Gastrointestinal health in Ramadan with special reference to diabetes

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Abstract

Fasting in the month of Ramadan can improve a person's health, but if the correct diet is not followed, one is prone to acquire some ailments related to the digestive health. Dyspeptic symptoms are frequently encountered during Ramadan, with indigestion, bloating and heartburns being more common, particularly after eating too much at Iftar or Suhur meals. Eating in moderation and elimination of foods that can trigger gastroesophageal reflux are helpful. Empiric therapy with a proton pump inhibitor (PPI) is recommended in this setting. Duodenal ulcers and duodenitis are more common during Ramadan and the frequency of complications of peptic ulcer is higher. Patients with duodenal ulcer treated with PPI may fast without any symptoms. Ramadan fasting does not impose serious risks on patients with inflammatory bowel disease. Chronic hepatitis patients show non-significant changes in the liver function tests. However, patients with advanced liver disease may decompensate. As gastrointestinal and liver ailments tend to be more common and severe in diabetics compared with the normal individuals, extra vigilance is needed for the people with diabetes who are allowed to fast by their physicians.

Keywords: Diabetes, Ramadan, Gastroesophageal reflux disease, Peptic ulcer, Gastrointestinal disease, Liver disease.

Introduction

Islam encourages its followers to ensure that they are careful about their health. The month of Ramadan provides Muslims an opportunity to focus on bringing back a balanced and healthy lifestyle. During fasting, abstinence from eating, drinking and smoking is observed from dawn to sunset. Muslims typically eat two meals each day, after sunset and just before dawn. This month calls for giving the stomach a break. The fasting of Ramadan can improve a person's health, but if the correct diet is not followed, one may possibly get some ailments related to the digestive health. The deciding factor is not the fast itself, but rather what is consumed in the non-fasting hours. One may actually gain weight instead of losing some during the month of Ramadan. Those who are physically active during the month of Ramadan appear to cope better than physically inactive individuals.

The majority of health-specific findings related to Ramadan fasting are mixed.[1] The likely causes for these heterogeneous findings lie in the differences in the study designs, social and cultural differences in different parts of the Muslim world, seasonal and climatic differences, the type of food and eating habits, the daily fasting duration, and changes in lifestyle including exercise and physical activities. Duration of fasting may extend between 11 and 18 hours depending on the location and season. Number of subjects who smoke, or take oral medications in a particular study also influence the results. The observance of the Ramadan fast may produce some ill-effects in patients with some diseases. Most of the changes in blood biochemistry and other risk factors that occur during Ramadan are rapidly reversed on return to normal diet, sleep patterns and lifestyle after Ramadan, so long term consequences, if any, would not be expected.

Fasting may precipitate or exacerbate gastrointestinal (GI) complaints. Most common of these are, indigestion and heartburns. Overeating after Iftar and Suhur can not only harm the body but it may also interfere with a person's spiritual growth during the month. A diet that has less than a normal amount of food but is sufficiently balanced will keep a person healthy and active. The diet should not differ too much from one's normal everyday diet. It should contain foods from all the major food groups. Complex carbohydrates are foods that will help release energy slowly during the long hours of fasting and are preferred over refined sugars. Complex carbohydrates are found in grains and seeds, like barley, wheat, oats, beans, lentils, wholemeal flour, and rice, Although Ramadan fasting is safe for all healthy individuals, those with diabetes and various diseases should consult their physicians and follow scientific recommendations.[2]

Gastroesophageal Reflux Disease

Gastrointestinal problems tend to be more common and severe in people with diabetes compared with the nondiabetic population. Reflux eosophagitis is commonly encountered in people with diabetes.[3] Dyspeptic symptoms are higher during Ramadan fasting even in

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normal individuals and many people experience indigestion, bloating and heartburns, particularly after eating too much at the Iftar or Suhur meals. They suffer from epigastric and retrosternal burning and sore belching. Eating too fast without chewing or chewing with mouth open and fatty spicy foods aggravate the problem. Fatty foods stay in the stomach for a longer period and cause excess production of acids. Smoking at Iftar and Suhur and drinking too much of caffeinated and carbonated beverages, such as coffee, tea and cola aggravate the problem. It has been found that diabetics are more likely to develop reflux symptoms.[4] Foods to be avoided are deep-fried foods, e.g. pakoras (fritters), samosas (baked pastry with savoury filling); spicy and oily curries, deep fried kebabs, and paratha (fried flat bread).

Elimination of food that can trigger reflux including chocolate, caffeine, alcohol, and excess tea is advised. Empiric medical therapy with a proton pump inhibitor (PPI) is recommended in this setting.[5] There was a non-significant increase in the total prevalence of laryngopharyngeal reflux disease (LPRD) while fasting compared to the non-fasting state.[6] Fasting subjects must be alert to the effect of LPRD on their throat and voice in particular. Sleeping with head raised with two pillows may help to prevent reflux symptoms.

Peptic Ulcer Disease

Ramadan diet restrictions modify the circadian rhythm in humans. The time-restricted food and water intakes are associated with alteration of the circadian patterns of gastric pH and plasma gastrin.[7] Ramadan fasting is accompanied by an increase of the gastric acidity especially in the daytime. Gastric acidity is maximal at the end of the fasting day. So, a patient with duodenal ulcer is exposed to a high risk of disease reactivation. Incidence of duodenal ulcers and duodenitis is increased during Ramadan.[8] A study assessed the impact of Ramadan on referrals for upper GI endoscopy in a tertiary referral centre. There were no differences in the referral indications, oesophageal and gastric findings, but there was a significant difference in the duodenal findings.[9]

Animal studies have shown that stressful stimuli, such as fasting contribute to the elevated susceptibility of diabetic gastric mucosa to damage The enhanced production of nitric oxide by inducible NOS during food deprivation seems to play an important role in gastric mucosal integrity disturbances in people with diabetes.[10] The frequency of ulcer complications in all populations is statistically higher during the month of Ramadan than the rest of the year. The frequency of the upper gastrointestinal haemorrhage and perforated peptic ulcer is also increased.[11,12] One study showed that more patients presented with upper gastrointestinal bleeding during Ramadan compared with the non-Ramadan months (43 versus 28, respectively).[13] In another study, female patients tended to develop more haemorrhage and perforations during Ramadan.[14] However, one more study pointed out that the frequency of peptic ulcer disease was higher after Ramadan than during Ramadan but this was not statistically significant.[15] In this study, peptic ulcer disease occurred more frequently in the age group 30-49 years. Peptic ulcer perforation was encountered more frequently after Ramadan but the difference was not significant. Regression analysis identified the following variables as predictors of peptic ulcer disease: anorexia, pain, hypertension, smoking, epigastric pain, diabetes and family history.

The patients with duodenal ulcer can fast without risks while using a PPI if the ulcer is healed and Helicobacter pylori is eradicated.[10] A study showed that patients with duodenal ulcer treated with lansoprazole could fast without any added risk.[16]

Inflammatory Bowel Disease

In a study done by Tavakkoli H, et al,[17] sixty patients with IBD, who were in remission and undertook fasting according to their own free will, underwent assessment of quality-of-life (QoL) parameters, psychological state and the severity of symptoms before and after Ramadan. There was no correlation between the number of fasting days and the severity of the disease, QoL and psychological state of the patients. QoL did not change after Ramadan. Ramadan fasting does not impose serious risks on patients with IBD.

Altered Bowel Habits

The prevalence of altered bowel habits, diarrhoea or constipation, is more common in patients who had diabetic complications and a long duration of diabetes.[18] Constipation may be very annoying for someone undertaking a fast. Maintaining good hydration during hours of break, increasing the fibre content of the food, liberal use of fruit and vegetables in the diet, and light exercise helps to keep bowel movements regular. If the problem persists, bulk laxatives likely Ispaghula husk may be of help.[19] Some individuals complain of having loose stools at suhur especially who eat excess pakoras, chickpeas or sweets made from milk. Changes in the Iftar menu may help in ameliorating this complaint. Lactose supplements may be indicated for those who are lactose intolerant.

Liver and Chronic Liver Disease

During Ramadan fasting, glucose homeostasis is

maintained by meals taken during night time before dawn and by liver glycogen stores. Changes in serum lipids are variable and depend on the quality and quantity of food intake, physical activity and exercise, and changes in body weight.[1,2] Patients with well-controlled type 2 diabetes may observe Ramadan fasting, but fasting is not recommended for type 1, noncompliant, poorly controlled and pregnant diabetics.[2]

In a study done in Ramadan by Ajabnoor GM, et al,[20] glucose concentration was kept within normal range, with a significant increase in the morning meal. Mean morning concentration of leptin was significantly higher than pre-Ramadan values (p=0.001), in contrast to that of adiponectin, which was significantly lower (p<0.001). These changes were associated with increased insulin resistance in morning and evening. Concentrations of high sensitivity C-reactive protein (hsCRP) were lower during Ramadan than those during regular living conditions, however, normal circadian fluctuation was abolished (p=0.49). Even though means of liver enzymes, total bilirubin, total protein and albumin were all decreased during Ramadan, statistically lower means were only noted for GGT, total protein, and albumin (p=0.018, 0.002 and 0.001 respectively).

A study was done on rats who fasted (12 hours) and then were refed (12 hours) daily for 30 days, as practised by Muslims during Ramadan.[21] Ramadan-type fasting caused a significant decline in serum glucose, cholesterol and lactate dehydrogenase activity, whereas inorganic phosphate increased but blood urea nitrogen was not changed. Fasting resulted in increased activities of intestinal lactate (+34%), isocitrate (+63%), succinate (+83%) and malate (+106%) dehydrogenases, fructose 1, 6-bisphosphatase (+17%) and glucose-6-phosphatase (+22%). Liver lactate dehydrogenase, malate dehydrogenase, glucose-6-phosphatase and fructose 1, 6-bisphosphatase activities were also enhanced. However, the activities of glucose-6-phosphate dehydrogenase and malic enzyme fell significantly in the intestine but increased in liver. Although the activities of alkaline phosphatase, gamma-glutamyl transpeptidase and sucrase decreased in mucosal homogenates and brush border membrane, those of liver alkaline phosphatase, gamma-glutamyl transpeptidase and leucine aminopeptidase significantly increased. These changes were due to a respective decrease and increase of the maximal velocities of the enzyme reactions. Ramadan-type fasting caused similar effects whether the rats fasted with a daytime or night-time feeding schedule. The present results show a tremendous adaptation capacity of both liver and intestinal metabolic activities with Ramadan-type fasting in rats used as a model for Ramadan fasting in people.

In a study done on chronic liver disease patients,[22] the non-fasting group showed significant good adherence to therapy (43.4%) compared to (27.2%) the fasting group (p=0.016). Dyspeptic symptoms were higher in the fasting (53.4%) compared to (38.4%) the non-fasting group (p=0.032). G.I. bleeding during Ramadan was higher in the fasting group (17.5%) compared to non-fasting (14.1%), but the bleeding due to esophageal varices was significantly higher in the non-fasting group (9.1%) compared to (1%) the fasting group (p=0.004). Fasting chronic hepatitis group showed non-significant changes in the liver functions during and after Ramadan. However, 13% of fasting cirrhotic patients tripped into Child class C during Ramadan and 32.6% after Ramadan.

Miscellaneous

Long-term hunger and the changes in the nutritional routines during Ramadan did not constitute any risk factors for acute appendicitis.[23] Findings on the increase in primary small bowel volvulus, mesenteric ischaemia, and hyperemesis gravidarum, and the decrease in idiopathic intussusception remain to be investigated more, before a definitive conclusion can be made.[24]

Conclusion

Millions of Muslims participate in the fast of Ramadan each year. There is an increase in the gastroesophageal reflux related symptoms and peptic ulcer disease, which can be adequately looked after by the use of proton pump inhibitors. Some patients with advanced chronic liver disease may decompensate if they fast. As gastrointestinal problems tend to be more common and severe in diabetics compared with the nondiabetic population, diabetic fasting patients need to observe extra precautions during fasting which will help them to have a comfortable Ramadan.

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