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Original Article

Acute pancreatitis in elderly patients: A retrospective evaluation at hospital admission

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ABSTRACT

Background and aims: Acute pancreatitis (AP) in elderly may have an aggressive course due to co-morbidity high rate and severe presentation. We retrospectively evaluated AP severity and its underlying factors in a group of elderly patients compared with an adult population sample.

Methods: Forty-two elderly patients (65–102 years) and 48 controls (19–64 years) admitted at our Unit for biliary or alcoholic AP were retrospectively enrolled. AP severity was evaluated by the Atlanta classification and Ransom score. Laboratory investigations and demographic data were collected. Comparison between the two groups was performed by t-test, ANOVA or Fisher's exact test. A multinomial logistic regression was used to determine factors affecting AP severity.

Results: Elderly patients showed more severe Atlanta (1.81 ± 0.75 vs 1.29 ± 0.46; $p = 0.007$) and higher Ransom (2.52 ± 1.57 vs 0.75 ± 0.73; $p < 0.0001$) scores. No death was observed. Elderly patients consumed more drugs than controls, had higher rates of cardiovascular, pulmonary and renal co-morbidity, showed higher creatinine (1.09 ± 0.41 vs 0.81 ± 0.18; $p = 0.004$) and lower calcium levels (8.43 ± 0.48 vs 8.88 ± 0.44; $p = 0.002$). We observed only one case of fluid necrosis in an old patient. Non-necrotic fluid collections were more common in the elderly (40.5% vs 12.5%; $p = 0.003$). At multivariate analysis, AP severity was influenced by white blood cell-count (WBC: OR = 1.94; $p = 0.048$), aspartate-transaminase-levels (AST: OR = 1.97; $p = 0.02$), serum lactate-dehydrogenase (LDH: OR = 1.07; $p = 0.047$) and Ransom score (OR = 70.4; $p = 0.036$) in elderly, while only Ransom score correlated in controls (OR = 66.04; $p < 0.001$). The etiology (biliary/alcoholic) did not influence the severity.

Conclusions: Elderly patients usually undergo a severe AP course, but without increase of mortality. High WBC, LDH, AST and Ransom score at the onset may predict AP severity.

1. Introduction

Acute pancreatitis (AP) is a sudden inflammatory condition of the pancreas [1]. It represents one of the most common and severe complications of gallstones, but it may be caused by alcohol misuse, dyslipidemia, drugs or other factors [1]. AP has an annual incidence of 13–45 cases per 100,000 people, and it is in continuous increase in the USA [2]. The clinical impact of AP on inpatient mortality is remarkable, since it represents the fifth leading cause of hospital deaths [2]. However, the clinical picture of AP ranges from self-limiting acute inflammation of the pancreas to severe systemic involvement with multi-organ failure. For this reason, several classifications of the severity of AP have been proposed. The updated Atlanta classification [3] is one of the most recent and used. This classification describes three grades of severity: mild, moderately severe and severe. The mild form arises without any organ failure, nor local or systemic complications. The moderately severe grade is characterized by transient (<48 h) organ failure and/or local or systemic complications. Finally, the severe AP shows persistent organ failure (>48 h). The severity and prognosis of AP are strongly influenced by chronic co-morbidities, such as cardiovascular, renal and dysmetabolic disorders [4–7].

In Western countries, the improvement of health conditions has led to the increasing aging of the population, with larger proportions of people more than 65 years old. This phenomenon has caused the large diffusion of some diseases such as cardiovascular accidents or dementia [8]. AP seems to follow this trend. Indeed, Goldacre et al. [9] have shown that the hospital admission rate for AP is the highest for geriatric population in a large cohort of patients. In elderly patients, AP shows peculiar clinical and prognostic traits [10]. In few available studies on geriatric populations, high mortality and co-morbidity rates have been demonstrated [11–13]. These studies, indeed, have shown that elderly patients presented more commonly with a severe form of AP, at the hospital

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admission. For example, Tenner et al. underlined that complications, such as infected pancreatic necrosis, are found in 50% of elderly population, thus increasing the risk of death [14]. Moreover, de Beaux et al. [15] displayed that the mortality of AP increases with age from 2% to 11%.

Herein, we describe, in a retrospective analysis, our experience on elderly patients by comparing clinical, demographic and laboratory features at the onset with an adult population sample with AP. Moreover, we analyzed admission parameters predicting a severe course of AP.

2. Materials and methods

2.1. Patients, inclusion and exclusion criteria

All patients aging >65 years old (range 65–102) admitted to our Gastroenterology Unit for AP in the period April 2012–April 2015 were retrospectively recruited from our database. These patients constituted the elderly group, according to a conventional cut-off [11]. Subjects younger than 65 years (range 19–64 years) admitted to our Unit for AP represented the control group. The diagnosis of AP was performed according to the revised Atlanta classification [3], requiring two of the three following criteria: abdominal pain, serum lipase activity more than three times than the upper limit of normal and peculiar findings at abdominal imaging. Also the severity of AP was determined according to the abovementioned Atlanta classification. Organ failure was defined as stated by Marshall et al. [16], i.e. by evaluating arterial oxygen tension levels (PaO2)/fraction of inspired oxygen (FiO2) ratio, platelet count, serum bilirubin, heart rate, Glasgow coma scale, and serum creatinine. Moreover, for each patient, the Ransom score was determined [17], which represents a system to predict the severity of acute pancreatitis. It encloses multiple parameters evaluated at hospital admission (age in years, white blood cell count, blood glucose, serum aspartate transaminase, serum lactate dehydrogenase) and after 48 hours (serum calcium, hematocrit, blood oxygen PaO2, variations in urea nitrogen, base deficit and entity of sequestration of fluids). In agreement with Kim et al. [11], we excluded the patients who had chronic pancreatitis with acute relapse.

2.2. Data collection

For each patient, the following laboratory examinations at the admission were collected: glycemia, full blood count, serum calcium, creatinine, pancreatic isoamylase, lipase, aspartate transaminase (AST), alanine transaminase (ALT), gamma glutamyl-transpeptidase (GGT), lactate dehydrogenase (LDH), C-reactive protein (CRP), and triglycerides and total cholesterol. Polypharmacy was defined when the patient assumed ≥3 drugs. Hospital duration was further calculated. For each patient, the Ransom score was determined [17]. Co-morbidity (cardiovascular, pulmonary, renal or diabetes) was derived from clinical history.

All patients underwent abdominal imaging (ultrasonography and computed tomography – CT – according to the severity).

The etiology was defined as biliary if gallstones or sludge was found. Alcoholic AP was considered if the patient had consumed more than 40 g ethanol per day (20 g in female) for at least 5 years or if the patient had consumed an excessive alcohol amount shortly before the onset of the disease (more than five standard drinks/60 g) [11,18]. A serum triglyceride level more than 1000 mg/dl and exclusion of other etiologies were accepted as the hyperlipidemic etiology [11].

2.3. Statistical analysis

Continuous data were provided as mean ± standard deviations, categorical variables as percentages. In univariate analysis, comparison between continuous variables was performed by Student's t test, while Fisher's exact test was used for categorical variables. ANOVA and Bonferroni's post-hoc analysis were employed for multiple comparisons. Pearson's test was used to quantify the correlation between two variables.

For multivariate analysis, multinomial logistic regression was used to determine which factors could have influenced the severity of AP. Then, the severity of AP, according to revised Atlanta classification, was considered as dependant variable, while all other parameters as independent ones. Variables which were statistically significant at univariate analysis were considered for multivariate analysis, and odd ratios (OR) and 95% confidence intervals (95% CI) were calculated. All statistical tests were 2-tailed and performed at the 5% level of significance. The statistical analysis was performed using the software SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.

3. Results

Ninety/118 patients were selected for the present study according to inclusion and exclusion criteria, 42 (male/female ratio: 22/20) belonging to the elderly group (aging 78.1 ± 10.1, range 65–102) and 48 (male/female ratio: 26/22) to the control group (age 45.1 ± 10.9, range 19–64), as shown in the flowchart reported in Fig. 1.

Patients with post-endoscopic retrograde cholangiopancreatography (ERCP) AP, pancreatic cancer, including intraductal papillary mucinous neoplasms and mucinous cystic neoplasms, were excluded since they were observed only in the elderly group, as well as genetic, recurrent pancreatitis and AP linked to pancreas divisum were excluded from the analysis, because they were observed only in the control group. Therefore, we decided not to enclose such patients (28 in total) due to the non-homogeneous distribution in the two groups (Fig. 1). We did not report any case of AP due to hypertriglyceridemia in our series.

At onset, elderly patients were consuming more drugs than controls (85.7% vs 45.8%; $p = 0.006$), and had higher rates of cardiovascular (76.2% vs 37.5%; $p = 0.0003$), pulmonary (28.6% vs 0%; $p = 0.0001$) and renal (9.5% vs 0%; $p = 0.04$) co-morbidities.

Elderly patients showed a more severe Atlanta score for AP (1.81 ± 0.75 vs 1.29 ± 0.46; $p = 0.007$), as well as a higher Ransom score (2.52 ± 1.57 vs 0.75 ± 0.73; $p < 0.0001$) than controls. We found a direct correlation between these two score systems, both in the elderly ($r = 0.73$, 95% CI 0.43 to 0.88; $p = 0.0002$) and in the control group ($r = 0.73$, 95% CI 0.46 to 0.87; $p < 0.0001$). Scatterplots of correlation analysis are reported in Fig. 2.

With regard to complications, no death was recorded in the elderly as well as in the control group. Moreover, we observed only one case of fluid necrosis in a patient in the elderly group with a severe form of AP. CT scan demonstrated non-necrotic fluid collections in seventeen cases (40.5%) of the elderly group and only in six cases (12.5%) in the control group ($p = 0.003$). Finally, a single case of pseudocyst was observed in control group.

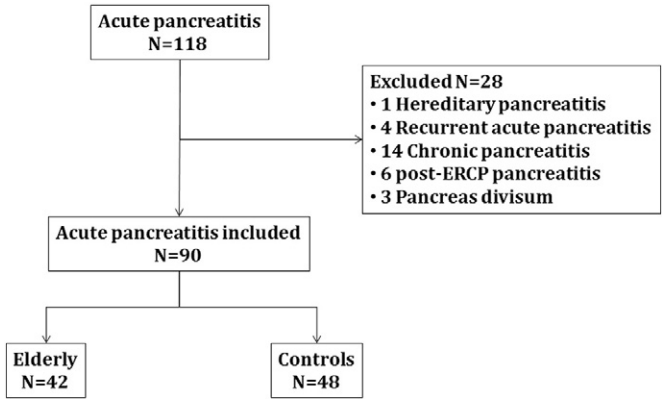

Fig. 1. Flow diagram illustrating the process of patients' selection according to inclusion and exclusion criteria.