

Effect of Ramadan Fast on Liver Function Tests

Dear Editor,

The Ramadan fast as a religious duty is practiced by millions of healthy adults. This type of intermittent fasting has different physiological effects on the body. Given the immense number of Muslims fasting every year, this study was designed to assess the effect of the Ramadan fast on liver function tests.

Liver function tests have scarcely been mentioned by studies and the results have been diverse. Some studies have demonstrated no change in aspartate transaminase (AST) and alanine transaminase (ALT), but a rise in bilirubin levels.¹ Conversely, others have reported a decrease in AST and ALT and no change in bilirubin levels.² Therefore, the present study aimed to assess liver function tests during the Ramadan fast to provide physicians with a broader view on the impact of the Ramadan fast on the liver.

The target population was seminary students in the Iranian city of Shahrekord. This research was carried out in the month of Ramadan in 2006 (from September to November). Healthy adults within the age range of 15 to 50 years with no history of liver diseases and no current use of any medication affecting the liver were included in the current study. The exclusion criteria consisted of any history of hepatic disease, lack of involvement in any session of blood sampling, and use of medications with hepatic side effects. Fifty-seven adult healthy participants, 35 males and 22 females, at an age range of 15–24 years were included in the study.

Fasting serum levels of liver function tests, including ALT, AST, alkaline phosphatase (ALP), albumin, and total and direct bilirubin, were measured 4 times: before, during (the second and last weeks), and a month after the holy month of Ramadan. The data were analyzed using a repeated measured ANOVA model, and comparison between stages was performed using the paired *t*-test by SPSS software version 16.

Mean AST increased gradually in the second and fourth stages ($P=0.032$ and $P=0.001$, respectively) compared to baseline levels, and total serum bilirubin also increased ($P=0.059$), except for the second week ($P=0.07$). Mean ALT decreased significantly ($P<0.05$) only in the second week. ALP assessment showed no significant change during the whole study ($P=0.342$). Serum albumin only increased significantly 1 month after Ramadan ($P<0.05$).

Elfert et al.³ compared liver function test serum values before and after Ramadan in 216 cirrhotic patients and reported a rise in serum bilirubin 1 month after Ramadan. Likewise in our study, serum bilirubin rose compared to pre-Ramadan values. The authors also reported a decrease in ALT, AST, and ALP. We also observed a decrease in ALT and ALP, but an increase in AST, compared to pre-Ramadan values. Although they studied cirrhotic patients, their results were similar to those in the present study.

The current study was also limited in some aspects, first and foremost among which is that there was no available tool to verify that the participants were really fasting. Thus, we selected our samples from seminary students, who keep their fast due to their religious beliefs. Moreover, it would have been desirable if we had selected a control group to strengthen the results; however, since the study was conducted in an Islamic country, it was impossible to ask people not to fast. Moreover, those who were not fasting had a serious disease or were pregnant or chose to tell a lie about fasting because of the dim view the society at large holds those not adhering to religious obligations. The fact that we took blood samples at 4 time points also caused a significant dropout of participants.

We conclude that although Islamic fasting has a statistically significant effect on ALT, AST, ALP, and bilirubin levels, these changes were within the normal range and clinically insignificant. Mild changes in liver function tests may be related to changes in cytokines and alteration in circadian rhythms of hormones during 30 days of fasting.^{4,5}

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References

1. Azizi F, Rasouli H. Serum glucose, bilirubin, calcium, phosphorus, protein and albumin concentrations during Ramadan. *Med J Islam Repub Iran.* 1987;1:38-41.
2. Mohammed Z. The Influence of Ramadan fasting on some hematological and biochemical parameters in healthy adult males. *Iraqi National J for Nursing Specialties.* 2011;24:45-51.
3. Elfert AA, AbouSaif SA, Kader NAA, AbdelAal E, Elfert AY, Moez ATA, et al. A Multicenter Pilot Study of the Effects of Ramadan Fasting on Patients with Liver Cirrhosis. *Tanta Medical Sciences Journal.* 2011;6:33-25.
4. Azizi F. Islamic fasting and health. *Ann Nutr Metab.* 2010;56:273-82. doi: 10.1159/000295848. PubMed PMID: 20424438.
5. Bogdan A, Bouchareb B, Touitou Y. Ramadan fasting alters endocrine and neuroendocrine circadian patterns. Meal-time as a synchronizer in humans? *Life Sci.* 2001;68:1607-15. doi: 10.1016/S0024-3205(01)00966-3. PubMed PMID: 11263673.