

# Characteristics of Patients Diagnosed With Acute Pancreatitis Treated Between January 2008 and December 2011 at a Fourth Level Medical Center

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## Abstract

**Introduction:** Acute pancreatitis (AP) is a frequent reason for patients to consult with physicians and is a condition that is often associated with significant morbidity and mortality. Since little information has been published on the clinical characteristics of AP in Colombia, we consider it important to establish the demographic and clinical characteristics of patients as well as the types of treatment received and the outcomes of patients with AP at a fourth level hospital.

**Methods:** This is a cross-sectional study based on a review of the medical histories of adult patients with AP who were hospitalized between January 2008 and December 2011.

**Results:** The study included 222 patients 60% of whom were women. Their mean age was 52 years. The most frequent symptoms were abdominal pain (99%), vomiting (65%) and jaundice (13%). The clinical characteristics of 99% of these patients were compatible with AP. Enzymatic alterations were found in 96% of the cases and imaging criteria were needed to confirm the diagnosis in only 7% of the cases. Biliary etiology was the most common (67% of cases), and only 6% had alcoholic etiology. Severe AP was diagnosed in 63% of the patients. 32% required intensive care, 10% of patients required vasopressor support, and overall mortality was 4%.

**Conclusion:** The clinical, demographic and etiological characteristics of these patients were similar to those described in other series from medical centers of similar complexity. Nevertheless, the percentage of patients with severe AP was high which may have been due to the relatively low specificity of the staging used. Despite this high percentage severe cases, overall mortality was not high. Since severe cases require specific therapeutic interventions, it might be useful to define classification criteria that are more useful in our population.

## Keywords

Acute pancreatitis, severity, mortality.

## INTRODUCTION

Acute pancreatitis (AP) is a common cause of abdominal pain which causes the hospitalization of 220,000 patients in the United States every year (1). It has an impact on between five and forty of every 100,000 people in the USA (2). Similarly, due to associated complications, AP is a disease that generates high costs for health care systems (3).

The disease occurs with similar frequencies among different age groups. Etiology and risk of complications

including death depend on factors such as gender, race, body mass index and age. In Europe AP due to gallstones accounts for 11% to 56% of all cases. Eight percent to 44% of cases are considered to be idiopathic, and three percent to 66% are associated with alcohol (4). The average age at presentation of biliary pancreatitis is age 60, and AP is more common among women than among men (5). It has been found that these figures vary geographically. Although, there are no data on the prevalence or incidence of the disease in Colombia, the experience of some centers

indicates biliary etiologies account for 80% of cases, alcoholic etiologies for 9%, trauma for 5%, hypercalcemia for 4%, and ascariasis for 1.3%. The cause can be identified in 75% to 80% of cases (6).

Cases of AP have been reported more frequently in recent years (4, 7, 8). One explanation is that AP is the most frequently found cause of abdominal pain in emergency room patients. Another explanation is the higher incidence of gallstones and obesity in the general population. It is considered that up to 20% of AP patients develop a severe case and that 10% to 25% of the patients with severe AP die (9, 10). Although the fatality associated with AP has diminished from 20% to 5% today, the mortality rate in severe cases has not changed despite many advances in the management of the disease. This confirms the importance of early detection of patients with potentially severe cases so that early intervention can change the prognosis (9). Several management guidelines for AP have been developed on the basis of high quality evidence and expert advice, but studies have shown suboptimal adherence to these recommendations in the various centers evaluated (11-14).

Given that the AP is a common complaint, that associated morbidity and mortality are not negligible, and that management of AP can impact outcomes, we consider it important to determine the epidemiological characteristics, type of management established and outcomes for patients have been diagnosed with AP at Hospital San Ignacio in Bogota.

## MATERIALS AND METHODS

The electronic medical records system of Hospital San Ignacio, a hospital of fourth level, were used to compile a list of 963 patients who had been diagnosed with primary and secondary AP from January 2008 to December 2011. Diagnoses were based on ICD-10 (10th revision of the International Statistical Classification of Diseases and Related Health Problems) criteria for acute pancreatitis. All patients over the age of 16 years who had been diagnosed with acute pancreatitis in the emergency services, hospital, or intensive care unit and who had not been referred to another facility were included in the study. In total, 222 cases were included and 741 were excluded for various reasons (Figure 1). The primary objective of the study was to determine demographic and clinical characteristics, types of treatments received, and patient outcomes. Secondary objectives included establishing the methods used for diagnosis of AP and prediction of severity of different scales and variables in this population. Predictions were made using Prevalence Odds Ratios. The research protocol was approved by consensus by the Research and Ethics Committee of the hospital. Following approval, data on the variables previously proposed were collected and subsequently analyzed using STATA.

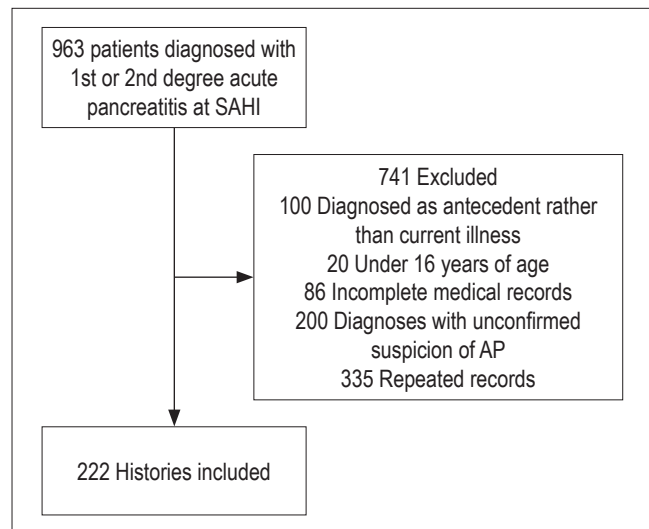


Figure 1. Process for clinical histories selection.

## RESULTS

### Basic features and Diagnosis

The average age of the patients studied was 52 years with an age range of 16 to 92 years. Sixty percent were women, 40% were men, and 58% had comorbidities. The most frequent comorbidities were cardiovascular and endocrine. The most common symptoms were abdominal pain, vomiting and jaundice. Less common were dark urine, acholia and fever (See Table 1).

Usually clinical and biochemical criteria were used to diagnose AP in these patients. Amylase was the most widely used biochemical method, but several patients required the use of lipase as an additional diagnostic method. Only 7% of cases required the help of an imaging method to make the diagnosis of AP. The most common cause of AP in our study was biliary. Alcoholic origins were rare. A large group of patients were classified as idiopathic (17%). Other less common causes included endoscopic retrograde cholangiopancreatography (ERCP), drugs, hypertriglyceridemia and neoplasms (See Table 2).

### TREATMENT

In this study, most patients were observed in either the general hospital ward or the emergency department, but 32% required observation in the intensive care unit (ICU) at some point. Standard management of patients included bolus infusions of intravenous fluids. The average was 979 cc, but some patients required up to 3000 cc. Pain was managed with opioids in most cases, and some patients also received anti-inflammatory drugs (NSAIDs) and antispasmodic

hyoscine butyl bromide. Most patients were able to receive nutrition within five to seven days. A small group of patients required enteral nutrition (nasogastric or nasojejunal) and parenteral nutrition. Among these patients, 33% received some type of antibiotic treatment. In most cases (25%) it was prescribed after biliary obstruction was suspected, but in 8% of the cases it was prescribed for suspected pancreatic super-infections. Forty-six percent underwent cholecystectomies and 14 (6%) patients required surgical exploration due to superinfected necrosis (See Table 3).

**Table 1.** Demographic Characteristics

Parameters	n = 222 patients
Age (years)	
Average -- No (95% CI)*	52.9 (50.3-55.5)
Gender -- No (%)	
Masculine	89 (40)
Feminine	133 (60)
Comorbidities - No (%)	
Without comorbidities	93 (42)
Cardiovascular	86 (39)
Endocrine	86 (39)
Pulmonary	20 (9)
Cancer	15 (7)
Symptoms -- No (%)	
Abdominal pain	219 (99)
Vomiting	144 (65)
Jaundice	29 (13)
Others	47 (21)

\*95% confidence interval

**Table 2.** Diagnoses

Parameters	n = 222 patients
Method -- No (%)	
Clinical	219 (99)
Chemistry	213 (96)
Amylase	213 (96)
Lipase	100 (46)
Imaging	15 (7)
Etiologies -- No (%)	
Biliary	149 (67)
Alcoholic	13 (6)
Idiopathic	38 (17)
Others*	18 (8)
Metabolic <sup>o</sup>	2 (1)

\* Post ERCP, Neoplasia

<sup>o</sup> Hypertriglyceridemia

**Table 3.** Staging and Outcomes

Parameters	n = 222 patients
Hospital Ward -- No (%)	
General	68
ICU	32
Initial bolus of liquids (cc)	
Average -- No (IC 95%)*	979,9 (889,8-1070)
Analgesia -- No (%)	
Opiates	161 (72)
Antispasmodics	13 (5)
NSAIDS	13 (5)
None	36 (16)
ERCP -- No (%)	65 (30)
Antibiotics -- No (%)	75 (33)
Type of nutrition -- No (%)	
Oral	191 (86)
Enteral	2 (9)
Parenteral	2 (9)
Time to start of oral feeding in days-Median (IQR) <sup>o</sup>	5 (4-7)
Surgery (%)	
Cholecystectomy	102 (46)
Surgery for necrosis	14 (6)

\* 95% confidence interval

<sup>o</sup> Interquartile Range

## STAGING AND OUTCOMES

Of the 222 patients analyzed, a large group had severe AP. The 1992 Atlanta criteria were used to defining severity. Criteria include hypoxemia, gastrointestinal bleeding, acute kidney injury, shock, Ranson score greater than or equal to three and Apache-II score greater than or equal to eight. Seventeen percent of patients had local complications including the six percent who were diagnosed with superinfected necrosis. Some patients were in shock, and 10% of the total analyzed required vasopressor support. During hospitalization, nine patients died (Table 4).

## DISCUSSION

AP commonly causes abdominal pain resulting in emergency consultations which have high rates morbidity and high associated costs. Multiple studies have described geographical differences in prevalence, etiology, and complication rates. In our study, we found patient demographics and the diagnostic methods used are similar to those reported in other series. We found that 67% of our cases had biliary causes, 17% were idiopathic, and 6% were associated with alcohol. Our results differ from those published by first

world countries where the prevalence of AP due to biliary etiologies is 40%, and AP associated with alcohol is 35%. Similarly, if these results are compared with those of a study at the the Fundación Santa Fe de Bogota conducted several years ago in which biliary etiologies accounted for 80% of the cases, one might conclude that many of the cases diagnosed as idiopathic AP in our study might really be biliary microlithiasis. Nevertheless, given the limitations on the use of advanced diagnostic methods such as endoscopic ultrasound in the same hospital, many etiologies could not be clearly diagnosed.

**Table 4.** Staging and Outcomes

Parameters	n = 222 patients
Severity – No (%)	
Slight	81 (37)
Severe	141 (63)
Severity due to – No (%)	
Hypoxemia*	97 (68)
Local Complication	24 (17)
Shock°	19 (13)
Acute renal failure?	14 (9)
Ranson score▪	89 (62)
Apache-II score*	78 (55)
Use of vasopressor (%)	22 (10)
Necrosis (%)	13 (6)
Mortality -- No (%)	9 (4)

\* PaO<sub>2</sub> < 60 mmHg

° Systolic arterial pressure less than 90 mmHg

‡ Creatinine over 2 mg/dl

▪ Three or more points

\* Acute Physiology and Chronic Health Evaluation of eight or more

We found that 63% of these cases were severe which is well above the rates reported in other series of 18% to 20%. Since our patients had a low mortality rate and few cases of shock or need for hemodynamic support, there is a possibility that we overestimated severity. We believe that the high prevalence of cases of severe AP may have two explanations. The first is simply the context of a fourth-level hospital receiving complex patients, many of whom were referred to the emergency room or ICU for endoscopic or surgical procedures that are not available in other institutions. The second is the degree of overestimation and strict use of severity scales in studies of other populations. It is worth noting that in our study 68% of the AP cases were classified as severe using the criterion of hypoxemia, 62% by Ranson scores and 55% by Apache-II scores.

Considering that shock and death are consequences of severe AP and reflect critical courses of development, we

used prevalence odds ratios to relate scales of severity (See Tables 5 and 6) and found that CT severity index (CTSI) scores of over six, acute renal failure, digestive tract bleeding and local complications were correlated with a severe course of development of the disease. In contrast, variables such as age, Apache-II scores, Ranson scores and hypoxemia which have been recently proposed as criteria to define severity did not correlate with severe development of AP.

**Table 5.** Prevalence Odds Ratios for predicting shock

Variable	n	Results (95% CI) *
Age over 65	8	1,0 (0,32-2,9)
IS 1-4 °	3	0,14 (0,02-0,7)
IS 5-6 °	2	1,0 (0,09-5,7)
<b>IS a 6 °</b>	<b>6</b>	<b>12,1 (2,3-62,9)</b>
<b>Acute Renal Failure?</b>	<b>8</b>	<b>14,0 (3,4-57,5)</b>
Hypoxemia (PaO <sub>2</sub> < 60 mmHg)	17	4,4 (0,9-41,3)
<b>Digestive tract bleeding ▪</b>	<b>4</b>	<b>16 (2,0- 183,8)</b>
<b>Local Complication</b>	<b>8</b>	<b>4,8 (1,4-15,3)</b>
Ranson score of 3 or more	11	1,3 (0,4-4,0)
APACHE-II score of 8 or more	14	2,5 (0,79-9,5)

\*95% confidence interval

° CT severity index

‡ Creatinine over 2 mg/dl

▪ 500 ml in 24 hours

**Table 6.** Prevalence Odds Ratios for predicting death

Variable	n	Results (95% CI) *
Age over 65	4	1,3 (0,28-5,62)
IS 1-4 °	2	0,14 (0,01-0,93)
IS 5-6 °	2	2,2 (0,19-14,8)
IS a 6 °	3	7,0 (0,8-47,1)
<b>Acute Renal Failure?</b>	<b>5</b>	<b>11,2 (2,1-52,9)</b>
Hypoxemia (PaO <sub>2</sub> < 60 mmHg)	8	1,2 (0,27-7,54)
<b>Digestive tract bleeding ▪</b>	<b>4</b>	<b>16 (2,0-183,8)</b>
<b>Local Complication</b>	<b>5</b>	<b>4,8 (1,0-21,0)</b>
Ranson score of 3 or more	6	1,1 (0,26-4,8)
APACHE-II score of 8 or more	9	3,9 (0,7-38,9)

\*95% confidence interval

° CT severity index

‡ Creatinine over 2 mg/dl

▪ 500 ml in 24 hours

These results could be explained by the small number of patients who suffered and/or died. A larger sample may be required to reach more valid conclusions. In any case, we do not yet know the limitations of PaO<sub>2</sub> levels as a marker of hypoxia in our population which lives at 2,400 meters

above sea level. Partial pressure of oxygen in arterial blood varies at different altitudes above sea level, the level for which severity scales have been designed. Another explanation for the presence of hypoxemia is cardiovascular and pulmonary comorbidities in our patients and underlying conditions that could alter PaO<sub>2</sub> levels. Since the Ranson and Apache-II scales also failed to predict shock and death, we wanted to define the index of correlation between them. We found that Kappa = 0.0252 which reflects an insignificant correlation between the two scales as predictors of severity in this study. These scales should be validated in our community before we can determine more effectively how well they predict severe development of AP. We believe it is vitally important to be able to predict severe courses of AP more accurately to avoid unnecessary interventions and costs.

While this study is descriptive and its analyses cannot establish causality between the variables studied, it opens doors for prospective studies in which clinical variables, paraclinical variables, and scales can be validated as to the quality of their predictions of severity in our population so that we can truly define the prognosis and type of treatment needed for each patient who has acute pancreatitis.

### Conflicts of interest

The authors declare that there was no special funding for this work and the authors have no conflicts of interest.

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