Prevalence of ischemic enterocolitis in patients with acute pancreatitis

YOSHIHISA TAKAHASHI, JUN-ICHI FUKUSHIMA, TOSHIRO FUKUSATO, JUNJI SHIGA, FUMIHICO TANAKA, TETSUO IMAMURA, MASASHI FUKAYAMA, TOHRU INOUE, SEIICHIRO SHIMIZU, and SHIGEO MORI

1 Department of Pathology, Teikyo University School of Medicine, 2-11-1 Kaga, Itabashi-ku, Tokyo 173-8605, Japan
2 Department of Anatomy, Teikyo University School of Medicine, Tokyo, Japan
3 Department of Surgical Pathology, Teikyo University Hospital, Tokyo, Japan
4 Department of Pathology, Graduate School of Medicine, University of Tokyo, Tokyo, Japan
5 Department of Pathology, Tokyo Kosei Nenkin Hospital, Tokyo, Japan
6 Department of Pathology, Showa General Hospital, Kodaira, Japan

Background. A considerable number of acute pancreatitis cases have been reported to be complicated by nonocclusive mesenteric ischemia. However, no reports have ever referred to the incidence of ischemic enterocolitis in patients with acute pancreatitis, using a series of autopsy cases. Here, we report our review of autopsy cases of patients with acute pancreatitis to examine the incidence of associated ischemic enterocolitis.

Methods. The intestinal and pancreatic slides of 48 autopsy cases of patients with acute pancreatitis were reviewed and the incidence of ischemic enterocolitis was determined. Clinical case records were also reviewed. Results. Thirteen (27%) of 48 autopsy cases of patients with acute pancreatitis were complicated by ischemic enterocolitis. The frequency of shock was significantly higher in patients with ischemic enterocolitis than in those without ischemic enterocolitis. The intestinal lesion was diffuse in many cases and gangrene was not an unusual finding.

Conclusions. The incidence of ischemic enterocolitis in patients with acute pancreatitis was much higher than that in the previous reports. Clinicians who treat patients with acute pancreatitis should consider ischemic enterocolitis as one of the frequent and severe complications of this condition.

Key words: acute pancreatitis, ischemic enterocolitis, nonocclusive mesenteric ischemia

Introduction

Acute pancreatitis is a potentially fatal disease with an overall mortality rate of 7%–11%.1–3 Severe acute pancreatitis is often associated with pancreatic necrosis, and the mortality rate is even higher among such patients.4,5 Histologically, acute pancreatitis is divided into two types, acute interstitial pancreatitis and acute hemorrhagic pancreatitis. Acute interstitial pancreatitis is defined as the presence of acute intrapancreatic inflammation, with or without peripancreatic inflammation, but without disruption of the pancreatic microvasculature. Acute hemorrhagic pancreatitis is defined by the presence of disruption of the pancreatic microcirculation that results in necrotizing pancreatitis.

Acute pancreatitis is occasionally complicated by intestinal lesions, which include functional ileus, mechanical obstruction from extrinsic compression, fistulation, and ischemic enterocolitis.6 Formerly, it had been estimated that colonic complications occurred in only 1% of patients with acute pancreatitis.7 However, in 1989, it was reported that 15 out of 100 patients with acute necrotizing pancreatitis requiring surgical therapy presented with colonic involvement, including 3 with ischemic colonic necrosis.8 In addition, it was recently reported that 6.7% of cases of acute pancreatitis were complicated by nonocclusive mesenteric ischemia (NOMI).9 In the above-mentioned reports, the colonic lesions were detected at operation or autopsy in many cases; thus, differences in the reported frequency of colonic lesions might reflect how frequently operations or autopsies were performed. In the light of this possibility, we considered it useful to investigate a consecutive series of autopsy cases in order to determine accurately the prevalence of colonic lesions in patients with acute pancreatitis. In this study, we retrospectively examined intestinal complications in 48 autopsy cases of patients with acute pancreatitis. Our findings clarified that ischemic enterocolitis was observed much more frequently than in the previous reports.
Subjects and methods

We examined autopsy records at Teikyo University Hospital, Tokyo University Hospital, Tokyo Kousei Nenkin Hospital, and Showa General Hospital from 1993 to 2003, and found 54 patients with the pathological diagnosis of acute pancreatitis. The frequency of acute pancreatitis in all autopsy cases was 1.6%. We reviewed all the pancreatic and intestinal slides of these 54 patients carefully, together with the autopsy records, and determined the frequency of ischemic enterocolitis. Sections from each patient were taken from the areas of the greatest pathological interest (i.e., hemorrhagic or necrotic areas of the pancreas, and hemorrhagic, erosive, ulcerative, or necrotic areas of the intestine). In each patient, the number of sections of the pancreas and intestine ranged from one to five and from zero to seven, respectively.

In this study, we defined acute interstitial pancreatitis as marked interstitial edema, dilatation of small vessels and inflammatory cell infiltration, and absence of hemorrhage or necrosis. We defined acute hemorrhagic pancreatitis as distinct pancreatic hemorrhage, necrosis, and inflammatory cell infiltration. At present, there are no established pathological diagnostic criteria for ischemic enterocolitis. In this study, we paid special attention to the following findings: (i) mucosal necrosis (especially, epithelial cell necrosis), (ii) congestion and edema of the submucosa, (iii) scattered erosions or ulcers, and (iv) extensive necrosis of the intestinal wall. We diagnosed cases with findings (i), (ii), (iii), and (iv), as ischemic enterocolitis. These criteria are rather stringent, and those cases that met these criteria were certainly regarded as showing ischemic enterocolitis. One pathologist at our hospital made a pathological diagnosis of acute pancreatitis for very small necrotic foci in the pancreas and/or peripancreatic fat tissue that could be explained by the postmortem leaking of pancreatic juice. We excluded 6 cases diagnosed by this pathologist from the present study. All cases diagnosed by other pathologists showed obvious findings of acute pancreatitis. Hence, our analysis included a total of 48 autopsy patients with obvious pathological findings of acute pancreatitis. Clinical case records were reviewed for each patient.

In the 48 cases in our study, patient ages ranged from 32 to 87 years (mean, 64 years); 32 patients were male and 16 patients were female. A clinical diagnosis of acute pancreatitis had been made in only 17 of these patients; in the remaining patients, acute pancreatitis was an incidental finding revealed by autopsy. Acute pancreatitis was the initial reason for admission to the hospital in 17 patients; in the remaining patients, cancer, cardiovascular disease, digestive tract disease, and other conditions were the initial reason for admission. Acute pancreatitis was the final cause of death in 21 patients; in the remaining patients, cancer, pneumonia, liver failure, cerebral infarction, and other conditions were the main causes of death. Acute pancreatitis was the cause of death in 9 of the 31 patients with incidentally diagnosed acute pancreatitis. The time that elapsed from admission to death ranged from 0 to 206 days (mean, 40.9 days). According to the severity classification of the Japanese Ministry of Health and Welfare, of the 17 cases that were clinically diagnosed, 16 were classified as severe; in the remaining 1 case, the severity could not be determined because the clinical data were insufficient. Histopathologically, all cases but 1 met the criteria for acute hemorrhagic pancreatitis. Among the 48 patients, disseminated intravascular coagulation (DIC), shock, and sepsis occurred in 21, 19, and 12, respectively. The suggested etiology of acute pancreatitis was alcoholic in 11 patients, stones in the bile duct in 6, operation in 5, drug use in 1, and idiopathic in 25 patients.

The $\chi^2$ test was applied to compare the differences in the frequency of DIC, shock, and sepsis between patients with and those without ischemic enterocolitis.

Results

Our histological review revealed that 13 (27%) of 48 autopsy cases of patients with acute pancreatitis were complicated by ischemic enterocolitis. The clinicopathological features of these 13 patients are shown in Table 1, numbered from 1 to 13. The patients’ ages ranged from 51 to 86 years (mean, 68 years); 8 patients were male and 5 patients were female. A clinical diagnosis of acute pancreatitis had been made in only 5 patients. Acute pancreatitis was the initial clinical manifestation in 7 patients (cases 1,3–6,9,12); in the remaining patients, cerebral infarction, thoracic aortic aneurysm, pneumonia, and other conditions were the main initial clinical manifestations. Acute pancreatitis was the cause of death in 7 patients (cases 3–7,9,12); in the remaining patients, cerebral infarction, acute myocardial infarction, pneumonia, and other conditions were the main causes of death. One patient died due to gastrointestinal hemorrhage caused by ischemia (case 1). Of 8 patients who died without being clinically diagnosed as having acute pancreatitis, serum amylase had been elevated in 2, had not been elevated in 4, and had not been measured in 2 patients. Computed tomography (CT) scans had not been performed for these 8 patients. There were no patients in whom a long duration of circulatory failure, or DIC, or sepsis caused both the ischemic enterocolitis and acute pancreatitis. All clinically diagnosed cases of acute pancreatitis were severe. All but 1 showed acute hemorrhagic pancreatitis. DIC, shock, and sepsis were found in 5, 9, and 5 patients,