

**Shahid Athar, MD, F.A.C.E., F.A.C.P.**  
**IMANA Board of Regents member**  
**past-chair, IMANA Ethics Committee**

Muslims world wide observe total fasting (no food or water) between dawn to sunset in the month of Ramadan. They do so not for losing weight or any medical benefit, but as it is ordained in Quran which says,

*"O you who believe! Fasting is prescribed to you, as it was prescribed for those before you (i.e. Jews, & Christians) so that you may (learn) self-restraint." ( 2:183 )*

According to Islamic Laws, children below the age of 12, sick patients, travelers, and women who are menstruating or nursing a baby are exempt from fasting. In addition to staying away from food or water for the whole day, they are asked to stay away from sex, smoking or misconduct during the period of fast. In addition, they are encouraged to do more acts of piety i.e. prayer, charity, or reading Quran during this month.

Food is needed by the body to provide energy for immediate use by burning up carbohydrates, that is, sugar. Excess of carbohydrates which cannot be used is stored up as fat tissue in muscles, and as glycogen in liver for future use. Insulin, a hormone from the pancreas, lowers blood sugar and diverts it to other forms of energy storage, that is, glycogen. To be effective, insulin has to be bound to binding sites called receptor. Obese people lack receptor; therefore, they cannot utilize their insulin. This leads to insulin resistance and glucose intolerance.

When one fasts (or decreases carbohydrate intake drastically), it lowers his blood glucose and insulin level. This causes breakdown of glycogen from liver to provide glucose for energy need and breakdown of fat from adipose tissue to provide for energy needs.

On the basis of human physiology described above, semi-starvation (ketogenic) diets have been devised for effective weight control. These diets provide calculated amount of protein in divided doses with plenty of water, multi-vitamins, etc. These effectively lower weight, blood sugar, but because of their side effects, should be used only under supervision of physicians.

Total fasting reduces or eliminates hunger and causes rapid weight loss. In 1975, Allan Cott in his *"Fasting as a Way of life"* noted that "fasting brings a wholesome physiological rest for the digestive tract and central nervous system and normalizes metabolism." It must be pointed out, however, that there are also many adverse effects of total fasting. That includes hypokalemia and cardiac arrhythmia associated with low calorie starvation diets used in unsupervised manner.

### **Studies On Islamic Fasting**

There have been many studies on Ramadan Fasting. In 1996 , an international conference was held in Casablanca , Morocco , under King Hasan Foundation for Health in Ramadan and about 50 papers were presented including those from Dr. Soliman ( Jordan ), Azizi ( Iran ) , Naomani ( USA) and Athar(USA). The conclusions of these presentations were that Ramadan Fasting had beneficial effects on health especially on blood Glucose, blood pressure , lipid profile and weight. No serious adverse effects were noted ( ref 7-10 )

### **Why Islamic Fasting Is Different Than Other Types of Fasting (ref. 7)**

1. As compared to other diet plans, in fasting during Ramadan, there is no malnutrition or inadequate calorie intake since there is no restriction on the type or amount of food intake during Iftaar or Sahar. This was confirmed by M.M.Hussaini (ref. 6) during Ramadan 1974 when he conducted dietary analysis of Muslim students at the University of North Dakota State University at Fargo. He concluded that calorie intake of Muslim students during fasting was at two thirds of NCR- RDA.
2. Fasting, in Ramadan is voluntarily undertaken. It is not a prescribed imposition from a physician. In the hypothalamus part of the brain there is a center called "lipostat" which controls the body mass. When severe and rapid weight loss is achieved by starvation diet, the center does not recognize this as normal and, therefore re-programs itself to cause weight gain rapidly once the person goes off the starvation diet. So the only effective way of losing weight is slow, self-controlled, and gradual weight loss by modifying our behavior, and the attitude about eating while eliminating excess food. Ramadan is a month of self-regulation and self-training in terms of food intake thereby causing hopefully, a permanent change in lipostat reading.
3. In Islamic fasting, we are not subjected to a diet of selective food only (i.e. protein only, fruits only etc). An early breakfast, before dawn is taken and then at sunset fast is broken with something sweet i.e. dates, fruits, juices to warrant any hypoglycemia followed by a regular dinner later on.
4. Additional prayers are prescribed after the dinner, which helps metabolize the food. Using a calorie counter, I counted the amount of calories burnt during extra prayer called Traveeh. It amounted to 200 calories. Islamic prayer called Salat uses all the muscles and joints and can be placed in the category of a mild exercise in terms of caloric out put.
5. Ramadan fasting is actually an exercise in self discipline. For those who are a chain smoker, or nibble food constantly, or drink coffee every hour, it is a good way to break the habit, hoping that the effect will continue after the month is over.
6. Psychological effect of Ramadan fasting are also well observed by the description of people who fast. They describe a feeling of inner peace and tranquility. The

prophet has advised them "If one slanders you or aggresses against you, tell them I am fasting". Thus personal hostility during the month is minimal.

It is my personal experience that within the first few days of Ramadan, I begin to feel better even before losing, a single pound. I work more and pray more; physical stamina and mental alertness improve. As I have my own lab in the office, I usually check my chemistry, that is, blood glucose, cholesterol, triglyceride before the commencement of Ramadan and at its end. I note marked improvement at the end. As I am not overweight, thank God, weight loss is minimal. The few pounds I lose, I regain soon after. Fasting in Ramadan will be a great blessing for the overweight whether with or without mild diabetes (type II). It benefits those also who are given to smoking or nibbling. They can rid themselves of these addictions in this month.

### **Fasting For Medical Patients: Suggested Guidelines (ref. 10)**

As mentioned earlier, patients are exempt from fasting. But some do decide to fast. For physicians treating Muslim patients, the following guidelines are suggested.

- a. Diabetic Patients: Diabetics who are controlled by diet alone can fast and hopefully with weight reduction, their diabetes may even be cured or at least improved. Diabetics who are taking oral hypoglycemia agents along with the diet should exercise extreme caution if they decide to fast. They should reduce their dose to one-third, and take the drug not in the morning, but with Iftar in the evening. If they develop low blood sugar symptoms in the daytime, they should break the fast immediately. *Diabetics taking insulin should not fast.* If they do, at their own risk, they should do so under close supervision and make drastic changes in the insulin dose. For example, eliminate short acting Insulin altogether and take only NPH or Lantus Insulin after Iftar or before Sahoor. Diabetics, if they fast, should still take a diabetic diet during Iftar, Sahoor and dinner. The sweet snacks common in Ramadan are not good for their disease. They should check their blood sugar before breakfast and after ending their fast.
- b. Hypertensive or Cardiac Patients: Those who have mild to moderate high blood pressure along with being overweight should be encouraged to fast, since fasting may help to lower their blood pressure. They should see their physician to adjust medicines. For example, the dose of water pill (diuretic) should be reduced for fear of dehydration and long acting agents like Inderal LA or Tenormin can be given once a day before Sahar. Those with severe hypertension or heart diseases should not fast at all.
- c. Those with Migraine Headache: Even in tension headache, dehydration, or low blood sugar will aggravate the symptoms, but in migraine during fasting, there is an increase in blood free fatty acids, which will directly affect the severity or precipitation of migraine through release of Catecholamines. Patients with migraines are advised not to fast.

- d. Pregnant Women (Normal Pregnancy): This is not an easy situation. Pregnancy is not a medical illness; therefore, the same exemption does not apply. There is no mention of such exemption in Quran. However, the Prophet said the pregnant and nursing women do not fast. This is in line with God not wanting anyone, even a small fetus, to suffer. There is no way of knowing, the damage to the unborn child until the delivery, and that might be too late. In my humble opinion, during the first and third trimester (three months) women should not fast. If however, Ramadan happens to come during the second trimester (4th-6th months) of pregnancy, women may elect to fast provided that (1) her own health is good, and (2) it is done with the permission of her obstetrician and under close supervision. The possible damage to the fetus may not be from malnutrition provided the Iftar and Sahoor are adequate, but from dehydration, from prolonged (10-14 hours) abstinence from water. Therefore it is recommended that Muslim patients, if they do fast, do so under medical supervision.

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Shahid Athar , MD, FACP, FACE , is author of "Islamic Perspective in Medicine" (ATP) and "Health Concerns for Believers" (KAZI). ([sathar3624@aol.com](mailto:sathar3624@aol.com), [www.islam-usa.com](http://www.islam-usa.com))