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The Effect of Ramadan Fasting on Biliary System Diseases: A Prospective Analysis of Emergency Department Admissions

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Abstract

Aim: Prolonged fasting impacts chronic diseases. This study aimed to describe the clinical, laboratory, radiological, and disposition characteristics of fasting patients with known biliary system disease who presented to the emergency department during Ramadan.

Materials and Methods: In this prospective descriptive study, we included fasting patients with known biliary diseases who presented to the emergency department during Ramadan with acute right upper quadrant pain, nausea, and/or vomiting. We recorded demographics (age, gender), laboratory parameters, and hospitalization/discharge status. Patients were categorized into four groups based on radiological imaging: normal findings, common bile duct (CBD) dilatation, cholelithiasis, and biliary sludge.

Results: The study included 37 patients. The most frequent pathological finding on radiological imaging was CBD dilatation (27%). Aspartate transaminase levels were significantly higher in females than in males ($p<0.05$). Furthermore, total and direct bilirubin levels were significantly elevated in patients with abnormal imaging findings and in those requiring hospitalization or referral ($p<0.001$). The hospitalization rate was also significantly higher for female patients ($p=0.007$).

Conclusion: Consuming high-calorie meals after prolonged Ramadan fasting may trigger symptomatic exacerbations in patients with biliary tract pathology. Elevated C-reactive protein and bilirubin levels were correlated with disease severity and the need for hospitalization. Patients with a history of biliary disease should consult their physician before fasting. Because the study was descriptive and lacked a control group, no definitive causal relationship can be established.

Keywords: Fasting, biliary system, starvation, Ramadan

Introduction

Intermittent fasting is a dietary approach involving cycles of fasting and non-fasting periods (1). The most common and popular form is the regimen that involves no calorie intake for two-thirds of the day (2). In our country, healthy Muslims practice this dietary pattern as a form of worship during the month of Ramadan. In the Islamic religion, fasting involves abstaining from eating and drinking from dawn until sunset (3). Therefore, fasting for 30 consecutive days during Ramadan can be considered a form of intermittent fasting. Numerous studies have been conducted to examine the course of existing diseases and investigate the changes that occur in people fasting during this month (4-6). Studies investigating the effects of prolonged hunger on human metabolism have focused on the positive effects of fasting on conditions such as obesity, hypertension, cardiovascular diseases, and diabetes (7,8). It has been observed that studies have prioritized issues such as dehydration caused by hunger and thirst, and the consequent renal colic and renal failure (9,10). Upon conducting a detailed literature review, we found a limited number of studies examining the effect of fasting on biliary system diseases (4). It has been reported that prolonged hunger and thirst tend to cause a decreasing trend in liver function enzymes and may trigger cholecystitis (11,12). Since less food is consumed during Ramadan, bile flow slows. This deceleration can cause concentrated bile to crystallize and

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form stones. Prolonged fasting may produce negative outcomes in patients with pre-existing biliary problems (13). This study aimed to describe the clinical, laboratory, radiological, and disposition characteristics of fasting patients with known biliary system disease presenting to the emergency department during Ramadan.

Materials and Methods

This study was conducted prospectively in the emergency department of a tertiary hospital Kafkas University Health Practice and Research Hospital between March 11, 2024, and April 9, 2024. The study was initiated following the approval of the Kafkas Medical Faculty Ethics Committee (decision number: 02, date: 27.02.2024).

Study Design

Patients who were fasting and presented to the emergency department during Ramadan with gastrointestinal complaints, such as acute-onset right upper-quadrant pain were recorded. Among these patients, those who underwent blood parameter analysis and abdominal computed tomography (CT), ultrasonography (USG), or magnetic resonance cholangiopancreatography (MRCP) imaging were selected. Imaging was performed at the discretion of the treating emergency physician based on clinical presentation, symptom severity, and standard institutional protocols for the evaluation of acute right upper quadrant pain. No standardized imaging protocol specific to this study was applied beyond routine emergency department practice. Patients with no pathology in at least one of the imaging methods were classified as "normal"; those with "stones in the gallbladder" were classified as "cholelithiasis"; those with ductal dilatation due to stones were classified as "dilated common bile duct (CBD)"; and those with "biliary sludge" were classified as "biliary sludge." After obtaining informed consent from the patients to participate in the study, the investigators also recorded their age and gender. The results of "1 tube of hemogram and 1 tube of EDTA biochemistry" tests [white blood cell (WBC); liver function tests: alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyl transferase (GGT), lactate dehydrogenase (LDH); and C-reactive protein (CRP)], which are routinely performed in the emergency department, were added to the dataset.

Patient Selection

During the study period, a total of 54 patients who were fasting during Ramadan and presented to the emergency department with acute right upper quadrant pain or related biliary complaints were initially screened. Of these, 17 were excluded: 6 had no documented history of biliary system disease; 4 had missing laboratory data; 4 had no imaging performed during the visit; and 3 met exclusion criteria (1 with active malignancy, 1 on dialysis, 1 who was pregnant). The final analyzed sample consisted of 37 patients (Figure 1).

Inclusion and Exclusion Criteria

Patients with a history of gallstones, bile duct stones, and/or biliary sludge who had not been hospitalized in the last 6 months were selected. For the purposes of this study, "known biliary system disease" was defined as a previously documented diagnosis of cholelithiasis, choledocholithiasis, or biliary sludge, confirmed by prior imaging (USG, CT, or MRCP) or by surgical or procedural history [e.g., previous endoscopic retrograde cholangiopancreatography (ERCP)], and recorded in the patient's medical records or self-reported with supporting documentation. Patients on chronic medication, patients with diabetes or on dialysis, patients with missing blood parameters, patients without CT or USG images, patients with diseases causing non-biliary abdominal pain, patients under 18 years of age, pregnant women, and patients with a history of cancer were excluded from the study.

Statistical Analysis

Sample Size and Statistical Analysis

The G*Power 3.1.7.9 program was used to calculate the study sample size. The minimum sample size was determined to be 27, with the test power set at 0.80, the margin of error (alpha) at 0.05, and the effect size at 0.50. Data obtained in this study were analyzed using IBM SPSS 27.0. Descriptive statistics were calculated to evaluate the data. Normality was tested using the Kolmogorov-Smirnov test. Because the data were not normally distributed, non-parametric tests were used. Descriptive statistics for continuous variables were presented as median (Q1-Q3), minimum, and maximum; distributions of categorical variables were presented as frequencies and percentages (%). Mann-Whitney U and Kruskal-Wallis tests were used to evaluate the differences between groups because of the non-normal distribution of the data. For categorical comparisons, Fisher's exact test or Fisher–Freeman–Halton exact test was applied where expected cell counts were below 5, as the chi-square test may not be appropriate under these conditions. Results were evaluated at a 95% confidence level, and $p<0.05$ was considered statistically significant. Given the multiple comparisons performed across laboratory parameters and patient subgroups, all analyses should be considered exploratory. No formal correction for multiple testing was applied; findings are intended to generate hypotheses for future confirmatory studies rather than to establish definitive statistical inference.

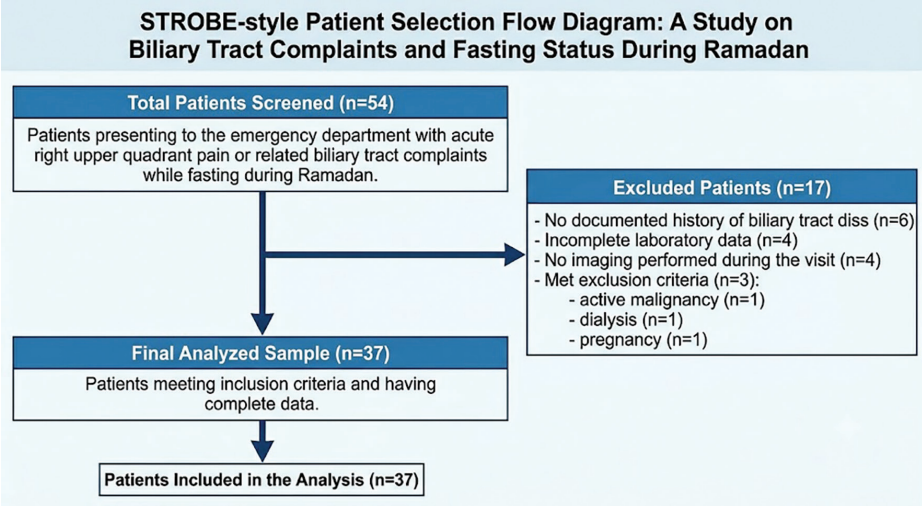

Figure 1. A strobe-style flowchart for patient selection

Results

The study included 37 patients. When descriptive statistics for continuous variables were calculated, the patients' median age was 62 years (Q1-Q3: 47-72), ranging from 28 to 91 years. The median WBC value was 8.80 (6-11.55). The median CRP level was 15 (6.50-58.00), with values ranging from a minimum of 1.00 to a maximum of 181. The median ALT was 30 (21.50-61.50), the median AST was 36 (23.50-67.00), and the median GGT was 63 (35-136), indicating a wide range of values (13-701). The median LDH was 250 (196-400), with a wide range of 150-716. The median value for total bilirubin was 2.40 (1.30-6.90), and for direct bilirubin was 1.30 (0.86-4.40).

The majority of the patients (62.2%) were female. USG/CT/MRCP reports indicated that 48.6% of patients had normal findings, 27% had a dilated CBD, 13.5% had gallstones, and 10.8% had biliary sludge. Regarding hospitalization status, 43.2% of the individuals were discharged, 27% were admitted to the internal medicine ward, 18.9% were admitted to the general surgery ward, and 10.8% were referred to other centers. All referrals were due to the unavailability of ERCP in our province (Figure 2).

A statistically significant difference was found between females and males in the AST variable (U=88.50; $p<0.05$). The results indicate that AST levels were significantly higher in women than in men. Furthermore, no statistically significant differences were found between the groups for age (p=0.280), WBC (p=0.790), CRP (p=0.125), ALT (p=0.742), GGT (p=0.065), LDH (p=0.091), total bilirubin (p=0.742), and direct bilirubin (p=0.975) (Figure 3).

No statistically significant differences were found in the biochemical parameters WBC, ALT, AST, and LDH according to the USG/CT/MRCP results. Since the data were not normally

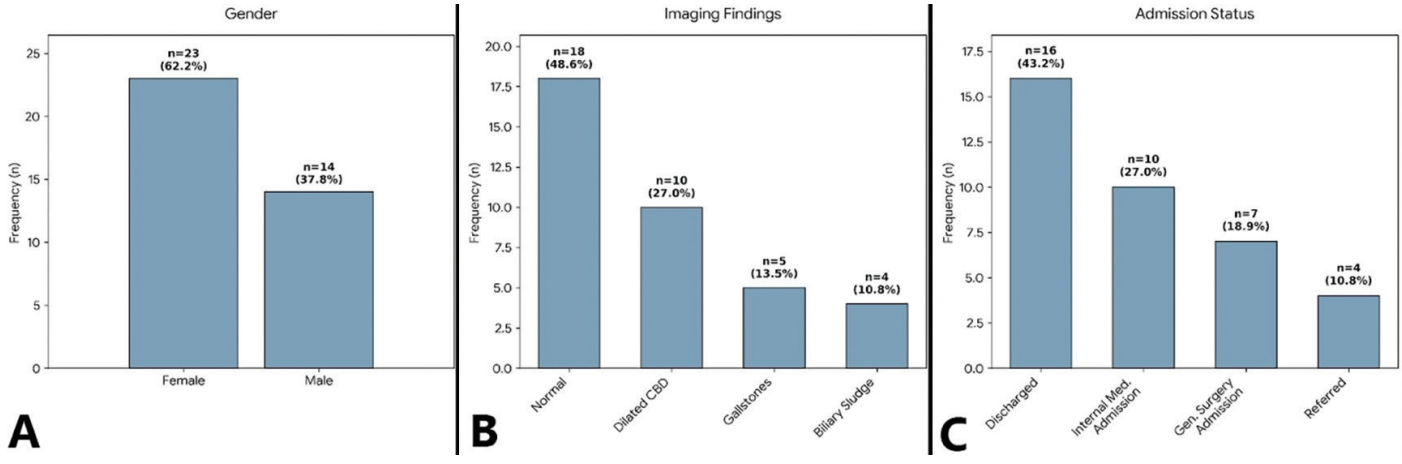

Figure 2. Frequency and percentage distributions of categorical variables
A) Gender, B) Imaging finding, C) Admission status

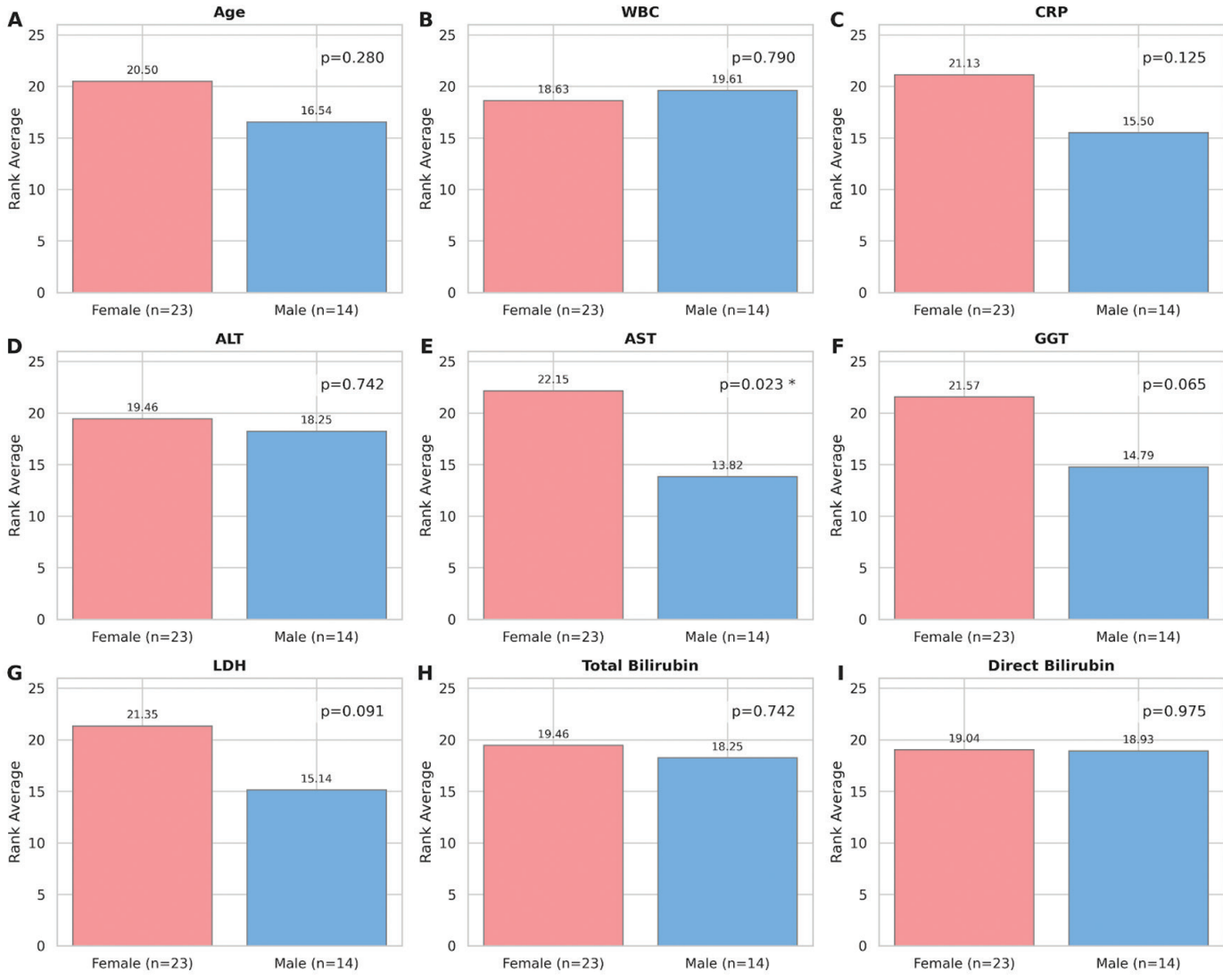

Figure 3. Mann-Whitney U test results for the comparison of biochemical parameters by gender

A) Age, B) WBC, C) CRP, D) ALT, E) AST, F) GGT, G) LDH, H) Total bilirubin, I) Direct bilirubin

The Mann-Whitney U test was applied to evaluate differences between gender groups in biochemical parameters that did not show a normal distribution. *p<0.05, **p<0.01, and ***p<0.001 were considered statistically significant

WBC: White blood cell count, CRP: C-reactive protein, ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, GGT: Gamma-glutamyl transferase, LDH: Lactate dehydrogenase

distributed, the analysis was performed using the Kruskal-Wallis test. A statistically significant difference in CRP levels was found between the groups (H=8.543, p=0.036). Median CRP values were lower in the normal and dilated CBD groups and higher in the gallstone and biliary sludge groups. A significant difference in total bilirubin levels was found between the groups (H=22.139, p<0.001). Post hoc tests were conducted to determine which groups differed. Dunn-Bonferroni post hoc analysis indicated that these differences stemmed from the dilated CBD and biliary sludge groups (p=0.006). Significant differences were detected between the normal group and the biliary sludge (p=0.023), gallstone (p=0.005), and dilated CBD (p<0.001) groups. Total bilirubin levels in the dilated CBD and biliary sludge groups were higher than in the normal group. The gallstone group had lower levels than the dilated CBD and biliary sludge groups. Groups differed significantly in direct bilirubin levels (H=21.997, p<0.001). According to the Dunn-Bonferroni post hoc analysis, significant differences were observed between the normal imaging group and the biliary sludge (p=0.016), gallstone (p=0.007), and dilated CBD (p<0.001) groups. Direct bilirubin

levels were higher in the dilated CBD and biliary sludge groups than in the normal group. The gallstone group had a lower level than the dilated CBD and biliary sludge groups (Table 1).

A statistically significant difference between the groups was found for CRP, AST, LDH, total bilirubin, and direct bilirubin ($p<0.05$). Consequently, levels of CRP, AST, LDH, total bilirubin, and direct bilirubin differed by hospitalization status. Analysis using the Kruskal-Wallis test revealed a statistically significant difference between groups with respect to the relevant variables. Post hoc analysis was performed to determine which groups differed significantly. Regarding the CRP variable, a significant difference was found between the referred patients and patients admitted to the internal medicine service ($p=0.027$), and between the referred patients and those admitted to the general surgery service ($p=0.030$). Examination of CRP levels showed that median values were lower in the discharge and referral groups and higher in the internal medicine and general surgery admission groups. The difference in CRP by hospitalization status reflects a significant difference between these groups. For both total bilirubin and direct bilirubin, a significant difference ($p=0.010$) was found between those who were discharged and those admitted to internal medicine/general surgery services or referred. Specifically, AST levels were observed to be higher in the referral and internal medicine admission groups. LDH levels were notably higher in the internal medicine admission group. Total bilirubin and direct bilirubin levels were higher in the referral group (Table 2).

Examination of the Fisher–Freeman–Halton exact test results for hospitalization status according to USG, CT, and MRCP revealed a statistically significant difference between the groups ($p<0.001$). All referred patients had a dilated CBD, and MRCP revealed stones in the CBD, indicating the need for ERCP. Importantly, all referrals were necessitated solely by the unavailability of ERCP at our institution, and should not be interpreted solely as markers of clinical severity.

The Fisher–Freeman–Halton exact test results for gender by hospitalization status showed a statistically significant difference between the groups ($p=0.007$). It was observed that 43.5% of individuals admitted to the internal medicine service were women, whereas the discharge rate in male patients (64.3%) was higher than that in women. These results indicate that the need for hospitalization was significantly higher in female patients than in male patients (Table 3).

Discussion

Islam exempts patients with chronic illnesses from fasting. However, some individuals wish to fast, which may be associated with clinical deterioration in those who are medically medically unsuitable for fasting. Dietary habits change during the month of Ramadan (14). Generally, patients with diabetes mellitus and those with gastrointestinal diseases (ulcerative colitis, Crohn's disease, and peptic ulcer) are adversely affected by dietary changes, such as prolonged fasting. In the literature, beneficial effects of intermittent fasting, such as improving blood pressure, heart rate, cholesterol levels, and glycemic control, have also been reported (15). Additionally, it has been observed that fasting is associated with reduced incidence of diseases such

Table 1. Kruskal-Wallis H test results for the comparison of biochemical parameters according to USG/CT/MRCP results

Variables	Groups	Rank average	Median (min-max)	SD	H	p
CRP	Normal (n=18)	19.94	16.50 (5-181)	3	8,543	0,036*
	Dilated common bile duct (n=10)	11.85	8 (1-48)			
	Gallstones (n=5)	21.50	54 (2-155)			
	Bile sludge (n=4)	29.50	79 (20-176)			
Total bilirubin	Normal (n=18)	10.53	1.30 (0.80-2.80)	3	22,139	<0,001***
	Dilated common bile duct (n=10)	28.80	7.60 (2.40-12.60)			
	Gallstones (n=5)	25.80	4.80 (3.60-8.60)			
	Bile sludge (n=4)	24.13	8.40 (0.80-10.70)			
Direct bilirubin	Normal (n=18)	10.53	0.90 (0.40-1.40)	3	21,997	<0,001***
	Dilated common bile duct (n=10)	28.70	5.00 (1.30-9.20)			
	Gallstones (n=5)	25.40	3.30 (2.80-6.60)			
	Bile sludge (n=4)	24.88	6.20 (0.40-8.70)			

The Kruskal-Wallis test was applied to evaluate differences defined by USG/CT/MRCP results for biochemical parameters that were not normally distributed. *p<0.05, **p<0.01; ***p<0.001 were considered statistically significant
CRP: C-reactive protein, SD: Standard deviation, USG: Ultrasonography, CT: Computed tomography, MRCP: Magnetic resonance cholangiopancreatography

Table 2. Kruskal-Wallis H test results for the comparison of biochemical parameters according to hospitalization status

Variables	Groups	Rank average	Median (min-max)	SD	H	p
CRP	Discharged (n=16)	16.00	12.50 (5-170)	3	7,922	0,048*
	Referred (n=4)	9.63	7.50 (4-11)			
	Internal medicine admission (n=10)	23.80	47 (1-181)			
	General surgery hospitalization (n=7)	24.36	62 (2-176)			
AST	Discharged (n=16)	13.00	30.00 (10-55)	3	10,098	0,018*
	Referred (n=4)	20.13	160 (15-746)			
	Internal medicine admission (n=10)	26.50	76.50 (25-467)			
	General surgery hospitalization (n=7)	21.36	40 (26-95)			
LDH	Discharged (n=16)	12.09	196,00 (150-590)	3	12,471	0,006**
	Referred (n=4)	22.63	313 (200-550)			
	Internal medicine admission (n=10)	26.70	390,50 (228-520)			
	General surgery hospitalization (n=7)	21.71	258,00 (160-716)			
Total bilirubin	Discharged (n=16)	10.50	1.30 (0.80-4.20)	3	20,803	<0,001***
	Referred (n=4)	33.50	11.60 (5.41-12.60)			
	Internal medicine admission (n=10)	21.80	4.10 (1.00-10.60)			
	General surgery hospitalization (n=7)	26.14	5.80 (1.80-10.70)			
Direct bilirubin	Discharged (n=16)	10.66	0.90 (0.40-3.30)	3	19,988	<0,001***
	Referred (n=4)	33.25	8.05 (3.97-9.20)			
	Internal medicine admission (n=10)	21.80	3.05 (0.60-8.70)			
	General surgery hospitalization (n=7)	25.93	3.60 (1.12-7.90)			

The Kruskal-Wallis test was applied to evaluate differences between groups based on hospitalization status for biochemical parameters that were not normally distributed. *p<0.05, **p<0.01; ***p<0.001 were considered statistically significant
CRP: C-reactive protein, AST: Aspartate aminotransferase, LDH: Lactate dehydrogenase, SD: Standard deviation

Table 3. Chi-square test results for hospitalization status according to USG/CT/MRCP results

		Discharged	Referred	Internal medicine admission	General surgery hospitalization	Total	X^2	SD	p
USG/ CT/ MRCP	Normal	13 (81.3)	0 (0)	4 (40.0)	1 (14.3)	18 (48.6)	34.382	9	<0.001***
	Dilated common bile duct	2 (12.5)	4 (100.0)	4 (40.0)	0 (0)	10 (27.0)			
	Gallstones	0 (0)	0 (0)	1 (10.0)	4 (57.1)	5 (13.5)			
	Bile sludge	1 (6.3)	0 (0)	1 (10.0)	2 (28.6)	4 (10.8)			
Gender	Female	7 (30.4)	1 (4.3)	10 (43.5)	5 (21.7)		10.997	3	0.007**
	Male	9 (64.3)	3 (21.4)	0 (0)	2 (14.3)				

*p<0.05, **p<0.01; ***p<0.001 are statistically significant
USG: Ultrasonography, CT: Computed tomography, MRCP: Magnetic resonance cholangiopancreatography, SD: Standard deviation

as myocardial infarction, peptic ulcer, and heart failure (16,17). Understanding the associations between Ramadan fasting and clinical outcomes in patients with chronic conditions is crucial for both patients and physicians. Various fasting and nutritional patterns are used by individuals practicing intermittent fasting. The most popular is the "16-8" method; individuals do not consume any calories for 16 hours and use an 8-hour window for meals. Fasting during Ramadan is similar to this dietary method (2). Since diets of this nature restrict food intake for over 14 hours, glycogen stores are depleted first, followed by a decrease in cholesterol and triglyceride levels (18,19). Meo and Hassan (20) reported that Ramadan fasting reduces risk factors for proinflammatory and atherosclerotic diseases by causing a decrease in inflammation and proinflammatory cytokines such as IL-1b, IL-6, and TNFa. Physiologically, restricting food intake allows the digestive system to rest by restructuring the

gut microbiome. It also stimulates autophagy, supporting the elimination of impaired cellular components and the renewal of cells. When the migrating motor complex, responsible for intestinal cleansing, is activated, smooth muscle contractions occur, gastric acid is secreted, and particles pass into the small intestine. Pancreatic secretions and bile from the gallbladder are released to neutralize gastric acid. As bile fluid passes through the gastrointestinal system, it kills bacteria and prevents them from adhering to the intestinal wall (21). Consequently, studies investigating the association between prolonged fasting and enzymes released from the liver and bile have been conducted (11,12). Rapid consumption of high-calorie foods at iftar (the breaking of the fast) following prolonged hunger may be associated with symptomatic exacerbation in patients with biliary disorders. Skipping meals or prolonged fasting has been associated with reduced gallbladder emptying, thereby facilitating stone formation (22). During fasting, the gallbladder becomes hypotonic; bile volume and concentration increase, and its (bile) fluidity decreases. At iftar, the rapid consumption of foods that are usually high in fat and carbohydrates strongly stimulates the release of cholecystokinin. This may cause the gallbladder, filled with concentrated bile, to contract against a possible obstruction (stone or sludge), potentially contributing to the emergence of symptoms (21). It must be emphasized, however, that because no control group was included in this study, a direct causal relationship between Ramadan fasting and biliary symptom exacerbation cannot be established; the observed associations must be interpreted as hypothesis-generating. Consistent with the literature, a study conducted in Egypt reported fluctuations in liver enzymes in fasting patients but no significant change in bilirubin levels (22). In our study, bilirubin levels were significantly higher, particularly in the dilated CBD and biliary sludge groups. Importantly, this finding most likely reflects the greater anatomical severity and obstructive nature of the disease in these patients rather than a direct effect of fasting per se. Elevated bilirubin in the context of CBD dilatation and biliary sludge is a recognized marker of biliary obstruction severity; the emergency department setting inherently selects for patients who are more acutely unwell.

In the initial hours of fasting, there may be an increase in values indicating the risk of gallstones; as the body adapts to fat burning, the sudden release of this fat into the bloodstream can temporarily increase cholesterol levels, affecting bile composition (23). Hunger and dehydration have been shown to be associated with acalculous cholecystitis (12). In our study, there were no significant differences between the groups for ALT and AST values. There were no changes in AST, ALT, LDH, or GGT values in patients with calculous cholecystitis. The AST value was significantly higher in women than in men ($p<0.05$). CRP levels were significantly higher in patients with gallstones and biliary sludge. Total and direct bilirubin values were higher in the dilated CBD and biliary sludge groups than in the normal group. These laboratory associations most likely reflect the inherent severity of the underlying biliary pathology rather than a direct consequence of fasting, given the absence of pre-fasting or non-fasting comparison data. The female gender dominance (62.2%) in our study is noteworthy, and this finding aligns with the literature stating that gallstones are more prevalent in women (24). Hospitalization rates among female patients were significantly higher than among male patients ($p=0.007$). This association in female patients may reflect a more severe symptomatic course or a higher risk of complications (cholecystitis, pancreatitis, and other complications), though firm conclusions regarding causality require appropriately controlled prospective studies. It is reported that cholecystitis and CBD stone patients constitute approximately 15% of general surgery admissions (25). In our study, a similar proportion of patients (18.9%) were admitted to the general surgery service. On the other hand, it is reported that approximately 20% of patients with biliary sludge receive follow-up in internal medicine services because they require conservative treatment and ERCP (26). In our study, the admission rate to the internal medicine service was 27%. Median CRP values were lower in discharged and referred patients but higher in patients admitted to hospital wards. Furthermore, AST levels were higher in referred patients and in those admitted to the internal medicine service. Total bilirubin and direct bilirubin levels were also higher in the referral group. Collectively, these findings suggest that elevated CRP and bilirubin may serve as markers of disease severity in this clinical context, rather than being directly attributable to the fasting state.

Study Limitations

The primary limitations of our study are its single-center design and its relatively small sample size ($n=37$), which together constrain statistical power, particularly in subgroup analyses, and limit the generalizability of the findings. The most critical methodological limitation is the absence of a non-fasting or pre-Ramadan control group. Without a comparator cohort, it is not possible to determine whether the observed laboratory alterations and hospitalization rates are attributable to fasting itself or to the expected clinical course of biliary disease in this population. This study should therefore be regarded as descriptive and hypothesis-generating rather than inferential. Important confounding variables, including fasting duration, degree of dehydration, dietary content during iftar and suhoor, body mass index (BMI), and concurrent medications, were not systematically recorded or adjusted for. The inability to standardize nutritional habits during Ramadan further limits the interpretability of

associations between dietary patterns and clinical outcomes. Additionally, the exclusion of post-hospitalization follow-up data and post-discharge recurrence rates prevents the assessment of long-term effects. The study's other limitations include the absence of data on several clinically significant variables, such as patients' fever at admission, Murphy's sign, time elapsed from iftar or sahur to symptom onset, BMI, detailed comorbidity profiles, prior cholecystectomy or ERCP, final diagnosis at discharge, results of ERCP procedures for referred patients, length of hospital stay, and post-discharge recurrence rates.

Conclusion

This descriptive observational study suggests that Ramadan fasting may be associated with laboratory and clinical changes in patients with diseases of the biliary system, though no causal relationship can be established given the study design. In patients with biliary pathology presenting to the emergency department, the need for hospitalization and advanced investigation (ERCP) was high, particularly among those with elevated CRP and bilirubin levels. Female gender appears to be associated with higher hospitalization rates in this patient group. Clinically, patients with known biliary system diseases (e.g., gallstones or sludge) should be evaluated for individual risk prior to Ramadan; symptomatic patients should receive appropriate counselling regarding fasting; and dietary modifications should be implemented where appropriate. These findings underscore the need for well-designed, multicenter, controlled prospective studies with larger sample sizes to more rigorously assess the relationship between Ramadan fasting and biliary disease outcomes.

Ethics

Ethics Committee Approval: The study was initiated following the approval of the Kafkas Medical Faculty Ethics Committee (decision number: 02, date: 27.02.2024).

Informed Consent: Signatures were obtained from all patients for the informed consent form.

Footnotes

Authorship Contributions

Surgical and Medical Practices: L.Ş., T.G., Concept: L.Ş., Design: M.A.A., Data Collection or Processing: L.Ş., Analysis or Interpretation: M.A.A., Literature Search: T.G., Writing: L.Ş.

Conflict of Interest: No conflict of interest was declared by the authors.

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