

## Effect of Ramadan fasting on some physiological parameters

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### **Abstract**

Ramadan fasting (RF) is obligatory on all Muslims every year with the exception of sick, travelers & pregnant women. Several studies were done on the effect of RF on many physiological parameters. Some of the results are controversial. The present study was undertaken to establish the effect of RF on some blood parameters. There is a slight decrease in body weight, but the difference is not significant. Also, there is a slight decrease in blood glucose, but this reduction is not a significant reduction. While there is a non-significant increase in blood urea. However, the effect of RF on lipid profile was also done in this study. It was found a significant decrease in serum cholesterol from 162.3 at the beginning of Ramadan to 147.7 mg/dl at the end of Ramadan. And, there is a significant decrease in serum triglycerides from 91.5 to 79.5 mg/dl. Moreover, a significant decrease in serum LDL-cholesterol from 121.7 to 78.1 mg/dl at the end of Ramadan. While, there is a significant increase in serum HDL-cholesterol from 26.1 at the beginning of Ramadan to 33.4 mg/dl at the end of Ramadan. So, HDL is associated with a decreased risk of coronary heart disease. For this reason, Ramadan fasting is a good protection of cardiovascular system.

**Key Words:** Ramadan fasting, body weight, blood glucose, urea, cholesterol, LDL & HDL-cholesterol.

### **Introduction:**

Ramadan fasting (RF) can serve an excellent research model for the study of human metabolism & behavior. Recently, a RF model has been used for various metabolic studies (1,2,3,4).

During RF, the body has regulatory mechanisms that activate during fasting, by an efficient way of utilization of body fat (5). Conflicting results have been reported on the effect of dietary fat on changes in blood cholesterol levels during RF (5,6,7,8,9,10,11). The aim of this study is to evaluate the effect of RF on different physiological parameters & deal with the changes in body weight, blood glucose, urea & cholesterol.

### **Subjects & methods:**

The study was conducted on doctors of Samara hospital. 30 normal healthy male doctors were participated in this study aging between 26 to 30 years, residing in the hostel of hospital. All of them were engaged in similar type of physical activity & taking a

same type of food. The volunteers were allowed to consume whatever they wanted & decrease fat intake in diet.

The study was conducted in the month of Ramadan from 26 of Oct. to 24 of November /2003. Average duration of the fast was about 12 hours & maximum temperature ranged from 10 to 15 C.

Five ml of venous blood was drawn from each volunteer after about 10 hours of fasting on the first & 27th of Ramadan & serum was obtained. Body weight was measured to the nearest 100 gm.

Descriptive statistics were carried out. Student T test was employed to compare the values of different parameters.

### **Results:**

Table 1 summarized the effect of Ramadan fasting on blood parameters & body weight.

There is a slight decrease in body weight from 70.7 to 69.7 kg, but the difference is not significant.

In regard to blood parameters, there is a slight decrease in blood glucose from 3.89 to 3.55

mmol/l. But this reduction in blood glucose is not significant reduction.

While there is non significant increase in blood urea from 4.06 at the beginning of Ramadan to 4.52 mg/dl at the end of Ramadan.

However, the effect of RF on lipid profile was done in this study. It was found a significant decrease in serum cholesterol from 162.3 at the beginning of Ramadan to 147.7 mg/dl at the end of Ramadan. Also,

there is a significant decrease in serum triglycerides from 91.5 at the beginning of Ramadan to 79.5 mg/dl at the end of Ramadan. Moreover, a significant decrease in serum LDL-cholesterol from 121.7 at the beginning of Ramadan to 78.1 mg/dl at the end of Ramadan.

However, there is a significant increase in serum HDL- cholesterol from 26.1 at the beginning of Ramadan to 33.4 mg/dl at the end of Ramadan.

**Table 1 The effect of Ramadan fasting on the mean & standard deviation of body weight & various blood parameters.**

Parameters	1 <sup>st</sup> of Ramadan	End of Ramadan	P value
Body weight (Kg)	70.7 ± 13.2	69.7 ± 13	NS
Glucose, mmol/l	3.89 ± 0.44	3.55 ± 0.29	NS
Urea, mg/dl	4.06 ± 0.67	4.52 ± 0.38	NS
Cholesterol (total), mg/dl	162.3 ± 33.7	147.7 ± 42.6	0.05
Triglycerides, Mg/dl	91.5 ± 23.1	79.5 ± 27	0.05
LDL- cholesterol, mg/dl	121.7 ± 33.4	78.1 ± 43.2	0.05
HDL-cholesterol, mg/dl	26.1 ± 4.6	33.4 ± 9.1	0.05

### **Discussion:**

In the present study, there is non significant change in body weight . So, there is no clear effect of Ramadan fasting on body weight. This may be due to short duration of fasting (30 days) & does not inflict any change on body weight. This result agree with previous works done on normal healthy subjects (12,13).

Blood glucose level showed a non significant change with RF. This result agree with previous studies (2,3). However, the present result do not agree with those studies who reported a significant decrease in blood sugar toward the end of Ramadan. These differences may attributed to the fact that they gave a hypo caloric diet to the volunteers(6,8,10). Whereas in our study, the volunteers were free to consume any thing they wanted. Other possible explanations may be the gender differences of volunteers & environmental / climatic factors (8,10,13,14).

A non significant increase in blood urea was observed toward the end of Ramadan. Different studies conducted on the

effect of RF on blood urea revealed conflicting results. They observed no significant change or increased in this parameter (6,11,12).

Serum total cholesterol, triglycerides & LDL-cholesterol levels show a significant decrease toward the end of Ramadan. While, HDL-cholesterol level was significantly increased. It appears that as if the quality & quantity of fat intake in Ramadan govern blood cholesterol level (2, 6, 7,8,9, 14,15). In the present study, all volunteers were instructed to consume whatever they wanted & decrease fat intake in diet.

The increased in HDL- cholesterol at the end of Ramadan in the present study can be explained by decreased saturated fatty acid intake & decrease in circulating insulin & arise in catecholamine concentration from lipolysis in adipose tissue in response to hypoglycemia of Ramadan fasting (2,5,7,9,16).

HDL- cholesterol removes excess cholesterol from body cell & transport to liver by preventing accumulation of cholesterol in blood, so HDL is associated

with a decreased risk of coronary heart disease. For this reason, Ramadan fasting is a good protection of cardiovascular system.

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