Prevalence and characterization of acute biliary pancreatitis-associated upper gastrointestinal mucosal lesions

Akut bilîyer pankreatit’te üst gastrointestinal mukoza lezyonlarının yaygınlığı ve karakterizasyonu

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INTRODUCTION

Acute pancreatitis is an inflammatory disease of the pancreas and one of the leading gastrointestinal causes of hospitalization in the Western world (1). The majority of cases are caused by gallstone disease and alcohol abuse. Importantly, incidence is increasing in line with heavier alcohol consumption worldwide; survival rates are not improving with the advances in diagnosis and treatment (2).

Acute pancreatitis can lead to a clinical spectrum ranging from mild local manifestations to severe systemic complications. Local complications, such as gastritis, duodenitis, splenic vein thrombosis, and colonic necrosis, along with external compression of the common bile duct have been described in the course of pancreatitis (3). Previous studies have shown that mucosal lesions in the upper gastrointestinal tract complicate more than 50% of cases of acute pancreatitis (4-6). Helicobacter pylori (H. pylori) has been implicated as the major causative agent in cases of chronic gastritis and peptic ulceration worldwide, but its role in upper gastrointestinal mucosal lesions associated with acute pancreatitis is not known (7,8).

Therefore, the aims of this study were to retrospectively investigate the characteristics of upper gastrointestinal mucosal lesions associated with acute gallstone pancreatitis and the relation with H. pylori infection.

MATERIALS AND METHODS

The study was conducted as a single-center, retrospective, cohort study. The patient records of the Gastroenterology Department, Celal Bayar University Hospital, Manisa, Turkey, from 2006 to 2010 were reviewed. Acute pancreatitis was diagnosed by the presence of two of the following three factors: typical upper abdominal pain, hyperamylasemia and/or hyperlipasemia of more than three times the upper limit of normal, as well as typical radiologic findings of pancreatitis during abdominal ultrasonography and/or computed tomography (CT). Acute biliary pancreatitis was diagnosed as visualization of a common bile duct stone by ultrasonography, CT or magnetic resonance cholangiopancreatography. Patients who had undergone upper gastrointestinal endoscopy during the study were included in the analysis.

Background and Aims: Acute pancreatitis can be associated with various upper gastrointestinal mucosal lesions. However, their pathogenesis and clinical significance have been discussed rarely. The aim of this study was to retrospectively investigate upper gastrointestinal mucosal lesions in relation to the prevalence of Helicobacter pylori infection in acute biliary pancreatitis.

Methods: This study was carried out in 94 patients with acute biliary pancreatitis and 179 control dyspeptic patients with or without gallstone disease. In all research subjects, upper gastrointestinal endoscopy was performed, and two biopsy specimens were taken from the antrum and gastric body for histologic examination and Helicobacter pylori detection.

Results: 71% of patients with acute biliary pancreatitis had evidence of upper gastrointestinal mucosal abnormalities. Esophagitis and peptic ulceration were more prevalent compared to the control groups (p<0.05). Peptic ulceration associated with pancreatitis showed lower Helicobacter pylori positivity compared to controls (p<0.05).

Conclusions: Gastrointestinal mucosal lesions are common in the course of acute biliary pancreatitis. Peptic ulceration is less strongly associated with Helicobacter pylori.

Key words: Biliary pancreatitis, peptic ulcer disease, Helicobacter pylori

Giriş ve Amaç: Akut pankreatit’li olgularda akut pankreatitle bağılı üst gastrointestinal mukoza lezyonların görülüldüğü ve akut pankreatit ile ilişkili olduğu olduğu belirtilmesi, bu ilişkinin patogenezi ve klinik önemi tam olarak araştırılmamış ve ortaya çıkarılmamıştır. Bu çalışmanın amacı klinikte akut biliyer pankreatit tanı ile yatan olgularda üst gastrointestinal mukoza lezyonları saptamak ve bu lezyonlarla Helikobakter pilori prevalansını retrospektif olarak belirlemektir.

Gerek ve Yöntem: Çalışmamızda kliniğiımızde akut biliyer pankreatit tanı ile yatan olgularda üst gastrointestinal mukoza lezyonları saptanmak ve bu lezyonlarla Helikobakter pilori prevalansının belirlenmesi amaçlanmıştır. Çalışmamızın genel ele alınan birçoğundan antrum ve korpus, antropylorik bölgelerinden (AP) ve PZ'den biopsy blok alınmıştır. Her biopsy bloktan 10 mikroskopik kesit alınarak'esterinibeşirülmiştir.

Bulgular: ántruma, pilore, pylorus ve fundusa esotif iplikler, esofajit, peptik ve peroperatif erozyonlar belirlenmiştir. Buna ek olarak, esotif ipliklerle esotif ipliklerin saptanabilmesi ve Helikobakter pilori pozitivitesinin belirlenmesi sonucunda, Helikobakter pilori prevalansının belirlenmesi amaçlanmıştır.

their hospitalization were included in the study. We routinely recommend upper gastrointestinal endoscopy to all hospitalized patients with the initial diagnosis of acute pancreatitis in order to rule out any other cause of abdominal pain or hyperlipasemia, unless this is contraindicated. Patients were excluded if they had a history of acid suppression therapy, antibiotic or non-steroidal anti-inflammatory drug treatment during the previous four weeks or any known peptic ulcer disease, chronic pancreatitis or pancreatitis from another etiology.

Data collected from the case notes were as follows: age, gender, comorbid risk factors and other possible etiologic factors such as alcohol consumption, and serum calcium and triglyceride levels. All patients with the initial diagnosis of acute pancreatitis underwent an abdominal CT to evaluate the severity of the acute pancreatitis, and were graded from A to E according to the scoring system established by Balthazar et al. (9). Ranson’s criteria on admission were measured and recorded (10). Suspected and documented upper gastrointestinal bleeding was also searched from the patient files.

Our control group included patients with functional dyspepsia according to the Rome II criteria (11). They were divided into two subgroups according to the presence or absence of gallstones on ultrasound, as Group 1 and Group 2, respectively. Patients who had been receiving acid suppressive therapy or antibiotics and those who had a history of acute pancreatitis and cholangitis were excluded.

All groups of patients underwent endoscopy, and esophageal findings were assessed using the Los Angeles classification (12). Two biopsy specimens were taken from the antrum and gastric body for histological examination and detection of H. pylori. Biopsy specimens were fixed in formalin, embedded in paraffin, and stained with a modified toluidine blue for detection of H. pylori.

The study was carried out with the approval of the Institutional Review Board of Celal Bayar University Medical Center, Manisa, Turkey. The study protocol conformed to the ethical guidelines of the Declaration of Helsinki. Data were compared by \( \chi^2 \) (SPSS 11.5 for Windows; SPSS Inc., Chicago, IL) or Fisher exact tests, as appropriate. Statistical significance was considered to be \( p < 0.05 \).

RESULTS

One hundred and six patients with acute pancreatitis who had undergone upper gastrointestinal endoscopy during their hospitalization were identified. Twelve patients were excluded from the study (etiologic factors other than gallstone disease). The baseline characteristics of patients were similar in the acute biliary pancreatitis group and control groups (Table 1). Sixty-three patients were female and 31 were male. The mean age was 48.1±18 years (range: 21-87). One hundred and seventy-nine patients were identified as controls. Of those, 84 patients (Group 1) had gallstones and 95 patients (Group 2) did not. The mean ages for control Groups 1 and 2 were 51.3±18 and 50.2±18 years, respectively. Both control groups showed female predominance (73% and 61%).

Firstly, the correlation between acute biliary pancreatitis and gastrointestinal mucosal lesions was investigated. Seventy-one percent (n=66) of patients with acute gallstone pancreatitis were found to have abnormal findings during upper gastrointestinal endoscopy, including esophagitis, gastritis and peptic ulcer, and the rates were significantly higher when compared to both control groups. The incidence of esophagitis was significantly higher in patients with acute biliary pancreatitis than the control groups (\( p < 0.05 \)). There was a significant rise in the incidence of gastric and duodenal ulcer in the pancreatitis group (\( p < 0.01 \)) compared to controls. The anatomic localization of gastrointestinal mucosal lesions is illustrated in Table 2. No patient was reported to have upper gastrointestinal bleeding. There was no significant difference in the CT grading and Ranson’s scoring between patients with normal endoscopic findings and gastrointestinal mucosal lesions (Table 3).

The histological analysis of biopsy samples from the gastric antrum and corpus revealed no difference in the prevalence of H. pylori infection between groups. However, patients with

| Table 1. Baseline characteristics of the patient and control population |
|------------------------|-----------------|------------------|-----------------|---|
| **Pancreatitis** n (%) | **Dyspepsia and Gallstone** n(%) | **Dyspepsia** n (%) | **p** |
| Age 48±18 | 51±18 | 50±18 | NA |
| Male 31 (33%) | 22 (27%) | 37 (39%) | NA |
| Female 63 (67%) | 62 (73%) | 58 (61%) | NA |
| Hemoglobin 11.8±1.2 | 13.8±0.2 | 12.8±0.8 | NA |
| Hematocrit 34±2.8 | 36±1.7 | 35±0.9 | NA |
| ALT 148±16 | 34±11 | 21±0.8 | <0.05 |
| AST 126±14 | 36±12 | 28±7 | <0.05 |
| GGT 72±7 | 41±4 | 34±2 | <0.05 |
| ALP 234±28 | 80±18 | 72±12 | <0.05 |
pancreatitis who had peptic ulceration at endoscopy showed significantly lower *H. pylori* positivity than controls. The *H. pylori* prevalence in patients with gastrointestinal mucosal lesions is summarized in Table 4.

### DISCUSSION

In this study, we evaluated the prevalence of upper gastrointestinal mucosal lesions and their characteristics in acute biliary pancreatitis. The clinical significance of these lesions was also investigated retrospectively. We found a significant association between upper gastrointestinal mucosal abnormalities and acute biliary pancreatitis, with 71% of patients having these abnormalities. Previous studies have also shown that more than half of the patients with acute pancreatitis were complicated with upper gastrointestinal mucosal lesions (4,5). Our study population with acute biliary pancreatitis was predominantly female (67%). Amongst the global population, there is a higher prevalence of gallstone disease in women. It can therefore be seen that the risk of development of acute pancreatitis is greater in females, especially in the low alcohol-consuming population.

Upper gastrointestinal endoscopies revealed that esophagitis was significantly more common in the acute biliary pancreatitis group than the dyspepsia group. Most patients with acute pancreatitis develop some level of nausea and vomiting, which may partially explain why we observed more esophageal lesions in patients with pancreatitis. It is also well known that the nasogastric tubes themselves may lead to mucosal lesions in the esophagus and/or stomach. Peptic ulcer has also been found to be associated with pancreatitis. Duodenal ulcer is the prevailing endoscopic finding in patients with alcoholic chronic pancreatitis and acute pancreatitis (13); similarly, we encountered a duodenal ulcer in live patients of the study population. In addition, we also observed a high incidence of antral ulcers in the biliary pancreatitis group, which has not been observed previously (6).

There was no association between the presence of upper gastrointestinal mucosal lesions and the severity of pancreatitis.
according to the two severity scores, which shows consistency with the previous studies (4,5). However, a recent study by Lee and colleagues (6) reported the clinical association of peptic ulcers with APACHE scores in acute pancreatitis patients. This can be explained by application of endoscopy at different time points of the disease course. We usually perform upper gastrointestinal endoscopy during the first two days of abdominal pain rather than just before beginning oral feeding. In our study, none of the patients suffered complications such as bleeding. This can be explained by either a relatively small research population or routine prophylaxis with H2 receptor blockers and proton pump inhibitors.

By histological examination, the prevalence of H. pylori infection was found as 64% and 55% in the pancreatitis and control groups, respectively. Khan et al. (14) reported a 20% incidence of H. pylori in alcohol-induced acute pancreatitis, which was similar to the control groups. Manes et al. (15) found that the prevalence of H. pylori infection in patients with chronic pancreatitis was similar to that of patients with alcoholic liver cirrhosis and healthy subjects. Our results indicated a higher H. pylori positivity in all subgroups, correlating with the higher prevalence of H. pylori in Turkey. H. pylori infection is strongly associated with peptic ulceration of the duodenum and stomach. In our study, almost all peptic ulcers in the dyspepsia group were associated with H. pylori infection, probably due to the exclusion of non-steroidal anti-inflammatory drug users. However, H. pylori prevalence was significantly lower in patients with peptic ulcers and pancreatitis and similar to the non-ulcer dyspeptic population. Whether the lower incidence of H. pylori infection in this patient group can be partly explained with stress ulcer, the pathogenesis remains unclear. The pathogenesis of these lesions is not completely understood, but gastric acid secretion, mucosal ischemia and reflux of upper gastrointestinal contents into the stomach may have a role in this process, similar to stress ulcers (16-18). Regarding the ulcer localization and H. pylori status of the patients, these lesions should be defined as pancreatitis-associated peptic ulcers rather than stress-associated mucosal damage.

In conclusion, esophagitis and antral and duodenal ulcers are common endoscopic findings in acute biliary pancreatitis, although they are not correlated with the severity of pancreatitis. H. pylori is less strongly associated with upper gastrointestinal mucosal lesions in acute biliary pancreatitis.

REFERENCES