



Effect of Ramadan Fasting on Renal Functions in Type 2 Diabetic Patients (P-0450)

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Background

Ramadan fasting is a religious pillar carried out by Muslims all over the world. Concerns have been raised over how the practice of fasting from dawn to sunset affects kidney functions in diabetic Muslim patients as it represents a major shift in meal timing and content for practicing Muslims [1]. It is hypothesized that patients with diabetic kidney may experience worsening of their kidney functions [2-3].

Aim

We aimed to evaluate the effects of Ramadan fasting on kidney functions in type 2 diabetic patients.

Subjects and Methods

We recruited 90 subjects with type 2 DM intending to fast Ramadan (2016); where the average fasting time was about 16 hours from 3 am to 7 pm at temperature ranging from 37°C to 40°C with high humidity. They were divided into 30 subjects with albuminuria and renal impairment (group I), 30 subjects with albuminuria and normal kidney functions (group II) and 30 with normal kidney functions and no albuminuria (group III). Fasting blood glucose, 2hours plasma glucose, hemoglobin A1c, fructosamine, serum creatinine, BUN, Estimated glomerular filtration rate and albumin/creatinine ratio were measured two weeks before and after Ramadan.

Results

On comparing the studied groups before and after fasting Ramadan, a significant reduction in HbA1c was found in all studied groups (11.23 ± 2.67 % vs. 9.09 ± 1.95 %, 11.09 ± 2.40 % vs. 8.80 ± 1.78%, 9.28 ± 2.41% vs. 8.21 ± 1.45%, p<0.001, p<0.001, p=0.04 respectively). Regarding the kidney function parameters; there was no significant change in group I but there was a significant decline in these parameters in groups II and III; serum creatinine (1.33 ± 0.05 mg/dl vs. 1.41 ± 0.23 mg/dl, 0.66 ± 0.11 mg/dL vs. 0.93 ± 0.17 mg/dL, 0.70 ± 0.12 mg/dL vs. 0.84 ± 0.16 mg/dL, p=0.101, p<0.001, p<0.001 respectively), eGFR (63.07 ± 3.27 ml/min/1.73m² vs. 59.73 ± 13.25 ml/min/1.73m², 114.00 ± 18.74 ml/min/1.73m² vs. 77.83 ± 16.48 ml/min/1.73m², 111.70 ± 18.60 ml/min/1.73m² vs. 97.50

± 21.19 ml/min/1.73m², p=0.186, p<0.001, p=0.008 respectively), urinary albumin/creatinine ratio (88.40 ± 64.86 mg/g vs 86.03 ± 86.52 mg/g, 71.43 ± 21.17 mg/g vs 112.33 ± 72.40 mg/g, 16.18 ± 7.99 mg/g vs 41.67 ± 22.0 mg/g, p=0.905, p= 0.004, p<0.001 respectively). Regarding significant hypoglycemic events that led to breaking the fast and the need for dose reduction, they were significantly higher in group I when compared to groups II and III (p<0.001, p=0.05) respectively.

Table [1]: Comparison between pre and post fasting according to laboratory data of the studied groups: P>0.05: Non-significant (NS), P< 0.05: Significant (S), P<0.01: Highly significant (HS).

Lab. Data	Group I		t	p	Group II		t	p	Group III		t	p
	Pre	Post			Pre	Post			Pre	Post		
FBS (mg/dL) Mean±SD	185.37±57.20	186.60±38.36	0.043	0.922	204±61.93	227.63±35.49	1.342	0.075	206.30±55.58	225.97±31.77	2.117	0.098
Range	95-390	102-278			100-360	154-286			120-346	169-298		
PostPrandial (mg/dL) Mean±SD	299.83±56.68	288.50±39.24	0.264	0.372	299.57±69.43	316.37±47.54	0.693	0.279	330.07±54.53	344.43±42.84	1.534	0.261
Range	200-420	218-398			150-450	206-401			230-469	257-396		
HbA1c (%) Mean±SD	11.23±2.67	9.09±1.95	7.455	<0.001	11.09±2.40	8.80±1.78	5.492	<0.001	9.28±2.41	8.21±1.45	3.518	0.042
Range	6-18	5.5-13			7-17.4	6.5-15			6-15	5.5-11		
Fructosamine (Umol/L) Mean±SD	275.23±111.12	325.53±125.56	0.857	0.106	252.60±84.99	332.70±218.59	2.342	0.066	265.23±80.96	282.63±96.88	0.871	0.453
Range	100-540	103-612			97-400	120-1103			113-421	168-620		
S.Creatinine (mg/dL) Mean±SD	1.33±0.05	1.41±0.23	1.122	0.101	0.66±0.11	0.93±0.17	4.967	<0.001	0.70±0.12	0.84±0.16	5.687	<0.001
Range	1.3-1.5	1-2			0.5-0.9	0.7-1.3			0.5-0.9	0.6-1.4		
BUN (mg/dL) Mean±SD	14.37±4.49	16.82±7.20	0.857	0.119	12.06±2.67	15.48±4.27	5.791	<0.001	13.42±3.56	14.50±4.22	0.166	0.287
Range	9-26	8-35			7-18	9-27			7-20	9-28		
UrinaryACR (mcg/mg) Mean±SD	88.40±64.86	86.03±86.52	0.194	0.905	71.43±21.17	112.33±72.40	4.716	0.004	16.18±7.99	41.67±22.00	6.748	<0.001
Range	33-284	11-434			43-120	27-330			3-29	15-114		
eGFR (mL/min/1.73m ²) Mean±SD	63.07±3.27	59.73±13.25	0.88	0.186	114.00±18.74	77.83±16.48	7.176	<0.001	112.70±18.60	97.50±21.19	4.114	0.008
Range	61-72	32-86			91-149	46-112			88-148	55-131		

Conclusion

Ramadan fasting appears to have a significant effect on improvement of glycemic control in type 2 diabetic patients. There was a decline in kidney functions in patients with already existing albuminuria but without renal impairment unlike those having albuminuria with renal impairment this may be attributed to the conservative diet regimens and proper fluid intake of these patients for fear of further deterioration of their kidney functions. Patients with normal kidney functions showed decline in their eGFR but still within the normal range. Further studies on a larger scale are needed to assess the effect of Ramadan fasting on type 2 diabetic patients and the possible impact of balanced diet and fluid intake on the renal functions during fasting.

I have no potential conflict of interest to disclose.

References

- Jaleel MA, Raza SA, Fathima FN and Jaleel BN (2011). Ramadan and diabetes: As-Saum (The fasting). Indian J Endocrinol Metab; 15:268-73.
- Junaid J, Bakhit A, Amr MK and Alsuwaida AO (2017). Effects of Ramadan fasting on moderate to severe chronic kidney disease prospective observational study. Saudi Med J; 38(1): 48-52.
- NasrAllah M (2014). Fasting during the month of Ramadan among patients with chronic kidney disease: renal and cardiovascular outcomes. Clin Kidney J; 7(4): 348-353.