

ORIGINAL ARTICLE

Effect Of Ramadan Fasting On Renal Function Markers In Healthy Adults From Aurangabad.

Shilpa B. Asegaonkar^a, Ishrat Kareem^b, Jayshree S. Bavikar^c, Avinash Pagdhune^d,
Sunita Aghade^e, Anand P. Thorat^f

*a-Assistant Professor b,c-Associate Professor,d,e-Senior Resident f-Professor and Head
Department of Biochemistry, Government Medical College, Aurangabad, Maharashtra, India.*

Abstract:

Background: Ramadan fasting is a religious obligation followed by Muslims worldwide. No intake of food and water from sunrise to sunset often results in changed hydration status. Generally there is belief of renal dysfunction due to dehydration during Ramadan fasting. However, there is scarcity of scientific literature regarding its effects on renal function in healthy individuals. This study was aimed to evaluate alterations in renal functions due to long intermittent fasting schedule in the holy month of Ramadan.

Material and Methods:

Thirty three normal healthy volunteers (age group 23-52 years) from the same large joint family were enrolled in this study. Blood and urine samples were collected twice: first, one day before Ramadan after a 12-hour overnight fast (baseline) and second on the 28th day of Ramadan. Blood samples were assayed for urea, creatinine and uric acid levels and urine for microalbuminuria.

Results and discussion:

Mean age of the subjects was 43.8±5.4 years. There were slight but nonsignificant reductions in blood urea, serum creatinine, uric acid levels and microalbuminuria of the participants ($p > 0.05$) from pre Ramadan to post Ramadan state. Our study findings revealed no significant

impact of long intermittent fast of Ramadan on renal function markers. Mean difference between pre Ramadan and post Ramadan values of blood urea was 2.4 mg%, serum creatinine was 0.2 mg%, uric acid 0.6 mg% and microalbuminuria 3 mg/dl which are statistically not significant.

Conclusion:

Among healthy individuals renal functions are not altered due to Ramadan fasting.

Key words:

Ramadan fast, urea, creatinine, uric acid, microalbuminuria.

Introduction:

Ramadan fasting is a religious obligation followed by Muslims worldwide. In this month, there is no intake of food and water from sunrise to sunset. Hence energy and water intake is often reduced resulting in changed hydration status. Also there is alteration in the pattern of diet, sleep and behavior of people practicing Ramadan fasting. In this holiest month, two meals are consumed, one before sunrise called Suhore and another meal after sunset called Iftar. ^[1] Islamic fasting is unique physiological model

of fasting differing from experimental fasting because sometimes period of abstinence from liquid and food may extend for more than 12 hours. [2]

Decreased consumption of fluids, that too only in nocturnal period has effect on hydration status and body mass. [3] Generally there is belief of renal dysfunction due to dehydration during Ramadan fasting. However, there is scarcity of scientific literature regarding its effects on renal function in healthy individuals. This study was aimed to evaluate alterations in renal functions due to long intermittent fasting schedule in the holy month of Ramadan.

Materials and Methods:

Present study was conducted as per the guidelines of Institutional Ethics Committee. Thirty three normal healthy volunteers (age group 23-52 years) from the same large joint family were enrolled in this before after study. All participants had the same diet, behavior, culture and level of physical activity. Participants practiced fasting from sunrise to sunset for at least 25 days during Ramadan. Informed consents were obtained from all the participants.

Blood and urine samples were collected twice: first, one day before Ramadan after a 12-hour overnight fast (baseline) and second on the 28th day of Ramadan, just before sunset. Urine samples were collected in sterile container. To avoid day to day laboratory variation, all blood and urine samples were assayed on the same day in a single batch. After serum separation, blood urea, serum creatinine, uric acid was assayed using commercial kits from Erba on fully automated chemistry analyzer from Transasia. For microalbuminuria, its quantitative estimation was done by turbidimetric immunoassay using commercial kits from AGAPPE diagnostics.

Statistical Analysis:

Data was compiled and analyzed using SPSSv10 software package. It was expressed as mean +/- S.D. (standard deviation). Student's paired 't' test was used to compare pre and post Ramadan status variables. Cut off value for significant p values considered was 0.05.

Results:

Mean age of the subjects was 43.8 +/- 5.4 years. There were slight but nonsignificant reductions in blood urea, serum creatinine, uric acid levels and microalbuminuria of the participants ($p > 0.05$) from Pre Ramadan to post Ramadan state. This data pertaining to the effect of fast on renal function markers has been summarized in the following table.

Table 1: Presentation of biochemical parameters before and after Ramadan among studied participants.

Variables	Before Ramadan	After Ramadan	Difference in Mean	P value
	Mean \pm S.D.	Mean \pm S.D.		
Blood Urea mg%	24.6 \pm 3.8	22.4 \pm 2.2	2.4 mg%	0.062 NS
Serum Creatinine mg%	1.1 \pm 0.3	0.92 \pm 0.2	0.2 mg%	0.059 NS
Serum Uric acid mg%	5.8 \pm 1.2	5.2 \pm 1.2	0.6 mg%	0.063 NS
Microalbuminuria mg/dl	32 \pm 12	29 \pm 8	3 units	0.06 NS

NS- Not significant

Discussion:

Present work was aimed to ascertain whether fasting in Ramadan has beneficial or detrimental effect on renal function due to restricted intake of fluids for long period. Our study findings revealed no significant impact of long intermittent fast of Ramadan on renal function markers. Mean difference between pre Ramadan and post Ramadan values of blood urea was 2.4 mg%, serum creatinine was 0.2 mg%, uric acid 0.6 mg% and microalbuminuria 3 mg/dl which are statistically not significant. Confounders' effects were kept minimal by including all subjects from same family for recording baseline and post Ramadan samples.

Changed dietary pattern, not only with respect to quantity but quality also with no fluid intake in day time and altered lifestyle is expected to alter functioning of kidney. There are conflicting results about effects of Ramadan fasting on renal functioning.^[4] Saada A observed significant rise in blood urea and serum creatinine levels while Indral et al found significant reduction in urea and creatinine values in Ramadan fasting group.^[5,6] Nomani et al. reported a significant increase in blood urea level by the end of Ramadan.^[7] Azizi in their study stated that during long-term hunger pangs, serum uric acid increases abnormally, which may be caused by Glomerular filtration and release of uric acid.^[8] Effect of Ramadan fast on renal function has been wisely studied in patients of hypertension, type 2 diabetes mellitus and among individuals performing physical exercise demonstrating no harmful effects.^[9] Zahid observed low levels of serum uric acid without any difference in urea in his 56 Muslim healthy subjects practicing Ramadan fasting.^[10]

Various researchers studied the effect of fasting on renal function tests -blood urea, serum creatinine and albumin in healthy individuals. They reported small but statistically not significant changes on these parameters. The results of our study are consistent with the previous studies^[10, 11, 12]. Beneficial effect of insignificant reductions in blood urea, creatinine and urinary ACR were observed in a study by Ola A.^[13] Progressive rise in the blood urea nitrogen and reduction in creatinine, but within normal range was observed with the advancement of fasting period in healthy subjects. This could be attributed to dehydration, excessive break down of nucleic acids especially RNA in tissues and restricted energy intake.^[14]

Creatinine which is synthesized endogenously in muscles is better marker to assess function of kidney. It is neither absorbed nor secreted by renal tubules. While blood urea levels depend on dietary protein intake. Uric acid is an end product of purine metabolism and excreted by kidney. Microalbuminuria is an early marker of renal dysfunction.^[15] Khaled Trabelsi and colleagues studied effect of Ramadan fast on renal function after rugby seven matches. They concluded that renal response to matches was not different statistically.^[16] In one of the Malaysian study, tubular dysfunction was observed for temporary period during Ramadan fasting.^[17]

We investigated effect of Ramadan fasting on renal function markers in healthy young individuals which was not significant. Hence practicing Ramadan fast can be advocated in healthy individuals.

Conclusion:

Among healthy individuals renal functions are not altered due to Ramadan fasting. Many

factors can influence the effects of Ramadan fasting on biochemical and physiologic parameters like diet, daily activity, sleep pattern, the season of fasting, socio-economic factors, geography and climate. Hence large-scale coordinated multi-centre studies, with standardized methodology, to explore the issue more extensively are warranted.

Conflicts of interests:

There is no conflict of interest among all authors of the study.

References:

1. Azizi F. Islamic fasting and health. *Ann Nutr Metab.* 2010; 56:273-282.
2. Hadi Abdul Ridha Hadi Khafaji, Abdulbari Bener, Mohammed Osman, Ajayeb Al Merri, Jassim Al Suwaidi. The impact of diurnal fasting during Ramadan on the lipid profile, hs-CRP, and serum leptin in stable cardiac patients. *Vascular Health and Risk Management* 2012;8:7-14.
3. Trabelsi et al.: Effect of fed- versus fasted state resistance training during Ramadan on body composition and selected metabolic parameters in bodybuilders. *Journal of the International Society of Sports Nutrition.* 2013;10:23.
4. Attarzadeh Hosseini SR, Sardar MA, Hezaji K, Farahati S et al. The effect of Ramadan fasting and physical activity on Body Composition, serum Osmolarity Level and Some Parameters of electrolyte in Females *Int J Endocrinol Metab.* 2013; 11(2): 88-94.
5. Saada A, Selselet attou G, Belkacemi L, Ait chabane O, Italhi M, Bekada AM, et al. Effect of Ramadan fasting on glucose, glycosylated haemoglobin, insulin, lipids and proteinous concentrations in women with non-insulin dependent diabetes mellitus. *African J Biotech.* 2010;9(1):87-94
6. Indral M, Satumanl L, Widodo E, Tinny E, Endang S, Soemardini S. Study of some biochemical parameters in young men as effected by Ramadan Fasting. *J Kedokteran Yarsi.* 2007;15(1):6-12.
7. Nomani M. Dietary Fat, Blood cholesterol and Uric Acid Levels during Ramadan Fasting. *Int J Ramadan Fasting Res.*1997;1(1):1-6.
8. Azizi F. Research in Islamic fasting and health. *Ann Saudi Med.*2002;22(3-4):186-91.
9. JB Leiper, AM Molla and AM Molla. Effects on health of fluid restriction during fasting in Ramadan *European Journal of Clinical Nutrition.* 2003;57:Suppl 2, S30-S38
10. Zahid J. Mohammed The Influence of Ramadan Fasting on Some Hematological and Biochemical Parameters in Healthy Adult Males *Iraqi National J. for Nursing Specialties.* 2011;24(1):45-51.
11. Yousef B, Bassam B, Raafat AH. Fasting Ramadan in kidney transplant is safe. *Saudi J kidney Dis Transpl* 2009;20(2):198-200.
12. Aksungar FB, Eren A, Ure S, Teskin O, Ates G. Effect of intermittent fasting on serum lipid levels, coagulation status and plasma homocysteine levels. *Ann Nut Metab*2005; 49: 77-82.
13. Ola A. El-Gendy M. Rokaya, Hassan E. El-Batae, Salwa Tawfeek. Ramadan Fasting Improves Kidney Functions and Ameliorates Oxidative Stress in Diabetic Patients. *World Journal of*

- Medical Sciences.2012;7(1): 38-48.
14. S.A. Nagra, N. Shaista, M.Z.A. Nomani, and A. Ali. Effect of Ramadan Fasting on Serum Protein Concentrations in Male and Female University Students.Canadian Journal of Applied Sciences. 2011; 1(2): 29-42.
15. Inass Taha Renal diseases and Ramadan: A review of the literature. Life Science Journal 2013;10 (3):450-8.
16. Khaled Trabelsi, Haithem Rebai, , Kais el Abed, , Stephen Stannard, , Choumous Kallel, , Zouheir Sahnoun, , Ahmed Hakim, , Nicole Fellman, , Zouheir Tabka. Effect of ramadan fasting on renal function markers and serum electrolytes after a rugby sevens match. IOSR Journal of Pharmacy.2012;2(5):42-50.
17. Cheah S.H., CH'ng S.L, Hussain R. and Duncan M.T. Effects of fasting during Ramadan on urinary excretion in Malaysian Muslims. Br. J. Nutr.1990;63(2): 329-337.

Address for correspondence:

*Dr Shilpa B. Asegaonkar,
C-13 Swarsangam Society New Shrey Nagar, Aurangabad, Maharashtra, India.
Email:b_asegaonkar@yahoo.com*