The revised Atlanta criteria 2012 altered the classification, severity assessment and management of acute pancreatitis

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BACKGROUND: The Atlanta criteria for acute pancreatitis (AP) has been revised recently. This study was to evaluate its practical value in classification of AP, the severity assessment and management.

METHODS: The clinical features, severity classification, outcome and risk factors for mortality of 3212 AP patients who had been admitted in Ruijin Hospital from 2004 to 2011 were analyzed based on the revised Atlanta criteria (RAC) and the original Atlanta criteria (OAC).

RESULTS: Compared to the OAC group, the incidence of severe acute pancreatitis (SAP) was decreased by approximately one half (13.9% vs 28.2%) in the RAC group. The RAC presented a lower sensitivity but higher specificity, and its predictive value for severity and poor outcome was higher than those of the OAC. The proportion of SAP diagnosis and ICU admission in the early phase in the RAC group was significantly lower than that in the OAC group (*P*<0.05). Based on the RAC, the risk factors for death among SAP patients were older age, high CT severity index (CTSI), renal failure, cardiovascular failure, acute necrotic collection and walled-off necrosis. Compared to the OAC, the acute physiology and chronic health evaluation II (APACHE II) score, Ranson score, idiopathic etiology, respiratory failure and laparotomy debridement were not risk factors of death in contrast to walled-off necrosis. Interest-ingly, hypertriglyceridemia-related SAP had good outcomes in both groups.

CONCLUSIONS: The RAC showed a higher predictive value for severity and poorer outcome than the OAC. However, the RAC resulted in fewer ICU admissions in the early phase due to its lower sensitivity for diagnosis of SAP. Among SAP cases, older age, high CTSI, renal and cardiovascular failure, complications of acute necrotic collection and walled-off necrosis were independent risk factors for mortality.

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KEY WORDS: acute pancreatitis;
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Introduction

Acute pancreatitis (AP) varies in clinical manifestations, etiologies, and severity. Upper abdominal pain, nausea and vomiting are typical symptoms at onset, with the spectrum of the disease ranging from a mild self-limiting to a severe complicated course with multiple organ dysfunction and death.[1] The original Atlanta criteria (OAC) for AP classification and definition have been universally applied since 1992.[2] This system aimed to gain uniformity in the assessment of clinical severity and various complications of AP. For the past 20 years, this was the only widely accepted classification system used by clinicians and radiologists. However, many clinicians noticed the limitation of OAC and they realized that the OAC needs to be revised.[3-7] Questions were mainly focused on the nonconformity between the diagnostic criteria of severe acute pancreatitis (SAP) and real severity and outcome.[8, 9] The revised Atlanta criteria-2012 (RAC) was published recently.[10] The severity

of AP was classified as mild (MAP), moderately severe (MSAP) or severe (SAP). Local complications were also defined as acute peripancreatic fluid collections (APFC), acute pancreatic and peripancreatic necrosis (ANC), pancreatic pseudocyst (PPC) and walled-off necrosis (WON). These revisions received favorable responses from clinicians and radiologists. However, further evaluation is still needed before it is universally accepted.

Here, we analyzed the etiologies, clinical features and outcomes of patients with first-attack AP using the RAC system. In addition, we also compared the advantages and disadvantages between the RAC and OAC system.

Methods

Patient enrollment

We retrospectively analyzed the data from 3212 patients with AP who had been admitted within 72 hours after onset of symptoms in Departments of Emergency, Gastroenterology, Surgery and Intensive Care Unit (ICU) in Ruijin Hospital (Shanghai, China) from January 2004 to December 2011. To ensure the inclusion of only eligible patients with first-attack of AP, patients with recurrent AP, chronic pancreatitis or pancreatic cancer were excluded. Patients with incomplete data (e.g., deceased within 24 hours after admission, missing Ranson scores, missing computed tomography (CT) diagnosis, or termination of treatment on halfway) were also excluded. Demographic and clinical characteristics of the patients were collected at the time of admission.

Diagnosis and classification of AP

According to the RAC system, the diagnosis of AP requires two of these features: onset of upper abdominal pain, serum lipase or amylase level at least three times higher than the normal upper limit, diagnosed by imaging techniques such as contrast-enhanced CT, ultrasonography (US) and/or magnetic resonance imaging scan.[10] Severity of AP was classified as MAP, MSAP or SAP in the RAC system. MAP is the most common form of AP which involves no organ failure, local or systemic complications and usually resolves in the first week. MSAP is defined as the presence of transient organ failure, local complications or exacerbation of comorbid disease. SAP is defined as persistent organ failure (> 48 hours) affecting respiration, renal function or the cardiovascular system. Local complications were defined as APFC, ANC, PPC and WON. In the OAC system, the severity of AP was classified as MAP and SAP.[2] The SAP diagnosis requires at least one of the following criteria: (a) APACHE II score ≥8; (b) Ranson score ≥3; (c) organ failure (i.e., transient and persistent); and (d) local complications (i.e., necrosis, abscess or pseudocyst).

Etiologies

The etiology was considered to be of biliary origin when biliary tract stones were detected by US, CT or magnetic resonance cholangiopancreatography (MRCP), endoscopic retrograde cholangiopancreatography (ERCP), or operation without other probable causes. Alcohol was considered to be an etiological factor if there was either consumption of more than 80 g/d for more than 5 years or presence of social or weekend abuse. For pancreatitis due to hypertriglyceridemia (HTG), a serum triglyceride (TG) level of more than 1000 mg/dL or 500-1000 mg/dL with a history of HTG was necessary, in addition to exclusion of other triggers.[2, 11, 12] Lacking any of the above evidence or other direct causes, any unexplained pancreatitis was defined as idiopathic AP. Other etiologies, such as alcoholic, sphincter of Oddi dysfunction, pregnancy associated, iatrogenic injury, abdominal trauma, pancreatic duct obstruction, pancreas divisum, ampullary obstruction, hyper-calcemia, drugs related and autoimmune, were defined as "others" in this study.

Statistical analysis

SPSS 17.0 software (SPSS Inc., Chicago, IL, USA) was used for data analysis. The distributions of quantitative variables were tested. Normally and non-normally distributed quantitative variables were presented as the mean±standard deviation and mean, respectively. Continuous variables were compared between the groups using an unpaired t-test and a paired t-test within each group. Categorical variables were compared using the Chi-square test. For small samples, analysis of variance and Fisher's exact test were used to analyze continuous and categorical variables as appropriate. Statistical significance was set at $P<0.05$.

Results

Etiologies and clinical characteristics

A total of 3212 patients (1825 males and 1387 females) with first-attack AP were included in this study. The median age of the patients was 54 years (range 41-67). The causes of first-attack AP were biliary diseases (2012/3212, 62.6%), HTG (431/3212, 13.4%), idiopathic (393/3212, 12.2%) and others (376/3212, 11.7%). Overall, 1577 (49.1%) of these patients underwent operations, 1317 (41.0%) followed by ERCP/cholecystectomy and 267 (8.3%) by laparotomy debridement. One hundred and forty-nine (4.6%) patients were deceased. The average