, the ninth month of Islamic calendar, is one of the five pillars of the Islam creed, requiring abstinence from eating, drinking, smoking, and sexual intercourses from sunrise to sunset. Since the Islamic calendar is lunar, the fasting period varies from 10–11 hours in the winter to 18–20 hours in the summer, with an average of 15 hours, depending on the latitude of the geographical location and on the timing of Ramadan during the seasonal cycle. During Ramadan, Muslims consume two main meals, one shortly before dawn (*Suhoor*) and the other immediately after sunset (*Iftar*). Ramadan is one of the various types of fasting, which may include periodic fasting for weight loss, caloric restriction, dietary restriction or manipulation; however, it represents a particular form of fasting, which consists of alternate abstinence and feasting (re-feeding) periods [6].

Although children, pregnant and breast-feeding women, travelers and old and frail people are exempt from observing this religious duty, they may be eager to share this particular moment of the year with their family and peers. However, there are very few guidelines, consensus statements or standardized protocols that can help physicians properly address the issue of patients willing to fast during the month of Ramadan, and to correctly advise them [6-10]. Moreover, in a more interconnected and globalized society, in which more and more Muslims live in Western countries, this topic is not only a mere academic curiosity, but is of high interest for all healthcare practitioners.

Hippocrates said, "Let food be thy medicine and medicine be thy food," which emphasizes the important role of healthy nutrition, both in the etiopathogenesis and in the prevention of diseases. Studying the health impact of religious fasting, such as the fasts of Seventh-Day Adventists, Zen Buddhists (*Danjiki*), or Jews (*Yom Kippur*), among others, could help us better understand the physiological and physiopathological mechanisms of fasting at a biochemical and cellular/molecular level.

In this regard, the month of Ramadan represents a unique opportunity in which to observe and investigate the impact of fasting on human health [6]. Eid Al-Fitr (EAF) is a 3 day Islamic holiday marking the end of Ramadan. EAF is usually celebrated by consuming protein-rich meals.

The impact of fasting on rheumatic diseases, and especially on gout, has rarely been investigated. Habib and Rashid [1] assessed the homeostasis of serum uric acid and the incidence of gouty attacks. In their study, no patient had a gouty arthritic attack during the study period.

Previous studies had found some evidence of dehydration during Ramadan fasting, with an increase in serum urea, creatinine and uric acid levels [11,12], whereas other studies could not detect any statistically significant changes in serum uric acid levels [13,14]. The results of the study by Habib and Rashid [1] could be because more than two-thirds of the patients adhered to allopurinol treatment during Ramadan and EAF, and an even higher percentage was compliant with col-

chicine treatment. Adherence to treatment is a crucial issue in successful patient care of those with gout. Aadil et al. [15] found that patients who are not compliant with the pharmacological treatment may arbitrarily change the intake time and dosage of drugs without consulting medical experts.

To the best of our knowledge, only one other study has investigated the impact of Ramadan on rheumatic patients. Goharifar and colleagues [16] could not detect any change in systemic lupus erythematosus (SLE) disease activity index and health quality of life. Furthermore, no effect on lipid profile could be found, apart from a delayed total cholesterol decrease (16.4 ± 29.4 mg/dl decrease in subjects vs. 4.6 ± 23.9 mg/dl decrease in controls, $P = 0.018$).

However, while addressing an often overlooked topic, the study by Habib and Rashid [1], considering its sample size and its study design, represents a pilot investigation that warrants further research in the field, especially high-quality randomized controlled clinical trials. These studies should particularly focus on the clinical safety of fasting (in terms of adverse events), on the pharmacodynamics and pharmacokinetics of drugs, and on their possible adjustments during the fasting.

Moreover, patients with gout and other rheumatic diseases should receive proper health education and be actively engaged and involved in every step of the healthcare delivery process.

## CONCLUSION

The impact of fasting on patients with rheumatic diseases can also have practical, translational implications given the recent interest for dietary interventions for rheumatic diseases [17-21]. An excessive intake of alcohol and beverages such as soft drinks or fruit juices, as well as consumption of red meat increases the risk of developing gout, whereas low-fat dairy products, purine-rich vegetables, whole grains, nuts and legumes, fruits, coffee and vitamin C supplements seem to reduce the risk of hyperuricaemia and gout, as they promote the excretion of uric acid [19,20]. The ATTICA population-based health and nutrition survey has demonstrated that adherence to Mediterranean diet exerts a protective effect against hyperuricaemia with an odds ratio of 0.30 [21].

However, further investigations are urgently needed, for example, to determine the effects of different diets and types of fasting on patients suffering from rheumatic diseases.

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**"The love of one's country is a splendid thing. But why should love stop at the border"**

Pablo Casals (1876-1973), Spanish cellist, conductor and composer

**"I should dearly love that the world should be ever so little better for my presence. Even on this small stage we have our two sides, and something might be done by throwing all one's weight on the scale of breadth, tolerance, charity, temperance, peace, and kindliness to man and beast. We can't all strike very big blows, and even the little ones count for something"**

Sir Arthur Ignatius Conan Doyle (1859–1930), physician and writer, best known for his detective fiction featuring the character Sherlock Holmes