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Original Research Article

Impact of etiology on course and outcomes of severe acute pancreatitis

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ARTICLE INFO

Article history:

Received 23 April 2014

Accepted 24 April 2015

Available online 2 July 2015

Keywords:

Severe acute pancreatitis

Etiology

Outcome

ABSTRACT

Background and objective: Since the influence of etiological factors on the course and outcomes of acute pancreatitis (AP) is not fully understood yet, the aim of the study was to compare the outcomes of alcoholic and biliary severe acute pancreatitis (SAP).

Materials and methods: We investigated 81 patients with alcoholic and biliary SAP. Demographic data, etiologic factors, severity scores, intra-abdominal pressure, imaging studies, interventions, and treatment outcomes were prospectively entered into specially maintained database and subsequently analyzed.

Results: No statistically significant difference was observed in the prevalence of SAP in biliary and alcoholic AP groups ($P = 0.429$). Although, in the biliary SAP group patients were predominantly elderly women ($P = 0.003$), the total in-hospital stay was longer in alcoholic SAP patients ($P = 0.021$). The abdominal compartment syndrome developed more frequently ($P = 0.041$) and necrosectomy was more frequently performed in alcoholic SAP group (not statistically significant). Although not statistically significant, a lower mortality rate among biliary SAP patients (25.0% vs. 13.5%) was observed.

Conclusions: We defined a trend toward decreased incidence of infected necrosis in larger volume ($\geq 30\%$) pancreatic necrosis, absence of abdominal compartment syndrome, lower rate of necrosectomies, shorter in-hospital stay, and an insignificantly reduced mortality rate in biliary SAP patients, indicating more favorable course of biliary SAP.

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Peer review under the responsibility of the Lithuanian University of Health Sciences.



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<http://dx.doi.org/10.1016/j.medici.2015.04.002>

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1. Introduction

Throughout the last decades, acute pancreatitis (AP) remains one of the most extensively investigated therapeutic problems with a hardly improvable course. The incidence of the first attack of AP has increased in past decades and varies from 4.9 to 200 cases per million inhabitants [1,2]. In 80% of AP patients, pancreatic injury is mild or moderate and self-limiting, requiring only brief hospitalization to recover without complications. About 25% of the patients with AP develop severe acute pancreatitis (SAP), which is strongly associated with organ failure and local complications such as pancreatic or peripancreatic necrosis, formation of walled-off necrosis or pseudocyst; infected pancreatic necrosis is observed in 30%–70% of SAP patients [3]. The extent and infection of pancreatic necrosis directly correlates with morbidity and mortality [4,5]. Due to considerable improvements in the diagnosis and management of these patients, overall mortality of the disease has decreased, but still ranges between 15% and 25% [6]. The extent of pancreatic necrosis as well as the presence of secondary bacterial infection have been identified as major determinants of lethal outcomes after the third week, representing the most common cause of late mortality [6]. Secondary infection of pancreatic necrosis increases the mortality up to 25% in young or middle-aged patients and even up to 50% in the aged patients [5].

The influence of etiological factors on the course and outcomes of AP is not fully understood yet [7,8]. The dominant (>80%) etiological factors of AP are gallstones and alcohol consumption [1,9]. Prevalence of these two main etiologic factors in AP varies considerably among different countries, reflecting differences in culture, tradition and lifestyle. Predominance of biliary pancreatitis has been reported in southern countries, on the contrary a similar frequency or predominance of alcoholic pancreatitis has been observed in northern ones [10].

The aim of this single center study was to compare the clinical course and outcomes of biliary and alcohol induced SAP. The primary endpoints in this study were development of pancreatic necrosis $\geq 30\%$ and infected pancreatic necrosis, as well as the need for minimally invasive and/or surgical interventions. Secondary endpoints of the study were duration of intensive care unit (ICU) and overall hospital stay, prevalence of multidrug resistant microorganisms, occurrence of high intra-abdominal pressure and abdominal compartment syndrome, overall morbidity and mortality of alcoholic and biliary SAP patients.

2. Materials and methods

2.1. Patients

The study population comprised 81 patients with alcoholic or biliary SAP admitted to the Department of Surgery, Hospital of Lithuanian University of Health Sciences, from January 1, 2007, to December 31, 2009. Biliary SAP was diagnosed in 37 cases; SAP of an alcoholic origin was diagnosed in 44 cases ($P = 0.429$).

The Regional Ethical Committee approved the study (protocols Nos. BE-2-47 and P1-113/2005), and all the patients provided written informed consent. All analyzed demographic and clinical data was prospectively entered into a specially designed database. Inclusion criteria were defined as follows: (1) a time interval from the onset of abdominal symptoms and admission was ≤ 72 h; (2) at least 3-fold elevated levels of serum amylase or lipase; (3) no previous history of acute or chronic pancreatitis; (4) SAP established by multifactorial clinical scores (APACHE II > 7 ; Glasgow-Imrie > 2 ; MODS > 2); and peak C-reactive protein value of > 150 mg/L; and/or pancreatic necrosis of $\geq 30\%$ as defined by contrast enhanced computed tomography (CECT) scan; and (5) alcoholic or biliary SAP. Patients reporting alcohol consumption shortly before the onset of symptoms, having no gallstones in the gallbladder or bile ducts as defined by abdominal ultrasound (US) and/or CT scan were included in the alcohol induced SAP group, whereas patients with gallbladder and/or bile duct stones on abdominal US and/or CT scan, elevated serum bilirubin and/or liver enzymes, and no history of recent alcohol intake were included in the biliary SAP group.

The severity of the disease and clinical status were assessed on the day of admission and reassessed using the same prognostic tools every week and when the clinical condition deteriorated. Prognostic scores (APACHE II, MODS) were assessed on the day of admission. The CECT scan was performed on day 4–7 after the onset of disease to demonstrate the presence of pancreatic necrosis. According to CT scan results patients in whom peri-/pancreatic necrosis exceeding 30% was determined were allocated to subgroups (alcoholic SAP vs. biliary SAP, peri-/pancreatic necrosis $\geq 30\%$).

All patients were managed according to our standard AP treatment protocol (based on the recent international guidelines) [11–17]. Early antibiotic treatment (ciprofloxacin 800 mg/day, metronidazole 1500 mg/day for 14 days) was initiated, if at least one of the following indications was present within first 72 h from the onset of the disease: CRP value exceeded 150 mg/L, APACHE II score was > 7 and/or necrosis $> 30\%$ was demonstrated on CECT.

Patients with SAP referred to our hospital from other institutions later than 72 h from the onset of the disease, recurrent AP (more than one episode) and chronic pancreatitis were excluded from this study.

2.2. Interventions

The minimally invasive ultrasound-guided drainage (UGD) and/or open necrosectomy were performed when the patient's condition deteriorated despite intensive conservative treatment with progression of inflammation and/or organ dysfunction [15,18]. UGD was employed to evacuate the fluid collections and to postpone or to obviate the need of open necrosectomy. The latter was performed in patients with fine needle aspiration (FNA) proven infected necrosis and/or clinical signs of generalized sepsis. Decompressing fasciotomy or UGD of intraperitoneal fluid collections was performed to alleviate high intra-abdominal pressure (IAP ≥ 20 mm Hg) in case of abdominal compartment syndrome (ACS) [17,19].

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