

Effects of Ramadan Fasting on Common Upper Gastrointestinal Disorders; A Review of the Literature

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ABSTRACT

Introduction: Ramadan is the ninth month of Muslim's calendar during which Muslims fast. Ramadan lasts 29-30 days based on the visual sightings of the crescent moon. Fasting during Ramadan has significant health effects. The present study aimed at reviewing the literature of the impact of Ramadan fasting on upper gastrointestinal disorders.

Methods: MEDLINE and Google Scholar were searched by using (("Ramadan" R fasting") AND("Upper Gastrointestinal Tract" OR "Gastrointestinal Diseases" OR "Dyspepsia" OR "Gastroesophageal Reflux" OR "Peptic Ulcer" OR "Gastrointestinal Hemorrhage")) as keywords in the title and abstract. Relevant, non- duplicate full articles written in English were reviewed.

Results: Gastric acid and pepsin secretion increase during Ramadan fasting, probably associated with dyspeptic symptoms. Regarding peptic ulcer frequency, results are inconsistent. However, peptic ulcer complications such as gastrointestinal bleeding and peptic ulcer perforation increase during Ramadan fasting.

Conclusion: Fasting during Ramadan seems to be beneficial for healthy individuals, but in people with gastrointestinal disorders, it might be harmful as it increases the risk of complications. Therefore, taking medical advice before Ramadan fasting is highly recommended to people suffering from gastrointestinal symptoms.

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Introduction

Fasting during Ramadan is one of the five holy religious pillars among Muslims and an important annual ritual practiced by them worldwide (1, 2). The month lasts 29-30 days and the duration of fasting is 8 to 18 hours in different seasons and based on the geographical locations (3, 4). While fasting from dawn till sunset, Muslims refrain from eating food, drinking and smoking (5). Fasting is a type of calorie restriction. Fasters consume two meals, one before dawn (namely, Sahar) and one after the sunset (namely, Iftar) during Ramadan fasting (6, 7).

Ramadan fasting has proved significant health effects and as indicated by the literature, it is the most commonly researched religious fasting (8). Fasting during Ramadan may affect body metabolism and human

behavior (9). In addition, eating, sleeping and drug programs changes can affect the control of medical conditions (10, 11). Moreover, fasting and calorie restriction, the most robust intervention to improve various diseases, decrease oxidative stress and the consequent damages (12). The increase of oxidative stress is mainly considered as the main reason behind numerous diseases, resulting from the production of reactive oxygen species (ROS) during respiration (12).

As evident in the literature, different researches have been conducted to assess the impact of Ramadan fasting on gastrointestinal tract. Gastrointestinal disorders can be accelerated or aggravated by prolonged fasting. Findings are indicative of different results in this

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regard; therefore, no consensus exists regarding how upper gastrointestinal tract might be affected by fasting in Ramadan. The present review investigated previous studies on the impact of Ramadan fasting on upper gastrointestinal disorders.

Material and methods

MEDLINE and Google Scholar were searched by using (("Ramadan" OR "fasting") AND ("Upper Gastrointestinal Tract" OR "Gastrointestinal Diseases" OR "Dyspepsia" OR "Gastroesophageal Reflux" OR "Peptic Ulcer" OR "Gastrointestinal Hemorrhage")) as keywords in the title and abstract. After screening for duplicates, potentially relevant articles were chosen and references were hand searched for additional relevant studies that may have been missed using electronic search. Two investigators reviewed articles separately for the selection criteria. The selection criteria were: articles published in full manuscripts in English that examined the relationship between Ramadan fasting and gastrointestinal signs or symptoms and also GI disorders in human. The two reviewers extracted

data. A summary of this data is presented in Table 1.

Results and discussions

Dyspepsia

Dyspepsia is an upper GI tract syndrome associated with epigastric discomfort, fullness sensation, early satiety, nausea, vomiting, and belching(13). Recent studies have reported a high prevalence of dyspepsia worldwide. The prevalence of dyspepsia was identified about 30% in Iran.(14). In a cross-sectional study by Keshteli et al. (2015), no significant relationship was found between fasting and the frequency or severity of dyspeptic symptoms (15). Although another study by Torab et al. (2009) reported that patients with dyspeptic symptoms and history of peptic ulcer disease were at higher risk of peptic ulcer perforation associated with fasting, they should also be considered for prophylactic treatment before Ramadan(16).

Gastro-Esophageal Reflux Disease

As indicated by the results of some recent

Table 1. Ramadan fasting and common gastrointestinal disorders relationship

	First Author	Design	Number of Participants	Settings	Findings
1	Keshteli AH(15)	Cross-sectional	900	Healthy fasting adults	Ramadan fasting does not increase the frequency and severity of common gastrointestinal symptoms in general population except for constipation.
2	Torab FC(16)	Cross-sectional	117	Patients admitted with PPU	A significantly increased risk of perforation was evident during the daytime fasting month of Ramadan.
3	Iraki L(17)	Cross-sectional	9	Healthy volunteers	Gastric acid increased during Ramadan mainly in diurnal phase
4	Hakkou F(19)	Cross-sectional	13	Healthy volunteers	Gastric acid and pepsin secretion increases during Ramadan.
5	Bener A(20)	Cross-sectional	470	PUD patients	PUD and PUP was more frequent in the month after Ramadan
6	Al- Kaabi(21)	Cross-sectional	516	PUD patients	PUD incidence didn't increase during Ramadan
7	Gokakin AK(22)	Cross-sectional	321	Patients undergoing UGI endoscopy	Duodenal ulcers and duodenitis were found more frequent during Ramadan
8	Hosseini- Asl K(23)	Cohort	39	PUD patients on drug regimen	Fasting didn't have any deteriorating effect on duodenal ulcer healing
9	Donderici O(24)	Cross-sectional	1114	Patients with PUD complications	PUD complications increased during Ramadan fasting
10	Ozkan S(25)	Cross-sectional	71	AUGIB patients	AUGIB diagnosis is more common during Ramadan
11	Amine M(26)	Cross-sectional	291	AUGIB undergoing endoscopy	Overall number of patients increased during Ramadan. PUD was the most common etiology.
12	Emami MH(27)	Cohort	236	AUGIB patients	Deudonal ulcer was more common in fasting group
13	Golkakin AK(29)	Retrospective cohort	229	Patients operated for PU	PUP is detected as relatively higher during Ramadan while fasting more than 12 hour

studies, Gastro-esophageal Reflux disease is higher during Ramadan fasting (17, 18). The reason could be due to eating too fast without chewing or chewing with mouth open, smoking at Iftar and Sahar, drinking too much of carbonated and caffeinated beverages, such as cola, coffee and tea and eating fatty and spicy food (19).

Peptic Ulcer Disease

Peptic ulcer disease (PUD) is a GI tract disorder characterized by mucosal damage secondary to pepsin and gastric acid secretion occurring in stomach and proximal duodenum(17). One study showed that Ramadan induces an increase of both gastric acid and pepsin secretion, though this effect got reversed when Ramadan ended (19). Another study by Iraki et al. measured the 24-h gastric PH during Ramadan and observed an increase of gastric acidity mainly in diurnal phase (8AM-5PM) (18). These gastric secretion changes are likely associated with the increase of dyspeptic symptoms during Ramadan (19).

Regarding the frequency of PUD, two studies reported no increase during Ramadan fasting (20, 21), and one of these studies declared that the frequency of PUD and its complications increased after Ramadan (20). On the other hand, another study evaluating patients with epigastric pain and referring for endoscopy before, during and after Ramadan observed that duodenal ulcers and duodenitis were found more often during Ramadan (22). A clinical study was performed by Hosseini- Asl to assess the healing process of peptic ulcer in patients on proton pump inhibitor drugs during Ramadan. They found that fasting does not have a deteriorating effect on healing of duodenal ulcer, and even if there is an active duodenal ulcer, one can fast while taking the drug regimen (23).

Acute Upper Gastrointestinal Bleeding (AUGIB)

Around 25 percent of patients with PUD experience some serious complications such as hemorrhage, perforation, or gastric outlet obstruction (17). Donderici et al, in a retrospective study, found that peptic ulcer complications were in all years higher during Ramadan than before or after Ramadan (24). Regarding acute upper gastrointestinal hemorrhage (AUGIH), it was found that the number of patients with AUGIH was significantly higher in Ramadan than other months, and the peptic ulcer disease was

recognized as its main cause (25). A retrospective analysis on patients undergoing AUGIB endoscopy in Ramadan and the month before demonstrated that there were more patients admitted for AUGIB in Ramadan, especially more duodenal ulcer bleeding. Furthermore, regarding patients' outcome, there was no significant difference between the two groups, which recommends that Ramadan fasting may not influence the prognosis of AUGIB (26). Similar results were obtained in another study conducted in Iran as well. They concluded that Ramadan fasting increases AUGIB due to duodenal ulcer, but it does not make the prognosis poorer (27).

Ulcer perforation as a serious complication of PUD occurs in approximately 2- 10 percent of peptic ulcers (28). A Turkish study demonstrated that significantly more peptic ulcer perforation (PUP) surgeries happened during Ramadan than other months. Also, duration of fasting influenced the prevalence of PUP, as people fasting more than 12 hours significantly had more PUP in this study (29). Similar results were obtained from another study showing that the incidence of PUP is at the lowest rate in non-winter days with no fasting while it increases in winter days with no fasting (with a relative risk of 2.62), and this is even higher in fasting days during winter (16). Although some studies indicated that Ramadan fasting increases PUP, a Saudi study showed no change in the prevalence of PUP during Ramadan (30).

Conclusion

In this systematic review, it was found that Ramadan fasting seems to be harmless in healthy individuals, but in people with gastrointestinal disorders, it might be harmful as it increases the risk of complications.

Although findings about the effect of Ramadan fasting on dyspeptic symptoms are inconsistent (15, 16), as PUD complications like AUGIB and PUP are more commonly reported during Ramadan than other months (16, 25-27, 29), taking special considerations is recommended for people with history of PUD (16).

References

1. Miller T. Mapping the global Muslim population: a report on the size and distribution of the world's Muslim population. Washington, DC: Pew Research Center; 2009.

2. Leiper J, Molla AM. Effects on health of fluid restriction during fasting in Ramadan. *Eur J Clin Nutr.* 2003; 57(Suppl 2):S30-8.
3. Göçmen E, Koç M, Tez M, Yoldaş Ö, Bilgin A, Keşkek M. Effect of Ramadan on surgical emergencies. *Ann Emerg Med.* 2004; 44(3):283-5.
4. Azizi F. Islamic fasting and health. *Ann Nutr Metab.* 2010; 56(4):273-82.
5. Barkia A, Mohamed K, Smaoui M, Zouari N, Hammami M, Nasri M. Change of diet, plasma lipids, lipoproteins, and fatty acids during Ramadan: a controversial association of the considered Ramadan model with atherosclerosis risk. *J Health Popul Nutr.* 2011; 29(5):486-93.
6. Gharbi M, Akrouf M, Zouari B. Food intake during and outside Ramadan. *East Mediterr Health J.* 2003; 9(1-2):131-40.
7. Roky R, Chapotot F, Hakkou F, Bencheikroun MT, Buguet A. Sleep during Ramadan intermittent fasting. *J Sleep Res.* 2001; 10(4):319-27.
8. Trepanowski JF, Canale RE, Marshall KE, Kabir MM, Bloomer RJ. Impact of caloric and dietary restriction regimens on markers of health and longevity in humans and animals: a summary of available findings. *Nutr J.* 2011; 10(1):107.
9. Larjani B, Zahedi F, Sanjari M, Amini MR, Jalili RB, Adibi H, et al. The effect of Ramadan fasting on fasting serum glucose in healthy adults. *Med J Malaysia.* 2003; 58(5):678-80.
10. Salti I, Bénard E, Detournay B, Bianchi-Biscay M, Le Brigand C, Voinet C, et al. A population-based study of diabetes and its characteristics during the fasting month of Ramadan in 13 countries results of the epidemiology of diabetes and Ramadan 1422/2001 (EPIDIAR) study. *Diabetes Care.* 2004; 27(10):2306-11.
11. Ural E, Kozdag G, Kilic T, Ural D, Şahin T, Celebi O, et al. The effect of Ramadan fasting on ambulatory blood pressure in hypertensive patients using combination drug therapy. *J Hum Hypertens.* 2008; 22(3):208-10.
12. Balaban RS, Nemoto S, Finkel T. Mitochondria, oxidants, and aging. *Cell.* 2005; 120(4):483-95.
13. Talley NJ, Phung N, Kalantar JS. ABC of the upper gastrointestinal tract: Indigestion: When is it functional? *BMJ.* 2001; 323(7324):1294-7.
14. Amini E, Keshteli AH, Jazi MS, Jahangiri P, Adibi P. Dyspepsia in Iran: SEPAHAN Systematic Review No. 3. *Int J Prev Med.* 2012; 3(Suppl 1):S18-25.
15. Keshteli AH, Sadeghpour S, Feizi A, Boyce P, Adibi P. Evaluation of self-perceived changes in gastrointestinal symptoms during Ramadan fasting. *J Relig Health.* 2015; 24:1-8.
16. Torab FC, Amer M, Abu-Zidan FM, Branicki FJ. Perforated peptic ulcer: different ethnic, climatic and fasting risk factors for morbidity in Al-ain medical district, United Arab Emirates. *Asian J Surg.* 2009; 32(2):95-101.
17. Ramakrishnan K, Salinas RC. Peptic ulcer disease. *Am Fam Physician.* 2007; 76(7):1005-12.
18. Iraki L, Abkari A, Vallot T, Amrani N, Khelifa RH, Jellouli K, et al. Effect of Ramadan fasting on intragastric pH recorded during 24 hours in healthy subjects. *Gastroenterol Clin Biol.* 1997; 21(11):813-9.
19. Hakkou F, Tazi A, Iraqui L, Celice-Pingaud C, Vatie J. The observance of Ramadan and its repercussion on gastric secretion. *Gastroenterol Clin Biol.* 1993; 18(3):190-4.
20. Bener A, Derbala MF, Al-Kaabi S, Taryam LO, Al-Ameri MM, Al-Muraikhi NM, et al. Frequency of peptic ulcer disease during and after Ramadan in a United Arab Emirates hospital. *East Mediterr Health J.* 2006; 12(1-2):105-11.
21. Al-Kaabi S, Bener A, Butt MT, Taweel M, Samson S, Al-Mosalamani Y, et al. Effect of Ramadan fasting on peptic ulcer disease. *Indian J Gastroenterol* 2004; 23(1):35.
22. Gokakin AK, Kurt A, Akgol G, Karakus BC, Atabey M, Koyuncu A, et al. Effects of Ramadan fasting on peptic ulcer disease as diagnosed by upper gastrointestinal endoscopy. *Arab J Gastroenterol.* 2012; 13(4):180-3.
23. Hosseini-Asl K, Rafieian-Kopaei M. Can patients with active duodenal ulcer fast Ramadan? *Am J Gastroenterol.* 2002; 97(9):2471-2.
24. Dönderici O, Temizhan A, Küçükbaş T, Eskioglu E. Effect of Ramadan on peptic ulcer complications. *Scand J Gastroenterol.* 1994; 29(7):603-6.
25. Ozkan S, Durukan P, Akdur O, Vardar A, Torun E, İkizceli I. Does Ramadan fasting increase acute upper gastrointestinal haemorrhage? *J Int Med Rese.* 2009; 37(6):1988-93.
26. Amine el M, Kaoutar S, Ihssane M, Adil I, Dafr-Allah B. Effect of Ramadan fasting on acute upper gastrointestinal bleeding. *J Res Med Sci.* 2013; 18(3):230-3.
27. Emami MH, Rahimi H. Effects of Ramadan fasting on acute upper gastrointestinal bleeding due to peptic ulcer. *J Res Med Sci.* 2006; 11(3):170-5.
28. Behrman SW. Management of complicated peptic ulcer disease. *Arch Surg.* 2005; 140(2):201-8.
29. Gokakin AK, Kurt A, Atabey M, Koyuncu A, Topcu O, Aydin C, et al. The impact of Ramadan on peptic ulcer perforation. *Ulus Trauma Acil Cerrahi Derg.* 2012; 18(4):339-43.
30. Jastaniah S, Al Naami MY, Malatani TM. Perforated duodenal ulcer in Asir central hospital. *Saudi J Gastroenterol.* 1997; 3(2):90-3.