

## RAMADAN FASTING AND MEDICAL SCIENCE

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### Introduction :

Fasting from dawn to sunset during the ninth Lunar month (Ramadan) of the Muslim calendar every year is obligatory for all healthy adult Muslims, male and female. This religious fast known as 'Siam' in Arabic, means total abstinence from food, drink, smoking and sex during the period of fasting. For the Quranic injunction regarding the fasting in Ramadan vide S2 : 183-185 and 187.<sup>1</sup>

"O those who believe! fasting is enjoined on you, as it was prescribed for the people before you, so that you may be God fearing." (S2 : 183)<sup>1</sup>

(Fasting is prescribed for you) for a certain number of days in the month of Ramadan. But for one who is sick among you, or on a journey, (the same) number of other days; and for those who can afford it, there is a ransom - the feeding of a person in need (poor) - But whoever do the good of his own accord, it is better for him and that ye fast is better for you if you did but know." (S2 : 184)<sup>1</sup>

"The month of Ramadan, in which was revealed the Qur'an, a guidance for mankind, and clear proofs of guidance, and the Criterion (of right and wrong). And whosoever of you witnesses the month, he should fast during the month. But whoever of you is sick or on a journey, (let him fast the same) number of other days. Allah desireth for you ease, He desireth not hardship for you, and (He desireth) that ye should complete the period, and that ye should magnify Allah for having guided you, and that peradventure ye may be thankful (to Him) (S2 : 185)<sup>1</sup>

"It is made lawful for you to go unto your wives on the nights of the fast. They are raiment (dress) for you and ye are raiment for them. Allah is aware that ye were deceiving yourselves in this respect and He hath turned in mercy towards you and relieved you. So hold intercourse with them and seek that which Allah hath ordained for you, and eat and drink until the white thread becometh distinct to you from the black thread of the dawn. Then strictly observe the fast till nightfall and touch them not but be at your devotions in the mosques. These are the limits imposed by Allah, so approach them not. Thus Allah explains His revelations to mankind so that they may be God fearing." (S2 : 187)<sup>1</sup>

Muslims all over the world are observing the Ramadan fasting since the early 7th Century A.C. but only recently research was carried on the effects of Ramadan fasting on health and several papers were published in scientific medical journals.<sup>2-8</sup>

Since Islam is a complete code of life, all its religious injunctions are according to the rules of hygiene and health. This is also true for Ramadan fasting.

The important such medical oriented rules are :

(a) Fasting is not obligatory for the children and very old persons as, long abstinence from food and drink may be harmful for them.

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b) Fasting is not obligatory for the persons of unsound mind as they will be unable to follow the rules of fasting.

c) Sick persons are exempted from fasting (2:184, 103)<sup>1</sup> as they may need nutrition and medicine during the fasting period. They are to complete the number of days fasting after their cure. There is no time limit for that, and they may choose cold smaller days of winter for the purpose.

It may be noted that certain drugs or medicines are now prepared which may be administered once in 24 hours or at about 12-14 hours interval. So, some persons requiring such medication may keep fast inspite of their illness.

d) Menstruating women are not to fast during their period as the loss of blood make them weak. So, fasting may reduce their body resistance. They are to complete the days fasting later on.

e) Mothers of suckling baby, if fasting reduces breast milk, are exempted from fast to be completed later, after the weaning of the child. Thus Islam is also particular about the health of the children.

f) A traveller is also exempted from fast (2:184, 185)<sup>1</sup> due to possible inconvenience in obtaining comfortable residence, taking regular food, timely 'Seher' (Late night meal) and 'iftar' (Breakfast). Besides, travelling itself may cause physical exertion.

In spite of all these concessions, some so-called 'modern Muslims' being influenced by the prevalent anti-religious culture all over the world, specially the West, often try to question the utility of the Ramadan fasting, and some of them openly ignore the Ramadan fast and many do not keep fast secretly. Besides, some physicians (even Muslim) advise their patients not to keep fast without valid medical reason and some even believe that fasting may cause peptic ulcer, though there is no scientific findings to support such a view.

In 1956, while undergoing post graduate training in Pathology in the National Hospital, Queen's Square, London, the then Professor of Pathology Dr. J.N. Cummings once told me that fasting day in the summer may cause damage to the liver. In that year the Ramadan fasting was about 19 hours in London. I asked him if he had any scientific basis for such an assumption for, the Muslims were fasting since early 7th century (more than 1300 years) all over the world in all weathers, yet there is no reason to believe that as a nation they had bad livers. Prof. Cummings replied that he had no knowledge of any scientific study on the subject but he thought that such a long period of fasting, specially in summer, might damage the liver.

On that occasion, I promised that, Allah willing, I would carry on research on the - "Effects of Ramadan Fasting on Health" when I returned home. I strongly felt that such a study was essential.

On my return home in December, 1957, I organised to carry on the study during the following Ramadan in 1958 summer. This study was carried on for long six years, in different phases from 1958 to 1963 in Dhaka and Rajshahi Medical Colleges while working in those places. A number of Colleagues co-operated in these studies and they were my co-authors in all my publications in medical Journals.<sup>2-7</sup>

These series of studies were the first scientific effort to know the effects of Ramadan fasting on health and our study resulted into several scientific publications in the medical journals at home and abroad-mostly in UK.<sup>(2-9)</sup>

The present paper deals with the results of those studies including scientific discussions.

### Results : Effects of Ramadan Fasting on Health

1) **Body weight** - Abstaining from food and drink for several hours (average 14 to 16 hours) may reduce the body weight. In a study<sup>7</sup>, out of 260 subjects, 80% (208) lost body weight, 8.08% (21) showed no change of weight while 11.92% (31) gained weight from one to four pounds. Among those who lost weight, 201 lost from one to ten pounds and the remaining seven lost eleven to 14 pounds. But none of them complained of weakness due to weight loss. The loss of weight was more among young and active subjects. Few obese (over weight) subjects expressed satisfaction on the loss of some body weight. The unchanged weight was mostly among the elderly persons. The reason for gaining weight is probably for better quality of food taken, and more regular timing of taking food in Ramadan. Four weeks after the 'Fast' i.e. Eid-ul-fitr, half of the volunteers who lost weight regained their original body weight.

The control subjects showed a variation of two pounds in their body weight during a period of 8-10 weeks time of study. Thus, Ramadan fasting is rather beneficial to reduce body weight without any marked disadvantage to the subjects.

In higher latitudes where summer days may be nearly 19-20 hours (as in Glasgow and Edinburgh) but no extra suffering was experienced by me and my family in keeping fast there. Lack of thirst and perspiration in that cold weather caused no hardship at all.

2) **The basal metabolic rate (BMR)** - BMR of the fasting subjects were similar to those of the control subjects.<sup>6</sup> One pregnant volunteer showed normal increase of BMR, up to + 26.5 after 24 days of Ramadan fasting, which is physiological in pregnancy.<sup>2</sup>

3) **Blood sugar (glucose) level** - All the fasting subjects showed a fall of blood sugar level, the lowest range of 'fasting' value being 68 to 104 mg%, which is within normal limit. None of the subjects complained of any symptom referable to hypoglycaemia.<sup>2</sup>

Glucose tolerance test (GTT) was done on four subjects to see if there is increased sugar tolerance following day-long fasting. There was no significant change in the GTT curves even after raising the amount of glucose meal from 50 gms to 200 gms.<sup>2</sup>

4) **Gastric acid content** - Gastric juice analysis (Fractional testmeal) was done on 25 subjects in two phases.<sup>3,5</sup> In 20 (80%) subjects there was a distinct tendency of the gastric free HCl (hydrochloric acid) of shifting towards normal range (ISO-chlorhydria). There were 9 hyperacidic subjects, 7 of them became normal. Out of 14 normal subjects 3 showed slight hyperacidity (with no complaint) and 2 became hypoacidic. The two hypoacidic in the beginning turned isochlorhydric.<sup>3,5</sup> (Table 1)

**Table-1** Showing effect of fasting on gastric acidity.

Acidity	Before fasting	After fasting period
Isochlorhydria	14	20
Hyperchlorhydria	9	3
Hypochlorhydria	2	2
Total	25	25

The controls showed no change of pattern.

5) **Other physical findings** - Body temperature, blood pressure, pulse rate, respiration rate, and electro-cardiogram (ECG) showed no appreciable change.<sup>2</sup>

6) **Other biochemical findings** - Fluid balance, kidney and liver function tests showed no abnormality.<sup>2</sup>

Blood cholesterol, blood urea, plasma proteins, serum potassium, sodium, chloride, alkali reserve and calcium levels also showed no significant variation.<sup>2</sup>

7) **Haematological values** - Haemoglobin level, packed cell volume (PCV) and erythrocyte sedimentation rate (ESR) showed no change due to fasting in Ramadan.<sup>2</sup>

In order to see the effect of fasting on the liver, we carried on animal experiment on cat, as liver is supposed to suffer most due to fasting. Both the 'test and control' cats did not show any significant variations in body weight, liver function tests and histologic findings of the liver.<sup>3</sup>

### **Discussion :**

**Body weight-** Ramadan fasting causes harmless and slow loss of body weight in most of the fasting subjects. This may be a better way of treating obesity (overweight) than the current medical practice.

The modern methods of treatment of obesity are : use of de-appetiser drugs leading to less food intake and continuation of taking less amount of food and prolonged starvation with sufficient amount of water, electrolytes and vitamins to lower the body weight drastically in a short time and maintain the lower weight with low calorie diets.<sup>10</sup> Both these methods are difficult for the patient and the second method needs constant medical supervision in a hospital.

The obese people are generally fond of food, so they do not like the de-appetising drugs. Besides, this method has a risk of malnutrition. For rapidly lowering weight, food is withheld for the consecutive days except, water, tea, coffee and vitamins. After the drastic loss of weight, the patient is given food of only 900 calories and gradually increased to 1500 calories, at which level the diet is maintained till the desired weight is obtained. An average adult needs 2500 to 3000 calories per day. So, patients treated by this method will be very weak and it will take a long time to obtain the acceptable weight with fitness.

Jogging, regular physical exercise or long walking are all useful but the control of food intake is also essential. Therefore, to have trouble-less and not-so-uncomfortable method of treating obesity is to observe the 'Ramadan type of fasting' for a period needed for each patient - one to several months, each year. This will be more useful if the patient is allowed only one full meal up to his liking in 24 hours. He should however avoid excess fat and carbohydrate. The importance of Ramadan type of fast instead of arbitrary period of fast is that, for a Muslim such fasting will be 'Nafil' (extra and voluntary) prayer and for the non-Muslims it will ensure strict regimentation which is essential to make it a success. Without a religiously strict regulation, one may be tempted to take some food in the form of a snack or drink, which may make the whole exercise useless. The non-Muslim patients may be allowed only water during the fasting period. The best time of taking the meal may be

after 'Eisha' prayer (night prayer) or regular dinner time. The Muslims may ceremonially break the fast at 'ifter' with water and take some water at the 'Sehr' period (pre-dawn).

Thus Ramadan type of fasting is the best and harmless method of loosing body weight and much superior to the so-called scientific methods.

Regular yearly fasting in Ramadan avoiding excess intake of food specially fat and carbohydrate will help maintain a reasonably normal body weight.

**Gastric acidity :** There is a general tendency to believe that fasting may cause rise of gastric HCL, which is not true. The study mentioned above also shows that fasting is not a cause of hyperacidity. It is an accepted physiological fact that fasting lowers the gastric acid, so the lowest amount of acid is found in the morning fasting sample of gastric juice in a fractional test of gastric juice analysis. The night long fasting leads to this low level. The acidity begins to rise after the ingestion of a 'meal' in the form of 7% alcohol<sup>11</sup> or hot tea liquor without milk and sugar.<sup>9</sup>

Since Ramadan fasting is nothing but change of meal times, the acid of the stomach should be reduced after day long fast. This was found in study mentioned above. The small rise of acid in a small number of subjects may be due to some other factors as 9 of the apperently normal persons had hyperacidity before fasting began. Thus there is no scientific basis to suggest that Ramadan fasting causes hyperacidity.

**Peptic Ulcer :** It is fashionable to blame Ramadan fasting for increased incidence of peptic ulcer and its perforation.<sup>12</sup> Such a claim could not be proved by subsequent study.

The fact is that the actual cause of peptic ulcer is still not known. Several possible factors are considered important. In general, duodenal ulcer is accompanied by hyper acidity of the stomach but it is variable in case of gastric ulcer. Since Ramadan fasting did not cause significant rise of gastice acidity, it is reasonable to suggest that Ramadan fasting has nothing to do with the causation of peptic ulcer. The prisoners of war in the German and the Japanese camps during the Second World War suffered severe starvation but did not show any increasc in the incidence of peptic ulcer among the prisoners. Commenting on this a research scholar stated "fasting does not produce organic disease."<sup>13,14</sup>

But, though Ramadan fasting should not cause peptic ulcer in healthy subjects, patients with active ulcer should not keep fast if fasting gives rise to pain in the abdomen. Such patients may get perforation of the ulcer. The Quran clearly states, i.e. And for those who are sick or travelling they are to complete the number of days afterwards.(2:185)<sup>1</sup>

So, one who suffers from such disease which may further deteriorate due to fasting has no obligation to keep fast, they are exempted from fast. So inspite of such clear injunction if one keeps fast and suffers from perforation, then it is not the faulty of Ramadan fasting rather it is due to disobeying Allah. Such over enthusiasm may lead to inreased incidence of peptic ulcer perforation during Ramadan.(12) Such a show of excessive piety is against the teachings of Islam. Now-a-days, there are effective medicine for the treatment of peptic ulcer. However persons with proved peptic ulcer should not fast unless cured. Some people call any stomach upset as

'acidity' and as such is not a proof of peptic ulcer. Those who have tendency of hyperacidity may be benefitted by fasting.

If fasting in Ramadan has got anything to cause peptic ulcer, then Muslims as a nation should have a higher incidence of peptic ulcer than the non-fasting nations. But the statistics show a different picture. It is interesting to note the following observations :

(a) Peptic ulcer is more common in non-muslim areas of South Indian states of Bombay and Madras than in the prepartitioned North-West India including pre-independent Punjab and Kashmir where Muslims were majority.<sup>13,14,15,16</sup>

(b) Southern part of Nigeria (predominantly non-Muslim) shows high incidence of peptic ulcer, while it is almost unknown among the people of Northern Nigeria (predominantly Muslim) and among the Egyptian villagers (almost all are Muslims).<sup>17</sup>

(c) Indigenous people of Indonesia and Malayasia (mostly Muslims) have very low incidence of peptic ulcer than among the foreign residents in these countries-Dutch, Chinese and non-Muslim Indians.<sup>16,17</sup>

(d) Besides, in countries like Japan and England the incidence of peptic ulcer is much higher than in most of the developing countries. It is due to consumption of refined sugars and cereals, and the modern habit of taking irregular and untimely light meals, snacks, chocolates etc. which cause repeated stimulation of the oxyntic cells to produce excess HCL. The refined carbohydrates are devoid of natural protein coating, which is an amphoteric substances and hence prevents sudden change of pH of the stomach contents.<sup>16,17</sup>

The above observations are enough to state that Ramadan fasting is not a predisposing factor in the causation of the peptic ulcer.

**Stress in Ramadan:** Ramadan fasting is supposed to cause extra stress in our system due to alternation of daily routine such as; awakening in the late hours of night for late night meal (sehri), remaining alert throughout the day against taking food or drink by mistake, the strict discipline of both physical and moral injunctions like avoiding irritation under all provocations and also the additional night prayer of "salat al tarabih."

There is no specific laboratory test to detect stress except circulating eosinophil count and estimation of serum-cholesterol level. Emotional stress may decrease the total eosinophil count. Ramadan fasting did not show any alternation in the serum-cholesterol level. A comparative study of circulating eosinophil count among the fasting and non-fasting subjects did not show changes other than normal diurnal variation.<sup>4</sup>

**Irritability:** During Ramadan fasting some people may show some slowing down of interest and efficiency and occasional irritability in the late afternoon. These are normal physiological phenomena of hunger. Those who are not accustomed to Ramadan fasting will show this slowness and irritability due to hunger. A good Muslim is required to keep fast in Ramadan to please Allah and he or she is advised by the Holy Prophet Muhammad (p.b.u.h) to be patient during fasting and to avoid all sorts of arguments and quarrels. However, some workers believed that such slowness and occasional irritability is due to relatively lower blood sugar level,

though true hypoglycaemia could not be detected. Qureshi (1963)<sup>17</sup> opined that the failure to adapt to the Dynamic stereotype of Pavlov by some, may be responsible for the slowing down and irritability. According to Pavlov, human beings are constantly exposed to nervous stimulation by their environment in the forms of worries, anxieties, petty quarrels and disagreements, financial and social problems, sickness, death of dear ones, political disturbances and even inclement weather. Normal man adapts to these circumstances and such adaptation is termed as 'Dynamic stereotype' by Pavlov. Qureshi further states that it is for this reason probably, fasting is not obligatory for the children, sick persons, travellers and very old persons as they will be unable to adapt to excess stimulation. However, no evidence of extra stress in Ramadan could be found in our study.<sup>4</sup>

'Salat al-tarabih' or the extra 8 to 20 rakats of prayers after regular 'Eisha' prayer may seem to be too much taxing on the fasting persons but in fact it is beneficial for health. After the day-long fasting, one may over-eat at breakfast, but the extra 'salat' will provide a mild exercise to help digestion and get sufficient appetite at 'sehr' or the late night meal.<sup>8</sup>

'Sehr' or the late night-meal just before dawn is also for the benefit of our health. This is a special favour on us on behalf of our Holy Prophet (p.b.u.h) as a Sunnah. However, it is not obligatory but as a respect to the Holy Prophet (p.b.u.h) one is expected to take some food and drink (some milk and water) about 1 to 1½ hours before sun rise, which is known as 'Sehr'. This is scientific and beneficial to health in the sense that such a late night-meal and fluid intake will minimise the hunger and thirst during fasting period. Besides, it will help maintain normal fluid balance of the body. The tradition of 'sehr' supports the declaration of Allah in the Holy Qur'an that "Allah desireth for you ease. He desireth not hardship for you (2:185) and 'Sehr' no doubt makes fasting easier.<sup>8</sup>

#### **Exemption of Menstruating and Puerperal Women from Ramadan Fasting.**

During menstruation and puerperal period (after delivery of the baby), the women suffer from heavy blood loss. As a result they feel weak and fasting during that time may be harmful. So the Merciful Allah has exempted them from fasting even in Ramadan if they are in period or puerperium.

Al-Qur'an mentions the menstruation as a state of illness (2:222)<sup>1</sup>. Though it is regarded as normal physiological phenomena for the women in child bearing age, it is now scientifically found to be a state of illness though mild (18,19,20,21,22).

The Qur'anic word "Aza" also means a state of mild illness. The puerperal period is similar in all respects. So, Al-Hadis of the Holy Prophet exempted them from fasting in Ramadan.

However, they will complete the number of fasting days missed in Ramadan, later according to their convenience.

#### **Conclusion :**

From the above discussion, one may safely conclude that, Ramadan Fasting has no harmful effect on a normal person. A Muslim keeps fast in Ramadan because this is obligatory on him as per the Holy Qur'an, the Last Testament or revelations of Allah.

He does not care whether fasting will be helpful or harmful to the health but will keep fast if one can physically afford, to become a true God-fearing or "muttaqui" as desired by Allah.<sup>1</sup>

But some non-Muslims and doubters among the so-called Muslims try to suggest that fasting may harm our health without any scientific basis. From our study it is clear that fasting is indeed beneficial to us physically, mentally and socially and there is no harm to a healthy adult on whom fasting in Ramadan is obligatory. Above all Ramadan fasting teaches us to feel for the poor and have-nots in the society and development of human qualities of patience, forbearance, self control and tolerance to be an ideal human being.

A doctor, specially a Muslim one should not advise their patients not to keep fast in Ramadan. They should leave it to the person concerned. If the patients can not fast, then they will not fast as Allah allows them to do so in illness. The doctors need not take the responsibility on their shoulders.

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