

Effect of Ramadan Fasting on Sex Hormones in Infertile Male

Dr. Sajeda Al-Chalabi

Assist. Proff/Dept of Physiology/College of Medicine

Received 21/ 2/2013 Accepted 10/4/2013

Abstract

Ramadan fasting is one of the 5 pillars of Islam and one of the most significant Ibadat (worships) of Islam. Throughout the world, millions of Muslims fast during Ramadan to fulfill this religious obligation. Aims: The **aim** of the study is to determine changes in the serum concentrations of gonadotropins, testosterone and prolactin hormones in infertile males after fasting of Ramadan and whether fasting improves fertility in the male. **Participants and Methods:** This is a case series study was conducted on 54 infertile male subjects aged (25-50 years) who fasted during Ramadan. Two blood samples were taken from each patient, one before and the other after fasting of Ramadan. Serum FSH, LH, prolactin and testosterone measurement was done by using Enzyme Linked Immune Sorbent Assay (ELISA). **Results:** There was no significant difference in serum FSH, LH, prolactin hormones when we compared them before and after Ramadan fasting. Concerning serum testosterone hormone, there was a decrease in its level after fasting but not reach significance when compared with its level before fasting. **Conclusion:** Serum levels of FSH, LH, prolactin and testosterone were unchanged after fasting of Ramadan.

Key Words: sex hormones, male infertility.

تأثير صيام شهر رمضان على الهرمونات الجنسية في الرجال العقيمين

د. ساجدة سعيد الجبلي

المخلص

صيام شهر رمضان هو واحد من الفرائض الخمسة واحد من اهم العبادات في الاسلام. ملايين من المسلمين يصومون خلال رمضان لانجاز هذا الالتزام الديني في كافة انحاء العالم. **الاهداف:** تهدف هذه الدراسة تحديد التغيرات في تركيز الهرمونات المحفزة للغدد التناسلية ، هرمون التستوستيرون وهرمون اللين في مصل الدم للرجال العقيمين بعد صيام شهر رمضان وفيما اذا الصيام يحسن الخصوبة عند الرجال. **طريقة العمل والمشاركين:** هذه دراسة للحالات المتسلسلة اجريت على اربعة وخمسون رجل عقيم تتراوح اعمارهم بين (25-50 سنة) من اللذين صامو خلال رمضان. تم اخذ عينتان من الدم لكل مريض ، واحد قبل الصيام والآخر بعد صيام رمضان. **ELISA** تم قياس الهرمون المحفز للجريب، الهرمون اللوتيني، هرمون اللين وهرمون التستوستيرون باستخدام طريقة

النتائج: لوحظ عدم وجود فرق هام في الهرمون المحفز للجريب، الهرمون اللوتيني وهرمون اللين عندما تمت مقارنتهم قبل وبعد صيام رمضان. فيما يتعلق بهرمون التستوستيرون، كان هناك قلة في مستواه بعد الصيام ولكن لم يصل الى الالهية عندما قورن مع مستواه قبل الصيام.

الاستنتاج: لم يتغير مستوى الهرمون المحفز للجريب، الهرمون اللوتيني وهرمون اللين وهرمون التستوستيرون بعد صيام رمضان.

الكلمات الدليلية: الهرمونات الجنسية، عقم الرجال.

Introduction

Fasting, a principal obligation of Islam is practiced for a complete month, the fasting involves abstaining from eating and drinking, smoking and intercourse from sunrise to sunset. During the past 2 decades researchers have found that abstinence from eating and drinking accompanied by a change in sleeping and waking pattern may cause changes in the physiology and functioning of body's hormonal system. (1, 2, 3)

In Islam, fasting is compulsory for healthy adult Moslems in the month of Ramadan. Islamic fasting differs from other types of fasting, in usual fasting, one may consume fluids which contracts with the Islamic type of fasting where drinking and eating is forbidden and the fast is only broken at the exact time of the day (sunset). In addition, in Islamic fasting there is a change in the life style (sleep, food and work) which is unclear if it causes a variation in the functions of the body's hormonal system. (4, 5)

Some studies have reported a relationship between fasting and gonadotropin releasing hormone (GnRH) (6, 7, 8) and luteinizing hormone LH (9, 10, 11). Moreover, some studies have stated that severe malnutrition and periods of fasting

affect GnRH and LH levels by continuous stimulation of one of the physiologic peptic neurotransmitters called Neuropeptide Y (NPY) (12, 13, 14, 15, 16) or estrogen receptors (17, 18) which leads to reduce the number of LH pulses (19, 20).

Unfortunately, not much data about the effect on gonadotropin in Islamic fasting has been published. However, a study by Mesbahzadeh et al 2005 has reported the mean LH level in young men did not change during Ramadan (21).

In Islam, it is recommended that abstinence from eating and drinking leads to an improvement in both physical and psychological health during holy Ramadan but the impacts of Islamic fasting on male reproductive hormones have not been totally evaluated. However, increasing numbers of patients started to enquire about how best to manage their fertility state.

In this research, the aim is to study the effect of Ramadan fasting on gonadotropin levels (FSH&LH), prolactin and testosterone in infertile men.

Subjects and Methods

A total of 54 infertile men aged (25-50 years), were considered for this self-controlled study. Initially, all participants,

after a related description, signed an informed consent and were entered into the study. Men who are with thyroid disorder, varicocele, drug consumers and smokers were excluded from the study.

Men with primary and secondary infertility, oligospermics and azoospermics were included in the study. Only 40 men shared in the study and the remaining 14 men were excluded because they have only before fasting readings and they did not come after Ramadan.

The study was performed in two stages: before Ramadan and then directly after Ramadan. Blood samples were taken at 9 am for measuring serum FSH, LH, prolactin and testosterone. Serums were frozen and then taken for the laboratory for the determination of the hormone levels using ELISA technique.

Paired t- test was used to compare between means of variables, p- value less than 0.05 was accepted as significant value.

Results

Table 1 shows that the mean LH levels did not change significantly after Ramadan fasting. The mean FSH levels did not change significantly in comparison with the before fasting samples. There were no significant changes in serum prolactin after Ramadan fasting. Mean testosterone levels decreased after Ramadan fasting but not reach significance.

Discussion

There is no significant difference of serum LH concentration after Ramadan fasting as compared with that before fasting,

, this in agreement with Kamal Mansi and Masalmah Amneh 2007(22).

There was alterations in serum concentration of FSH, LH, prolactin and testosterone this in agreement with other authors (23) but disagrees with Seven Rojdmak(24). This can be explained by the negative feedback system that controls testosterone secretion (25). Serum prolactin levels not changed & this in agreement with Bakir et al (2, 4).

It has been reported that despite the disturbance of biological processes of the body caused by the change in the times of eating and sleeping, the endocrine system does not change the concentration of pituitary and sex hormones (3, 4)

Serum FSH level remained unchanged after Ramadan fasting and this disagrees with Kamal & Masalmeh who reported an increase in serum FSH during Ramadan fasting, this can be explained by the normal level of testosterone for our patients. The present results of the after fasting samples of serum testosterone showed no difference from those of before fasting and this disagrees with Mesbahzadeh B, Ghiravani Z, and Mehrjoofard H(21) who found decreased serum testosterone and increased in serum FSH during Ramadan fasting.

Really, I hoped to take blood samples and do measurement of these hormones during the last week of Ramadan to show the effect of Ramadan fasting on male sex hormones but the limitation of this study was that our infertile male patients did not visit infertility clinic during Ramadan in our locality.

The present study conclude that the fasting of Ramadan produces no changes in the secretion of gonadotropins and sex hormone among infertile males.

References

- 1-Sajed KM, Akhtar M, Malik G. Ramadan fasting and thyroid hormone profile. *J of Pakistan Med Assoc.* 1991; 41(9):213-6.
- 2-Bakir SM et al. The effect of Ramadan fast on the diurnal change of total calcium, parathyroid hormone and calcitonin. *Med J of Cairo University.*1994; 62(2):485-90.
- 3- Sulemani RA. The effect of Ramadan fasting on thyroid functions in healthy male subjects. *Nutr Res.*1988; 8(5): 549-52.
- 4-Bakir SM, KordyMMT, Gader AMA, Karra o. The effect of Ramadan fasting on the levels of gonadotropins. *J Islamic Med Assoc.* 1992; 24:40-43.
- 5-Ramadan J. Does fasting during Ramadan alter body composition, blood constituents and physical performance? *Med Princ Pract.* 2002; 11 suppl2:41-46.
- 6-Azizi F. Serum levels of prolactin, thyrotropin and thyroid hormones. TRH responsiveness and male reproductive function in intermittent Islammic fasting. *Med J IRI.* 1991; 5:145-148.
- 7-Matsuyama S, Ohkura S, Ichimaru T, Sakurai K, Tsukamura H, Maeda KI, et al. Simultaneous observation of the GnRH pulse generator activity and plasma concentration of metabolites and insulin during fasting and subsequent refeeding periods in shiba goats. *J Reprod Dev.* 2004;50(6):697-704.
- 8-Nagatani S, Guthikonda P, Thompson RC, Tsukamura H, Maeda KI, Foster DL. Evidence for GnRH regulation by Leptin: Leptin administration prevents reduced pulsatile LH secretion during fasting. *Neuroendocrinology.* 1998; 67(6):370-376.
- 9-Chen MD, O Byrne KT, Chiappini SE, Hotchkiss J, Knobil E. Hypoglycemic stress and gonadotropin releasing hormone pulse generator activity in the rhesus monkey: role of the ovary. *Neuroendocrinology.*1992; 56(5):666-673.
- 10-Tanaka T, Akkaboshi N, Inoue Y, Kamomae H, Kaneda. Fasting- induced suppression luteinizing hormone secretion is to body energy status in ovariectomized goats. *Amin reprod Sci.* 2002; 72(3-4):185-196.
- 11-Maeda K, Tsukamura H. Neuroendocrine mechanism mediating fasting includes suppression of luteinizing hormone secretion in female rats. *Acta Nerobiol Exp.* 1996; 56(3):787-796.
- 12-Estacio MAC, Yamada S, Tsukamura H, Hironnagi K, Maeda K. Effect of fasting and immobilization stress on estrogen receptor immunoreactivity in brain in ovariectomized female rats. *Brain Res.* 1996;717(1-2):55-61.
- 13-Sadr F, Afshar M, Sarboluki Sh. Effect of fasting on glucose, lipids, body weight and blood pressure among non-insulin dependent diabetes mellitus. *Feyz, Kashan University of Medical Sciences & Health Services.* 1998; 6(2):71-76.
- 14-Karia SP, Karia PS. Nutritional infertility: the role of the interconnected

hypothalamic neuropeptide Y- galanin-opioid network.Kront Neuroendocrinol. 1996; 17:371-401.

15-Pelleymounter MA, Cullen MJ, Baker MB,Hecht R, Winters D, Boon e T et al. Effects of the obese gene product on body weight regulation in ob/ob mice.Science.1995;269:540-543.

16-Wade GN,Schneider J. Metabolic levels and reproduction in female mammals. Neurosci Biobehav Rev.1992; 16:235-272.

17- Reyes BA, Tsukamura H, Lanson H, Estasica MA, Hirunagi K, Maeda K.Temporal expression of estrogen receptor alpha in the hypothalamus and medulla oblongata during fasting: a role of noradrenergic neuron. J Endocrinol .2006; 190(3):593-600.

18-Jones JE, Wade GN,.acute fasting decreases sexual receptivity and neural estrogen receptor –alpha in female rats.Physiol Behave. 2002; 77(1):19-25.

19- Samules MH, Kramer P. Differential effects of short term fasting on pulsatile thyrotropin, gonadotropin and alpha subunit secretion in healthy men, a clinical research center study. J Clin Endocrinol Metab. 1996; 80(1):32-36.

20-Olsen BR, Grtledge T, Sebring N, Defensor R, Neurranl. Short term

fasting effect Luteinizing hormone secretory dynamics but not reproductive function in normal – weight sedentary women.J Clin Endocrinol Metab 1995;80(4):1187-1193.

21-Mesbaheadeh B, Ghiravani Z, Mhrjoofard H. Effect of Ramadan fasting on secretion of sex hormones in healthy single males. East Mediterr Health J.2005;11(5-6):1120-1123.

22-Kamal M, and Masalmeh A. Impact of Ramadan fasting on metabolism and on serum level of some hormones among healthy Jordanian students. J Med Scien.2007; 7:755-761.

23-Suryanarayano BV, Kent JR, Meister Land Parlow AF. Pituitary- gonadal axis during prolonged total starvation in obese men. Is J Clin Nutr 1969; 22:767-767.

24-Sven Rojdmarm. Influence of short term fasting on the pituitary-testicular Axis in normal men.Horm Res. 1987; 25:140-146.

25-Abbas SM and AH Basalamah. Effects of Ramadan fasting on male fertility. Arch Androll1989; 16:161-166.

Table 1: Comparison of mean serum hormonal levels in infertile males before and after fasting of Ramadan.

| Parameter | Before fasting | After fasting | p-value |
|--------------------|----------------|---------------|---------|
| LH mIU/ml | 6.57±0.89 | 6.53±0.68 | NS |
| FSH mIU/ml | 8.33±0.95 | 8.39±0.96 | NS |
| PRL ng/ml | 13.21±1.77 | 13.07±1.79 | NS |
| Testosterone ng/ml | 5.02±0.95 | 4.81±1.01 | NS |

*paired t-test was used