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Original Article

Effects of Ramadan fasting on acute upper gastrointestinal bleeding due to peptic ulcer

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Abstract

BACKGROUND: As, acid negatively affects duodenal and gastric mucosal defense, we designed this study to investigate if fasting during Ramadan can promote peptic ulcer and its complication, acute upper gastrointestinal bleeding.

METHODS: All patients files who had admitted to hospital with acute upper gastrointestinal bleeding from 10th day of Ramadan till one month later, in 2002 to 2004 were reviewed. Patients were divided into two groups: fasting group who were fasting, at least 10 days before admission and non-fasting group.

RESULTS: A total of 236 patients were included in the study; fasting group involved 108 subjects and non-fasting group 128 ones. Both groups were matched regarding sex, predisposing factors and underlying diseases. Fasting group showed more frequent duodenal ulcer (38%) compared to non-fasting group (19.5%) (P = 0.002). The frequency of esophageal varices was significantly higher in non-fasting group. There was no correlation between fasting and other causes of gastrointestinal bleeding. In fasting group 38%, and in non-fasting group 18.9%, had previous dyspeptic symptoms (P = 0.001). Two groups were similar regarding prognostic factors.

CONCLUSION: It seems Ramadan fasting can increase acute upper gastrointestinal bleeding due to duodenal ulcer, but it does not make its prognosis poorer than that in non-fasting patients. Dyspeptic symptoms could be considered as alarming signs for patients who want to fast during Ramadan.

KEYWORDS: Ramadan, fasting, acute upper gastrointestinal bleeding, duodenal ulcer.

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Muslims fast from dawn to sunset during Ramadan (the ninth lunar month in Hegira calendar) and it is obligatory for all healthy adults to fast [1]. Over 50% of muslims fast every day or on some days of Ramadan and some of them can not fast due to medical problems forbidding fasting [2].

Three major causes of upper GI bleeding are peptic ulcer disease (PUD), gastric erosion and esophageal varices. PUD includes duodenal, gastric and stomal ulcers account for about 50% of upper GI bleeding episodes [3]. Acid is still an independent factor that, negatively, affects mucosal defense and plays an important role in the pathogenesis of PUD, especially, duodenal ulcer [4]. Roles of gastric secretion, motility, and mucosal abnormalities as primary pathogenic elements in ulcer development have also been noted [4]. Factors that can cause bleeding or rebleeding from peptic ulcer include H. Pylori, NSAIDS and gastric acidity [5-7].

During Ramadan, gastrin, pepsin and acid secretions increase and then, will return to pre-Ramadan level one month later [8-10]. It is indicated that the median pH is 2.3 prior to Ramadan, 1 at day 10 and day 24 of Ramadan and 1.6 one month later [10]. The gastric acid secretion is increased by 45% at day 10 of Ramadan

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compared with its level prior to Ramadan and the diurnal increase is much more than the nocturnal one (122% and 25%, respectively) [10]. The gastric acid secretion is 23% higher than baseline even one month after Ramadan [10]. These modifications in gastric acid secretion are likely fundamental to the increase of dyspeptic symptoms observed during the Ramadan.

One study showed higher rate of peptic ulcer complications during Ramadan compared with the same period before and after it;[11] but fasting had no influence on the outcome of duodenal ulcers treated by lansoprazole, omeperazole or H2-blockers; i.e. healing rate (90% to 95%) was similar in fasting and non-fasting groups [12-14].

In another study, psychological changes especially changes in irritability were increased continuously during Ramadan and reached its peak at the end of the month especially in smokers [15]. More over, during Ramadan fasting, medication intake compliance decreases; therefore it may worsen or relapse underling disease such as PUD in fasting patients. Also in rats, fasting less than 24 hours causes no ulceration in stomach, but starvation (for 5 days) increases the number of mucosal ulcerations and aggravated acid-induced gastric erosions [16-19]. Finally, Ramadan fasting increases bleeding and coagulation time and causes in vitro decrease in the platelet responses of different aggregating agents (ADP, adrenaline and collagen) [20].

On the other hand, during Ramadan fasting, smoking and drinking alcohol which are risk factors of PUD and Mallory-Weiss syndrome are prohibited. Although, the overall estimation was an increment of AUGIB due to PUD with Ramadan fasting, there might be some other psycho-socio-environmento-spiritual factors that could affect the final outcome.

Does Ramadan actually increase the rate of AUGIB or not? The question was investigated in this study.

Methods

In a historical cohort study, all patients who had admitted to Alzahra hospital, Isfahan, Iran with AUGIB during a 3-month period (Ramadan month, one month before and one month later) for 3 consecutive years (2002 to 2004) were enrolled in the study. Approximately all patients were admitted during autumn season except the month before Ramadan of 2004 which included the last 15 days of September too. Alzahra is the only referral hospital of Isfahan province during the past 8 years for the management of AUGIB and emergency endoscopy. All patients files with AUGIB from the 10th day of Ramadan month to one month after it from 2002 to 2004 were reviewed and filled out the required information including the prognostic factors in a data sheet, designed for this purpose. Prognostic factors that affect outcome of AUGIB include, the cause of bleeding (most important), severity of the initial bleeding that is assessed by the transfusion requirement, age of the patient, concomitant diseases, onset of bleeding during hospitalization, emergency surgery, medical and conservative therapies and therapeutic endoscopic techniques [21-26].

The gathered information included age, sex, recent use of NSAIDS, recent use of anticoagulants, past history of smoking, underlying diseases, frequency distribution of causes of AUGIB (table 3), previous dyspeptic symptoms (epigastric pain and fullness, heart burn, nausea, early satiety and bloating), prognostic factors and outcome of AUGIB (re-bleeding, need to surgery, volume of infused packed cells, number of days in hospital and mortality rate). Then, they were contacted and questioned about their fasting status from one month before AUGI and, the number of fasting days.

For analytical purposes, the patients were divided into fasting group who were fasting, at least 10 days before admission and non-fasting group. The data were analyzed by SPSS software, using t-test, Chi-square and Mann-Whitney tests. Data expressed as mean ± SD,

unless stated otherwise. P values less than 0.05 were statistically considered significant.

Results

Of patients with AUGIB (245 patients) from the 10th day of Ramadan to one month after from 2002 to 2004, we could contact 238 patients; 108 patients had been fasting at least 10 days (46%) and 128 patients had not been fasting any days (54%). Two patients had been fasting less than 10 days and they were eliminated from the study.

In fasting group, mean days of fasting was 20. They were 16-96 years old and their mean age was 48 ± 19 years; 70 males (64.8%) and 38 females (35.2%). Non-fasting group were 17-91 years with the mean age of 57 ± 19 years; 96 males (75%) and 32 females (25%).

Patients in fasting group were younger than non-fasting group (P<0.05) (table 2). Both groups were comparable regarding male/ female ratio, predisposing factors for GI bleeding (recent consumption of NSAIDs and anticoagulants and smoking) and previous underlying diseases that may promote GI bleeding (peptic ulcer disease, cirrhosis, CRF, COPD and coagulopathy) (table 2).

There was not any significant difference between two groups in AUGIB whether in Ramadan or one month later but, the number of non-fasting patients with AUGIB was significantly higher than fasting patients in the month before Ramadan (table 1). Frequency of duodenal ulcer in fasting group (38%) was significantly more than that in non-fasting group (19.5%), which was significant only for 20-60 years old patients (P<0.05), and not for others. Conversely, the frequency of esophageal varices in non-fasting group (11.7%) was more than that in fasting group (3.7%) (P<0.05), which was significant for patients more than 40 years old (P<0.05). The frequency of other causes of AUGIB but erosive gastritis, in fasting group, was less than that in non-fasting group but, this difference was not significant (table 3). Gastric ulcer and erosive gastritis more frequently occurred in patients more than 60 years old in non-fasting group (P<0.05).

Fasting group showed more dyspeptic symptoms (38%) compared with non-fasting group (18.9%); (P = 0.001 and odds ratio = 2.62).

Regarding the outcome of AUGIB in both groups, there was no significant difference between them from the points of rebleeding in hospital, need to surgery, volume of infused packed cells and number of days in hospital (NS). But mortality rate was higher in non-fasting group (12.5%/3.7%) (table 4).

Table 1. The frequency of acute upper gastrointestinal bleeding in Ramadan.

Month→ Year↓	One month before Ramadan NF/F(n)	Month of Ramadan NF/F(n)	One month after Ramadan NF/F(n)
2002	59/0	28 (18)	29 (11)
2003	55/1	42 (30)	37 (18)
2004	68/1	43 (22)	35 (9)
Sum	182/2	113 (70)	101 (38)

NF/F (n); number of non-fasting group/fasting group

Table 2. Frequency of predisposing factors and underlying diseases of acute upper gastrointestinal bleeding in fasting and non-fasting groups.

Factor	Fasting group	Non-fasting group	P-value
Mean age (year)	48	57	0.001
Sex (male%/female%)	64.8/35.2	75/25	0.088
Recent use of NSAIDs (%)	21.3	28.1	0.227
Recent use of anticoagulant Drugs (%)	2.8	4.7	0.445
Previous smoking (%)	22.2	33.6	0.54
Underlying diseases (%)	17	28	0.861

Table 3. Frequency of the causes of acute upper gastrointestinal bleeding in

fasting and non-fasting groups.

	Fasting group	Non-fasting group	P-value	Odds ratio
Duodenal ulcer (%)	38%	19.5%	0.002	2.52
Erosive gastritis(%)	17.6%	16.4%	0.809	1.09
Gastric ulcer (%)	13%	18%	0.292	0.68
Esophageal varices (%)	3.7%	11.7%	0.024	0.29
Mallory-Weiss (%)	2.8%	3.1%	0.876	0.886
Other causes (%)	12%	18%	0.207	0.625
Obscure AUGIB (%)	13%	13.3%	0.943	0.972
All above causes but duodenal ulcer and and erosive gastritis	44.4%	64.1%	0.543	0.449

Table 4. Outcome of acute upper gastrointestinal bleeding in fasting and non-fasting groups.

	Fasting group	Non-fasting group	P-value
rebleeding in hospital (%)	12%	14.1%	0.646
need to surgery (%)	8.3%	7.8%	0.884
mean volume infused packed cells (ml)	964.6	965.9	0.991
mean number of days in hospital (days)	4.68	4.81	0.954
mortality (%)	3.7%	12.5%	0.016

Discussion

It is observed that AUGIB has seasonal fluctuation with low prevalence in winter and an increase in spring and autumn with two peaks in April and October [27]. The seasonal prevalence parallels that of duodenal ulcer bleeding, which follows a similar fluctuation [27]. Approximately all of our patients were studied at autumn but one month before Ramadan from 2002 to 2004 was nearly within October. GI-bleeding due to DU was increased during Ramadan in our study, and more frequent dyspeptic symptoms in fasting group could be considered as alarm signs for patients who want to fast during Ramadan.

On the other hand, the frequency of GI-bleeding because of almost all other causes was decreased; this decrement was significant only in bleeding due to esophageal varices. Less frequent esophageal varices in fasting group could be explained by decrement in portal pressure during fasting. Patients with portal hypertension have very high azygos blood flow in comparison with healthy controls [28]. Eating significantly increases azygos blood flow both in controls (38%) and in cirrhotics (27%) [29, 30]. Therefore, compared with fasting conditions, regular food intake plays probably an important role in the maintenance of effective hepatic blood flow in cirrhotic patients [31] It seems therefore that fasting can decrease episodes of AUGIB due to esophageal varices.

Fasting group were younger than non-fasting group. This is obvious that older age group do not fast because of other concomitant diseases and disabilities that they have or because they take drugs. As mentioned above, duodenal ulcer was more common in fasting group and it occurred in younger patients while other causes of GI bleeding were more common in older patients.

Both fasting and non-fasting groups were similar regarding prognostic factors but, lower mortality rate in fasting group might be due to their younger age compared with non-fasting group. Mortality rates because of upper GI hemorrhage vary from 3.5% to 7% in the United States [23, 26, 32], and 14% in the United Kingdom [33].

Conclusion

Ramadan fasting can increase AUGIB by aggravating duodenal ulcer, but it does not make its prognosis poorer than non-fasting patients. Dyspeptic symptoms could be considered as

alarming signs for patients who want to fast during Ramadan. Therefore, we recommend caution in advising fasting to those with previous history of DU and dyspepsia, except with concurrent prescription of proton pump inhibitors as prophylaxis. Further evaluation of the effects of prophylactic drugs such as H2-blockers and proton pump inhibitors and Helicobacter eradication in preventing AUGIB due to duodenal ulcer should be done.

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