Original Article

EFFECTS OF RAMADAN FASTING ON BLOOD LIPIDS AND SUGAR

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ABSTRACT

Objective: The purpose of the study was to evaluate the effect of Ramadan fasting on lipid profile and blood sugar.

Setting: Adan Hospital – Kuwait

Subjects and Methods: The study was performed on 60 healthy adult volunteers and was carried out in the month of Ramadan (October – November 2003). Each volunteer had observed fasting for an average 12 hours a day. Blood samples were obtained from them on the 1st and 4th week of Ramadan and were analyzed for total cholesterol [TC], low – density lipoprotein cholesterol [LDLc], very low-density lipoprotein cholesterol [VLDLc], high – density lipoprotein cholesterol [HDLc], Triglyceride [TG] and blood sugar.

Results: The LDLc was significantly reduced at the end of fasting (P< 0.005). A reduction in the average TC value was observed at the end of fasting but the difference was not statistically significant (P<0.16). There was a non-significant rise in the HDLc, TG, VLDLc and blood sugar value at the end of fasting. (P<0.36, P<0.29, P<0.71, P<0.72 respectively)

Conclusion: Ramadan fasting has a statistically beneficial effect on the LDLc.

KEY WORDS: Ramadan, Fasting, Lipid profile, Blood sugar

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INTRODUCTION

Ramadan fasting is one of the pillars of Islam. Muslims abstain from food and drink from dawn to sunset during Ramadan, no special diet or food item is restricted during Ramadan, they eat the regular food allowed for them in the other months of the year but in Ramadan they usually enrich their tables with high fat diets. The fasting time is about 12-19 hours depending on the season in which Ramadan fall and the geographic position of the country.

Apart from the religious and spiritual considerations, it is often a subject of discussion whether or not Ramadan fasting confers any harmful effects on the body so the purpose of the study was to evaluate the effect of Ramadan fasting on lipid profile and blood sugar in a healthy homogenous group of population.

SUBJECTS AND METHODS

Sixty (60) healthy adult volunteers were recruited, their mean age 34.3±8.6 years. The study was carried out in the month of Ramadan (October – November 2003), average duration of fasting was 12 hours a day, volunteers were allowed to eat freely from Iftar to Sahar (sunset to dawn). Blood samples were collected by finger sticks from left index finger, 35–60 microliter of whole blood was

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drawn from each volunteer after about 12 hours of fasting in the 1st [5th,6th,7th days] and 4th [26th ,27th,28th days] week of Ramadan into a cholestech capillary tube.

The TC, LDLc, HDLc, VLDLc, TG and blood sugar were processed by enzymatic method using LDX analyzer. (Cholestech Corporation 3347 investment Boulevard Hayward CA 94545-3808 USA)

Statistical Analysis

The statistical analysis was performed using SPSS (11) software. Quantitative data were reported as mean ± standard deviation and compared using the paired two – tailed student's t test. A probability level of <0.05 was considered statistically significant.

RESULTS

The effect of Ramadan fasting on lipid profile and blood sugar was studied on 60 healthy volunteers. Their mean age was 34.3±8.6 years. The blood parameters of the volunteers in the 1st and 4th week of Ramadan were further studied and compared. (Table-I).

The LDLc was significantly reduced at the end of fasting (P < 0.005). A reduction in the average TC value was observed at the end of fasting but the difference was not statistically significant (P < 0.16). There was non-significant rise in the HDLc, TG, VLDLc and blood sugar values at the end of fasting. (P < 0.36, P < 0.29, P < 0.71, P < 0.72 respectively).

Table-I: Comparison of the Effect of Ramadan Fasting on various parameters

Variables	*1st week of Ramadan*	*4th week of Ramadan*	*p Value*
TC mmol/L	4.69±0.93	4.56±0.89	<0.16
LDLc mmol/L	3.08±0.91	2.88±0.85	<0.005
HDLc mmol/L	1.08±0.35	1.11±0.39	<0.36
VLDLc mmol/L	0.61±0.28	0.63±0.27	<0.71
TG mmol/L	1.33±0.75	1.45±0.99	<0.29
Blood sugar mmol/L	5.58±1.17	5.61±0.97	<0.72

* Mean ± standard deviation

DISCUSSION

The body has regulatory mechanisms that activate during fasting. There is efficient utilization of fat[1] and basal metabolism slows down during fasting[2]. Contrary to the popular thinking, it was found that intake of a moderately high fat diet around 36% of the total energy improved blood cholesterol profile[3,4].

The normal recommended guidelines for daily fat intake is 30% or less energy[5]. On weight basis, suggested fat intake during Ramadan is almost the same as during non-Ramadan days[6].

Hallak and Nomani investigated the effect of hypocaloric diet on men [1800 Kcal/day with 30% fat content] and found no significant effect on total cholesterol level[7].

In our study there was a significant reduction in LDLc (P<0.005) an effect that was observed in the study conducted by A Aldouni et al. who reported significant reduction in LDLc which was maintained one month after Ramadan[8].

The significant reduction in LDLc occurred despite the fact that tendency to consume fried foods was increased during Ramadan. Consumption of increased fried foods suggest a higher intake of fats as compared to non Ramadan days. It appeared as if the quality and quantity of fat intake in Ramadan govern blood cholesterol level[9].

A Aldouni et al in another study suggested that feeding behaviour that occurs during Ramadan beneficially affects serum apolipoprotein metabolism and may contribute to prevention of coronary heart disease[10].

A Temizhan et al examined the relation of fasting to coronary events and found that the number of cases with acute coronary heart disease events were significantly lower in Ramadan than before or after Ramadan[11].

In our study no significant changes were observed on the TC level and HDLc. (p <0.16, P <0.36 respectively). The non-significant elevated serum TG and VLDLc (p <0.29, p <0.71 respectively) observed at the end of fasting may

be attributed to the lipolytic effect of prolonged fasting and this was in line with study by S A Nagra et al who observed increase in serum TG level at the end of fasting[12]. The effect of experimental short term fasting on carbohydrate metabolism has been extensively studied[13,14]. It has been found that a slight decrease in serum glucose to 3.3-3.9 mmol occurs in normal adults a few hours after fasting has begun. However the reduction in serum glucose ceases due to increased gluconeognesis in the liver. This occurs because of a decrease in insulin concentration and a rise in glucagon and sympathetic activity[15].

Few studies have shown the effect of Ramadan fasting on serum glucose[16-20]. Azizi & Rasouli observed a slight decrease in serum glucose in the first days of Ramadan followed by normalization by the 20th day and a slight rise by the 29th day of Ramadan[17]. Others have shown a mild increase[18] or variation in serum glucose concentration[19,20] but all of them fall within physiologic limits[17]. In our study there was a non-significant rise in blood sugar value at the end of fasting ($p < 0.72$) similar to the effect observed in the other studies.

CONCLUSION

Ramadan fasting appears to have significant effect on LDLc which should translate into a significant reduction in coronary risk. To shed more light on the pathophysiological changes in Ramadan fasting, it is recommended that a multicentric international controlled clinical trial be employed to assess the effect of difference in gender, race, physical activity, food habits, sleep pattern and other important variables on physiologic and pathologic conditions during Ramadan fasting.

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