# Frequency of peptic ulcer disease during and after Ramadan in a United Arab Emirates hospital

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**تواتر الإصابة بمرض القرحة الهضمية أثناء شهر رمضان وبعده، في مستشفى بالإمارات العربية المتحدة**

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**الخلاصة:** استهدف الباحثون دراسة تأثير صيام شهر رمضان على معدل وقوع مرض القرحة الهضمية ومضاعفاته في المرضى المُراجعين لقسم الحوادث والطوارئ بمستشفى العين، بدولة الإمارات العربية المتحدة. وقام الباحثون بمراجعة استعادية لسجلات المرضى لفترة 10 سنوات من عام 1992 إلى عام 2002. وبيَّنت الدراسة أنه من بين 470 مريضاً عولجوا من مرض القرحة الهضمية، شُوهد 215 منهم أثناء شهر رمضان، وشُوهد 255 منهم في الشهر التالي لرمضان. ولوحظ أن تواتُر وقوع مرض القرحة الهضمية قد ازداد بعد رمضان، ولكنها زيادة لا يُعْتَدُّ بها إحصائياً. وكان معظم المرضى قبل رمضان وبعده من الذكور ومن جنسيات غير إماراتية. وتركز وقوع المرض في الفئة العمرية 30–49 عاماً. كما تَوَاتَرَ حدوث انثقاب القرحة الهضمية بعد رمضان، ولكن بنسبة لا يُعْتَدُّ بها إحصائياً. وقد حدَّد تحليل التحوُّف المتغيرات التالية على أنها عوامل منبِّئة بوقوع مرض القرحة الهضمية: فقدان الشهية، الألم، فرط ضغط الدم، التدخين، الآلام الشرسوفية، السكَّري، والسوابق المرضية للأسرة.

ABSTRACT We aimed to study the effect of Ramadan fasting on the occurrence of peptic ulcer disease and its complications in patients presenting to the Accident and Emergency Department at Al-Ain hospital, United Arab Emirates (UAE). We retrospectively reviewed patient records over the 10-year period, 1992 to 2002. Of 470 patients treated for peptic ulcer disease, 215 were seen during Ramadan and 255 in the month after Ramadan. The frequency of peptic ulcer disease was higher after Ramadan than during Ramadan but this was not statistically significant. Peptic ulcer disease occurred more frequently in the age group 30–49 years. Peptic ulcer perforation occurred 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.

**Fréquence de la maladie ulcéreuse gastro-duodénale pendant et après le ramadan dans un hôpital des Émirats arabes unis**

RÉSUMÉ Notre objectif était d'étudier l'effet du jeûne du ramadan sur la survenue de la maladie ulcéreuse gastro-duodénale et ses complications chez des patients se présentant au Service des Urgences de l'Hôpital d'Al Ain (Émirats arabes unis). Nous avons effectué une étude rétrospective des dossiers des patients sur une période de 10 ans, de 1992 à 2002. Sur les 407 patients traités pour un ulcère gastro-duodénal, 215 avaient consulté pendant le ramadan et 255 durant le mois suivant. La fréquence de la maladie ulcéreuse gastro-duodénale était plus élevée après le ramadan que pendant mais ce n'était pas statistiquement significatif. La maladie ulcéreuse gastro-duodénale survenait plus fréquemment dans le groupe d'âge 30-49 ans. La perforation d'ulcère gastro-duodénal était plus fréquente après le ramadan mais la différence n'était pas significative. L'analyse de régression a permis d'identifier les variables suivantes comme facteurs prédictifs de la maladie ulcéreuse gastro-duodénale : anorexie, douleur, hypertension, tabagisme, douleurs épigastriques, diabète et antécédents familiaux.

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## Introduction

Sustained fasting over a period of time is or has been a feature of several of the world's major religions. For Islam, the whole of the holy month of Ramadan is a time of strictly observed fasting during the daylight hours. Globally, nearly 1 billion Muslims fast during this month.

During Ramadan, all healthy adult Muslims are obliged to abstain from eating and drinking from sunrise to sunset. They must also abstain from taking oral medications as well as intravenous fluids and nutrients [*1,2*]. During night hours of Ramadan, eating and drinking tend to increase [*1,4*]. This pattern of intermittent eating and fasting is different from other types of fasting or ongoing food deprivation [*5*]. To date only a few studies on the physiological effects of altered activity and eating schedule associated with Ramadan fasting have been reported, such as decreased daytime oral temperature, alertness, mood, reduced physical activity and concentration [*2,3,6,7*].

The mortality from peptic ulcer bleeding has not changed materially in recent years and remains at 7%–10% despite advances in patient management [*8*]. Perforated peptic ulcer is a serious complication of peptic ulcer disease [*9,10*].

The objective of this study was to investigate whether fasting in the month of Ramadan had any effect on the peptic ulcer frequency and peptic ulcer perforation in Muslim patients presenting to the Accident and Emergency Department of a large hospital in the United Arab Emirates.

## Methods

We conducted a retrospective descriptive study of peptic ulcer perforation among patients presenting to the Accident and Emergency Department of Al Ain Hospital in the United Arab Emirates who were then treated at the Departments of Medicine and Surgery. The study period was the month of Ramadan and the month after Ramadan (*Shawwal*) in the Hijrah calendar for the period 1992–2002. The information gathered included data on sociodemographic characteristics of the patients (age, sex, nationality). Other information collected included lifestyle habits of eating, drinking, cigarette smoking, perforation, history of previous gastrointestinal diseases and history of medication. Data were extracted from the medical records; records with incomplete or missing data were excluded from the study. Only cases of peptic ulcer with pathologic conditions leading to peptic ulcer complication such as haemorrhage and perforation were included; thus cases of oesophageal varices or cancer of the stomach were excluded. Patients with perforation of peptic ulcer that occurred outside the 2 months of study were excluded.

The data were analysed using *SPSS*, version 11. Data are expressed as mean and standard deviation (SD) unless otherwise stated. Chi-squared analysis was performed to test for differences in proportions of categorical variables between 2 or more groups. In 2 × 2 tables, the Fisher exact test (two-tailed) was used instead of the chi-squared test when the sample size was small. Stepwise logistic regression analysis was used to adjust for potential confounders and to rank the risk factors (determinants) for peptic ulcer and perforation. $P < 0.05$ was considered as the cut-off value for statistical significance.

## Results

Sociodemographic characteristics of patients with peptic ulcer who were admitted at the Accident and Emergency Depart-

ment and treated in the Departments of Medicine and Surgery are shown in Table 1. During the 10-year period, the number of patients with peptic ulcer was higher in the month after Ramadan than during Ramadan (255 versus 215) but the difference was not statistically significant ($P > 0.05$). The frequency of peptic ulcer was highest in patients between 30 and 49 years. Although the frequency of peptic ulcer disease was higher in men both during and after Ramadan, a high proportion of the patients were women in both periods.

There was a greater association between peptic ulcer and hypertension and diabetes in the month after Ramadan than during Ramadan but the difference was not statistically significant. The prevalence of smoking was low in our study sample; however, smoking was reported to be significantly higher after Ramadan (15.0% versus 24.3%, $P = 0.014$).

Some of the characteristics associated with peptic ulcer disease found in our patients are shown in Table 2. Statistically significant higher frequencies were found for the following variables in the month after Ramadan compared with Ramadan: indigestion ($P = 0.022$), anorexia ($P = 0.003$), perforation ($P = 0.008$) and use of medicines ($P = 0.0031$).

Table 1 **Sociodemographic characteristics of peptic ulcer patients during Ramadan and after Ramadan (1992–2002)**

| Variable | During Ramadan (*n* = 215) | | After Ramadan (*n* = 255) | | *P*-value |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| *Sex* | | | | | |
| Male | 114 | 53.0 | 168 | 65.9 | 0.006 |
| Female | 101 | 47.0 | 87 | 34.1 | |
| *Nationality* | | | | | |
| UAE | 87 | 40.5 | 98 | 38.4 | NS |
| Non UAE | 128 | 59.5 | 157 | 61.6 | |
| *Age group (years)* | | | | | |
| <30 | 30 | 14.0 | 84 | 32.9 | < 0.001 |
| 30–39 | 71 | 33.0 | 74 | 29.0 | |
| 40–49 | 58 | 27.0 | 55 | 21.6 | |
| >50 | 56 | 26.0 | 42 | 16.5 | |
| *Smoking habit*[a] | | | | | |
| Yes | 32 | 15.0 | 61 | 24.3 | 0.014 |
| No | 182 | 85.0 | 190 | 75.7 | |
| *Diseases associated with peptic ulcer* | | | | | |
| Hypertension | 11 | 5.1 | 25 | 9.9 | NS |
| Diabetes | 12 | 5.6 | 21 | 8.3 | NS |
| Age (years) [mean (SD)] | 42.1 (13.3) | | 36.1 (14.6) | | < 0.001 |

*SD = standard deviation.*
*NS = not significant.*
*UAE = United Arab Emirates.*
[a]*Data were available for only 214 and 251 patients during and after Ramadan respectively.*

Table 2 **Symptoms associated with peptic ulcer diseases found in the patients during and after Ramadan (1992–2002)**

| Variable | During Ramadan (*n* = 215) | | After Ramadan (*n* = 255) | | *P*-value |
|---|---|---|---|---|---|
| | No. | % | No. | % | |
| *Previous history of peptic ulcer* | | | | | |
| Indigestion/dyspepsia | | | | | |
| Yes | 73 | 34.0 | 114 | 45.0 | 0.022 |
| No | 142 | 66 | 141 | 55.0 | |
| Epigastric pain | | | | | |
| Yes | 178 | 83.8 | 195 | 76.5 | NS |
| No | 37 | 17.2 | 60 | 23.5 | |
| *Pain* | | | | | |
| Sudden | | | | | |
| Yes | 98 | 45.5 | 131 | 51.4 | NS |
| No | 117 | 54.4 | 124 | 48.6 | |
| Gradual | | | | | |
| Yes | 104 | 48.4 | 108 | 42.4 | NS |
| No | 111 | 51.6 | 147 | 57.6 | |
| *Level of pain* | | | | | |
| Mild | 14 | 6.5 | 17 | 6.7 | NS |
| Moderate | 122 | 56.7 | 140 | 54.9 | |
| Severe | 79 | 36.7 | 98 | 38.4 | |
| *Associated symptoms (anorexia)* | | | | | |
| Yes | 151 | 70.2 | 145 | 56.9 | 0.003 |
| No | 64 | 29.8 | 110 | 43.1 | |
| *Perforation* | | | | | |
| Present | 48 | 22.3 | 86 | 33.7 | 0.008 |
| Absent | 167 | 77.7 | 169 | 66.3 | |
| *Medicines used* | | | | | |
| NSAIDS/aspirin | 8 | 3.7 | 22 | 8.6 | |
| Anti-peptic ulcer | 106 | 49.3 | 148 | 58.0 | 0.0031 |
| None | 101 | 47.0 | 85 | 33.3 | |

*NS = not significant.*
*NSAIDS = non-steroidal anti-inflammatory drugs.*

Table 3 shows the results of stepwise logistic regression analysis which illustrates that anorexia, pain, hypertension, smoking, epigastric pain, diabetes and family history were the only significant predictors of peptic ulcer and peptic ulcer perforation after adjusting for age and sex.

Table 3 **Logistic regression analysis to identify predictors of peptic ulcer and peptic ulcer perforation among patients studied**

| Independent variable | Odds ratio | 95% confidence interval | *P*-value |
|---|---|---|---|
| Anorexia | 5.18 | 2.36–11.39 | 0.0001 |
| Pain | 1.54 | 1.43–1.67 | 0.0001 |
| Hypertension | 1.64 | 1.30–2.08 | 0.005 |
| Smoking | 2.00 | 1.20–3.33 | 0.008 |
| Epigastric pain | 2.49 | 1.19–5.18 | 0.015 |
| Diabetes | 5.20 | 1.32–20.5 | 0.018 |
| Family history | 2.55 | 1.15–5.64 | 0.021 |

## Discussion

There is some evidence from Saudi Arabia that there is a reduction in eating frequency during Ramadan, but that each meal is nutritionally denser than meals taken outside of Ramadan [*11,12*].

In spite of previous reports suggesting a reversible increase in acid and pepsin secretion, which may be involved in the increase of dyspeptic symptoms seen during the Ramadan [*2,13*], and changes in lifestyle, which may be associated with an increase of the gastric acidity mainly in the diurnal phase [*14,15*], we did not find an increase in the frequency of peptic ulcer disease during Ramadan. Donderici et al. reported an increase in peptic ulcer complications during Ramadan, particularly among women [*10*]. We did not find this and in fact peptic ulcer disease and complications were more frequent in the month after Ramadan in our study. Our results are in agreement with Abu Farsakh, who reported that male gender is a risk factor for peptic ulcer perforation [*15*]. An increase in frequency of perforation in middle age reflects that age is a risk factor for peptic ulcer perforation [*16*] rather than Ramadan fasting. This may be due to an increase in the incidence of *Helicobacter pylori* infection with age as the incidence of *H. pylori* infection in those over 50 years and 70 years is >50% and >75% respectively, or due to vascular devitalization [*17*].

The coexistence of peptic ulcer and diabetes mellitus is a rare occurrence. The prevalence of peptic ulcer disease in asymptomatic diabetic patients has been reported to be 5.3% to 7.3% in Japan [*18*]. Although the occurrence of dyspepsia was reported to be common in diabetic patients in a Kenyan hospital, endoscopic findings and *H. pylori* status were not significantly different from those of the non-diabetic population [*19*]. However we found diabetes to be a significant predictor of peptic ulcer disease which may reflect the tendency towards increased stomach acidity during the first 5 years of type I diabetes [*18*]. It is reported that in cases of diabetes with peptic ulcer disease, there is moderate intragastric hyperacidity in case of gastric ulcer and pronounced intragastric hyperacidity with duodenal ulcer [*20*]. Also, type 2 diabetic patients showed a significantly lower eradication rate of *H. pylori* infection, which may be due to changes in the microvasculature of the stomach and to frequent antibiotic use as a result of recurrent bacterial infections leading to the development of resistant strains [*21*].

## Conclusion

No significant difference was found in the frequency of peptic ulcer cases in Ramadan when compared to the month after Ramadan, although the occurrence of peptic ulcer perforation was higher after Ramadan.

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