The Effect of Fasting on Erectile Function and Sexual Desire on Men in the Month of Ramadan

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Purpose: To determine the effect of Ramadan intermittent fasting on erectile function (EF), sexual desire and serum hormone levels.

Materials and Methods: Eligible male participants completed the two domains of International Index of Erectile Function (IIEF) questionnaire for EF and sexual desire. They also provided information on any known disease, treatment taking, smoking habits and frequency of sexual intercourse. Frequency of sexual intercourse, two domains of IIEF questionnaire, serum hormone levels, body weight before and four-weeks after the end of month of Ramadan were also recorded.

Results: Overall, 45 men, with a mean age of 37 ± 7.2 years, participated in the study. Frequency of sexual intercourse (P = .046), sexual desire (P = .002), body weight (P = .009) and serum follicle stimulating hormone (FSH) level (P = .016) decreased significantly at the end of month of Ramadan compared to baseline. No statistically significant differences were found on EF (P = .714), serum testosterone (P = .847), luteinizing hormone (P = .876), estradiol (P = .098) and dehydroepiandrosterone sulfate levels (P = .290).

Conclusion: Ramadan intermittent fasting might be associated with decrease in sexual desire, frequency of sexual intercourse and serum FSH level.

Keywords: fasting; metabolism; adverse effects; risk factors; sexual dysfunction.

INTRODUCTION

Fasting is a practice that is observed by many cultures and religions. In Islam, during the month of Ramadan, able-bodied Muslims abstain from food, fluid, smoking and sexual relations for 12-14 hours daily at daytime. They eat before sunrise, retire later and consume large meals after sunset to replenish energy and fluid levels. Well-documented effects of Ramadan intermittent fasting (RIF) include changes in circadian rhythms, metabolic and endocrine function, as well as reductions in daytime hydration, blood glucose and body temperature.[1] Collectively these changes may cause physiological and psychological perturbations that could have detrimental effects on sexual function.

To our knowledge, there is only single study on the effect of RIF over intercourse frequency.[2] In that study, Berrada and colleagues examined both sex and found that RIF results in dramatic decrease in frequency of sexual intercourse.[2] One of their study limitations was that they included different marital statuses i.e. single and married which might have affected the result of their study on frequency of sexual intercourse.[2] In this study, we planned to include married men in order to overcome limitation of finding partner.

MATERIALS AND METHODS

Study Participants

This study was completed on 45 volunteer male participants in a tertiary teaching hospital. Participants were selected from staff (doctors and nurses) working in different clinics of the hospital. Participants completed a self-reported questionnaire on demographic, lifestyle characteristics and on erectile function (EF), using the International Index of Erectile Function (IIEF). IIEF is the most reliable measure of EF and has been culturally, linguistically and psychometrically validated.[3] The index uses a 15-item self-administered questionnaire, which comprehensively assesses sexual function in five response domains. In this study, we evaluated two domains of IIEF questionnaire (i) EF (questions 1–5 and 15) and (ii) sexual desire (questions 11 and 12).

Information on any known disease and drug therapy, blood pressure, serum glucose and lipid levels were also obtained. Criteria for inclusion were being married, male, in good health, non-smoker, not taking any medicines and not being on a diet. Additional criteria were having normal EF and fasting during the month of Ramadan. The participant should also have had regular sexual relationship with his wife. Furthermore, wife of the participant should not have been away from the house they live together during the study period. Patients who were under any kind of hormonal treatment and were diagnosed with any kind of cancer were excluded from the study. Other exclusion criteria were using any kind of drugs related with erection e.g. phosphodiesterase type 5 inhibitor and herbal medications in the last 6 months from the study period. Institutional review board approved and granted this study and all the participants provided written informed consent before participation.

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Table. Demographic and clinical characteristics of study subjects at baseline and at the end of study.

Variables	Before Ramadan	End of Ramadan	*P* Value
	(Mean ± SD)	(Mean ± SD)	
Weight (kg)	94.67 ± 17.3	94.00 ± 17.2	.009*
BMI (kg/m^2)	30.15 ± 4.9	29.94 ± 4.9	.009*
Intercourse frequency (number/month)	7.96 ± 2.4	6.62 ± 1.8	.046*
IIEF-Erectile function domain score	28 ± 1	27 ± 1	.714
IIEF-Sexual desire domain score	9 ± 1	6 ± 2	.002*
Serum hormone levels			
Total testosterone (nm/L)	14.93 ± 4.5	15.03 ± 3.6	.847
Free testosterone (nm/L)	0.3 ± 0.06	0.28 ± 0.1	.682
Bioavailable testosterone (nm/L)	6.45 ± 1.36	6.67 ± 1.2	.512
SHBG (nm/L)	29.11 ± 12.8	29.27 ± 12.9	.817
DHEAS (µm/L)	7.4 ± 3.2	7.2 ± 3.4	.290
LH (IU/L)	2.93 ± 1.7	2.98 ± 1.7	.876
FSH (IU/L)	2.97 ± 1.8	2.68 ± 1.7	.016*
Estradiol (pmol/L)	83.3 ± 21.5	78.23 ± 22.6	.098

Abbreviations: BMI, Body Mass Index; IIEF, International Index of Erectile Function; SHBG, sex hormone binding globulin; DHEAS, dehydroepiandrosterone sulfate; LH, luteinizing hormone; FSH, follicle stimulating hormone.
*$P < .05$ and statistically significant.

Evaluations

Hormonal evaluation tests and frequency questions were applied one week before the month of Ramadan and at the end of Ramadan (29th and 30th day of month of Ramadan). Blood samples were taken from each participant early in the morning (7:00-8:00 am) by a technician who was assigned by the research center for this study. Therefore, the participants did not wait in the queue with other patients. Weight and height were measured in duplicate using a digital scale and standard stadiometer. Body mass index (BMI) was calculated as weight in kg/height in m^2. Serum levels of following sex hormones were measured: total testosterone, free testosterone, bioavailable testosterone, sex hormone binding globulin (SHBG), dehydroepiandrosterone sulfate (DHEAS), luteinizing hormone (LH), follicle stimulating hormone (FSH) and Estradiol.

Statistical Analysis

Qualitative and quantitative data values were expressed as frequency (percentage) and mean ± SD. Quantitative variables means between pre- and post-RIF results were compared using paired *t*-test. A two-sided *P* value of $< .05$ was considered to be statistically significant. All statistical analyses were done using Statistical Package for the Social Science (SPSS Inc, Chicago, Illinois, USA) version 19.0.

Main Outcome Measures

The primary end points of the present study were to assess whether RIF affect baseline EF, sexual desire and monthly frequency score of sexual intercourse four weeks later (at the end of the month of Ramadan). The secondary end point was to compare baseline serum hormone levels with the study end results.

RESULTS

The final cohort included 45 male participants with a mean age ± SD of 37±7.2 years (range, 27-56), who fulfilled the inclusion criteria, were identified and included in this study. There were no dropouts during the study. At baseline, the mean IIEF-EF and sexual desire scores for the entire cohort were 28 ± 1 and 9 ± 1, respectively. At the end of RIF, the mean IIEF-EF and sexual desire scores for the entire cohort were 27 ± 1 and 6 ± 2, respectively ($P < .05$ for sexual desire). Mean serum hormone levels and characteristics of participants are shown in **Table**. Body weight, BMI, FSH and frequency of sexual intercourse also decreased significantly after RIF ($P < .05$). No statistically significant differences were found in serum testosterone, LH, estradiol and DHEAS levels that were taken before and at the end of month of Ramadan (**Table**).

DISCUSSION

Fasting during the month of Ramadan leads to alterations in feeding habits, sleep duration, pattern and architecture.[4] Several studies have demonstrated that psychomotor performance, subjective alertness and memory are adversely affected during the month of Ramadan.[5,6] The present study examined the effects of RIF on EF, sexual desire, frequency of sexual intercourse and serum hormone levels in men. The results indicated that RIF caused significant decrease in sexual desire and frequency of sexual intercourse during the month of Ramadan compared to previous month. We also demonstrated that serum FSH level and BMI significantly decreased at the end of the month of Ramadan. Although there were some changes in testosterone, estradiol, DHEAS and LH levels, the results were not statistically significant.

Previously, it has been demonstrated that RIF has some effects on physical activity.[1,7] Long-lasting modifications as in RIF have been shown to result in a phase delay of many biological rhythms.[5,8] In our study, we found

that the frequency of sexual intercourse in married men decreased nearly 20% at the end of month of Ramadan after 4 weeks of intermittent fasting. Earlier, frequency of sexual intercourse has been investigated in only one study by Berrada and colleagues.[2] In the latter study, investigators found that the frequency of 2 to 3 times per week (for 56%) before Ramadan, dropped to 29% of participants.[2] Surprisingly, 16% of the study group did not have sexual intercourse during Ramadan, although all the participants had sexual intercourse on at least one occasion the month before.[2] In the present study, all of participants had sexual intercourse at least two times per month even during Ramadan. This controversy might be attributed to the differences in marital status of two studies. It is noteworthy that nearly one third (27.4%) of the participants in Berrada and colleagues' study were single.[2] Since there was no information on their partners and relations, the single participants might not have had an opportunity for sexual intercourse. Additionally, out of wedlock sexual relation is forbidden in Islam as in other monotheistic religions. The latter might have also affected the study results of single participants of Berrada and colleagues. The results of the present study also showed that there is a significant decrease in sexual desire, the drop was nearly 30%. From a practical standpoint, our findings imply that less desire might have led less frequent sexual intercourse.

In literature, there are conflicting results on change of serum FSH levels during the month of Ramadan.[9,10] Bogdan and colleagues found statistically significant decrease in the 24-hour mean level of serum FSH during Ramadan.[9] As has been found in the latter study, the current study showed that serum FSH level decreased significantly at the end of four-week RIF. On the other hand, Mesbahzadeh and colleagues showed significant increase in serum FSH levels in single male participants.[10] In interpreting the findings of the Mesbahzadeh and colleagues' study, it is important to note that there was no information on sexual activity of the participants which might have influenced hormone results.[10]

In the current study, although it was statistically no significant, we demonstrated that participants had higher serum testosterone and lower estradiol levels at the end of RIF. The results of the present study also showed that there was, albeit small, significant decrease of approximately 0.7 kg in body weight of our participants. The altered testosterone/estrogen ratio might be explained, in part, by weight loss. The study by Fejes and colleagues is particularly informative in respect to the relation between testosterone/estradiol ratio and BMI.[11] In their study, they confirmed that testosterone/estradiol ratio was significantly reduced in the high BMI group as compared to the low BMI group.[11] Another explanation for testosterone/estradiol ratio might be changing in sleeping pattern during the month of Ramadan. It has been reported that the average sleep time was one-hour shorter during Ramadan than it had been during the control period.[8]

To our knowledge, this is the second study that investigated the effects of RIF on the EF and sexual desire. The effects of fasting during Ramadan month on EF and serum hormones in Muslim men were not researched together. Our results carry important clinical implications. In particular, they suggest that RIF affect serum FSH levels and frequency of sexual intercourse. On the other hand, the present study might have some limitations. A limitation of this study is that we did not record participants' diet and sleeping pattern details. Since the main purpose of our study was to consider the modifications in serum hormone levels and sexual life in participating subjects observing the rule of Ramadan, we did not attempt to change the subjects' environmental conditions or behavioral customs, including their eating habits and sleeping times. Additionally, the differences of parameters in this study are coming from smaller sample size. Therefore further studies with larger sample sizes are needed for more confirmatory and to generalize the findings.

CONCLUSION

In conclusion, our study demonstrated that, fasting during the month of Ramadan has an impact on sexual life. The frequency of sexual intercourse and sexual desire of the subjects studied here were reduced significantly. On the other hand, RIF restrictions do not seem to change the sexual hormone levels, except for FSH.

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CONFLICT OF INTEREST

None declared.

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