THE EFFECT OF RAMADAN FASTING ON CARDIOMETABOLIC RISK FACTORS AND ANTHROPOMETRIC PARAMETERS IN TYPE2 DIABETES

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Introduction

The risk for cardiovascular disease is multifactorial and includes diabetes, hypertension, smoking and dyslipidemia. Most type 2 diabetic patients insist on Ramadan fasting, even if the doctor advises them that fasting is risky to their health. Muslims who fast during Ramadan must abstain from eating, drinking, use of oral medications and smoking with no restrictions on food or fluid intake between sunset and dawn. Pre-Ramadan evaluation is very essential to all diabetic patients to classify them into four risk groups (very high risk, high risk, moderate risk and low risk groups) according to several factors such as type of diabetes, patient medications, individual hypoglycemic risk, presence of complications and or comorbidities, individual social and work circumstances and previous Ramadan experience. Ramadan fasting has both favorable and unfavorable changes in type 2 diabetes. Risks associated with Ramadan fasting include hypoglycemia during fasting, hyperglycemia and DKA after feeding, dehydration and thrombosis.

Aim of the work

To evaluate the effect of Ramadan fasting on cardiometabolic risk factors and anthropometric parameters in subjects with type 2diabetes.

Patients

300 subjects with type 2 diabetes (males and females), their ages ranged from 18 to 70 years and were recruited from the Diabetes and Metabolism Outpatient Clinic of Alexandria Main University Hospital.
The exclusion criteria were type1 diabetic patients, patients had history of recurrent hypoglycemia or history of hypoglycemia unawareness, patients had end stage renal disease or on chronic dialysis and pregnant women who had diabetes or gestational diabetes.

Methods

All the participants were subjected to detailed history taking, measurements of body weight, height, BMI, waist, hip circumference, waist hip ratio and arterial blood pressure. Laboratory tests were done, which included FBS, HBA1c, S. cholesterol, S.TG, HDL-C, LDL-C, S.creatinine, S. uric acid, UACR, e-GFR measurements. All this was done 2 to 6 weeks before Ramadan fasting and repeated 4 to 6 weeks after Ramadan.

Results

The results showed significant reduction in systolic blood pressure, diastolic blood pressure, waist circumference, hip circumference, FBS, HBA1c, S.TG, serum uric acid and UACR after Ramadan fasting. There was also significant increase in HDL-C after Ramadan fasting.
There is a positive correlation between decrease in SBP and decrease in DBP (p<0.001), decrease in SBP and decrease in WC (P=0.004), decrease in SBP and decrease in HC (p<0.001), decrease in DBP and decrease in HC (p<0.001). There is a negative correlation between reduction in DBP and reduction in serum triglycerides (p=0.012) and between decrease in WC and S.TG (p=0.038). There is a negative correlation between reduction in WC and reduction in serum uric acid (p=0.026) and between serum uric acid reduction and HC reduction (p=0.007). There is a positive correlation between reduction in serum uric acid and reduction in serum triglycerides (p=0.002) and between reduction in WC and reduction in UACR (p=0.043). There is a positive correlation between decrease in FBS and decrease in HBA1C (p<0.001). There is a positive correlation between reduction in WC and reduction in HC (p<0.001).

Table (1) Comparison between pre and post Ramadan according to body mass index (kg/m2), blood pressure (mm Hg),ABI, FBG, HbA1c, LDL, HDL, TGs, eGFR and UACR

	Pre-Ramadan	Post-Ramadan	P
Systolic blood pressure (mm Hg)	138.87± 24.96	132.07±20.28	< 0.001*
Diastolic blood pressure (mm Hg)	85.30±10.52	83.75±9.61	0.010*
BMI(kg/m²)	34.11±6.87	34.05±6.91	0.160
WC(cm)	106.87±15.05	105.27±14.87	< 0.001*
HC(cm)	121.35±15.79	119.62±15.31	< 0.001*
S.cholesterol(mg/dl)	173.26±47.47	171.75±45.01	0.394
LDL-C (mg/dL)	1136.61±34.74	115.99±52.02	0.217
HDL-C (mg/dL)	47.60±12.95	51.70±13.14	< 0.001*
TGs (mg/dL)	141.18±74.58	137.86±64.24	0.008*
FBS(mg/dl)	180.18±79.98	161.04±56.80	< 0.001*
HBA1C (%)	9.24±2.39	9.07±2.12	0.010*
S.creatinine(mg/dl)	0.76±0.39	0.72±0.25	0.115
S.uric acid(mg/dl)	4.55±1.9	4.42±1.34	0.004*
eGFR (mL/min/1.73 m²)	98.13±22.40	99.35±21.93	0.353*
UACR (mg/gm. Cr)	67.06±71.20	62.32±74.27	0.021*

Conclusion

Diabetics who are not committed to controlling their blood sugar before Ramadan suffer from risks either hypoglycemia or hyperglycemia by fasting during Ramadan. Post –Ramadan was associated with decrease in serum triglycerides and increase in HDL-C than Pre-Ramadan. So, Ramadan fasting has beneficial effect on lipid profile in type 2 diabetics. Post- Ramadan was associated with lower SBP and DBP than Pre-Ramadan. Ramadan fasting has favorable effects on glycemic pattern which is a decrease in both fasting blood sugar and glycated hemoglobin. Ramadan fasting was associated with lower uric acid and UACR than in Pre-Ramadan in type 2 diabetic patients. Ramadan fasting was associated with lower number of patients having metabolic syndrome.