Original research article

BISAP clinical rating and clinical outcome compared to CT-based pancreatitis severity evaluation: A prospective observational study

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Abstract

Background and Objectives: This research aims to classify patients with acute pancreatitis into interstitial edematous pancreatitis and necrotizing pancreatitis using the updated Atlanta classification and to describe the types of collections found in these patients using contrast-enhanced computed tomography.

Materials and Methods: This was hospital-based prospective observational research. The study period began June 2022 to May 2023, conducted at the Department of Radio Diagnosis, General Medicine, General Surgery at Chettinad Hospital and Research Institute, Kelambakkam, Tamil Nadu. 100 patients made up the study's sample size. The researcher gathered primary data from individuals hospitalized to the surgery or medicine wards with the diagnosis of acute pancreatitis.

Results: The study cohort consisted of male patients, with Alcohol consumption identified as the predominant etiological factor contributing to their medical state. Furthermore, the prevalence of interstitial edematous pancreatitis and mild acute pancreatitis was found to be significantly higher in the majority of patients. Both acute necrotizing pancreatitis and interstitial edema were categorized as quite severe. Necrotizing pancreatitis emerged as the predominant manifestation of the highly severe acute variant. The majority of these people experienced unfavorable clinical results. Grades falling within the moderately severe range are situated between those classified as mild and severe.

Conclusion: The new Atlanta classification system makes it easier to describe and document imaging findings in cases of acute pancreatitis in clinical settings. The revised Atlanta classification and BISAP clinical grading have been integrated to improve the triage, prediction, and treatment of patients with acute pancreatitis.

Keywords: Atlanta categorization, BISAP, clinical grade, and pancreatitis severity

Introduction

Inflammatory and rapidly spreading Acute Pancreatitis can affect the pancreatic, surrounding retroperitoneal tissues, and even other organs and systems. Symptoms of Acute Pancreatitis range from mild, such nausea and vomiting, to severe, like multi-organ failure, renal failure, acute respiratory distress syndrome, and death [1, 2]. Alcoholism and biliary system problems are the most common triggers for acute pancreatitis. Mechanical obstruction, pancreatitis caused by endoscopic retrograde cholangiopancreatography, congenital anomalies such pancreatic divisum, and a wide variety of other pathological illnesses are all potential causes of pancreatic dysfunction. Acute pancreatitis has an extremely low fatality rate, hovering around 1% to 2%. However, in the most severe cases, the death rate increases dramatically, from 10% to 30% [3-5].

Severe pancreatitis is a common cause of severe abdominal pain and is characterized by a highly variable clinical course. Classification of Acute Pancreatitis (AP) patients shows that 80% fall into the intermediate category, while 20% are considered to have severe cases. The oedematous form corresponds to less severe cases of AP, while the necrotizing form is associated with more severe cases. The mild form of the disorder is characterized by self-limitation and has only mild effects on physical functioning. Superimposed infection and various organ dysfunction syndrome can have fatal results in the severe form of the disease [6-8].

The most reliable method for detecting necrosis and fluid accumulation in acute pancreatitis is contrast-enhanced computed tomography of the abdomen. The results of this diagnostic test are crucial in

establishing a prognosis, directing treatment, and minimizing adverse outcomes. Computed tomography (CT) has been shown in multiple trials to be useful for observing necrosis and consequences of acute pancreatitis in real time. Since AP severity can be difficult to quantify, CT provides a more reliable assessment than numerical grading methods [7-9]. Multiple studies have shown that the CT severity index is positively correlated with acute pancreatitis severity. However, various researches have looked into the limitations of this correlation. There is no link between CSI and mortality, the requirement for surgery or percutaneous intervention, the Modified Rankin Scale, or superadded infection [8-10]. The purpose of this research was to evaluate the accuracy of the BISAP clinical scoring system in grading the severity of pancreatitis by computed tomography in comparison to the Revised Atlanta classification.

Materials and Methods

This was hospital-based prospective observational research. The study period began June 2022 to May 2023, conducted at the Department of Radio Diagnosis, General Medicine, General Surgery at Chettinad Hospital and Research Institute, Kelambakkam, Tamil Nadu. 100 patients made up the study's sample size. The researcher gathered primary data from individuals hospitalized to the surgery or medicine wards with the diagnosis of acute pancreatitis.

Inclusion criteria
- Abdominal computed tomography was done on all patients.

Exclusion criteria
- Pregnant women.
- Patients who are allergic.
- Patients under the age of 18.

Results

100 patients who were diagnosed with acute pancreatitis based on clinical criteria and transabdominal ultrasonography. These patients were monitored until their conditions were resolved, whether by conservative means or through intervention.

Table 1: Age wise patient's distribution

Sr. No.	Age in Years	Patients
1.	< 20	2
2.	21-30	28
3.	31-40	20
4.	41-50	30
5.	51-60	18
6.	> 60	2

The minimum age for patients to take part is 18. Twenty people in the study were in the 31-40 age range. There were 28 patients in the 21-30 age range, 30 in the 41-50 Range, and 18 in the 51-60 range.

Table 2: Sex wise patient distribution

Sr. No.	Sex	Patients
1.	Male	80
2.	Female	20

The study included 100 people, 20 of them were female. The remaining 80 were all Men. This data demonstrates that males are more likely to experience acute pancreatitis than females.

Table 3: Cause of Pancreatitis

Sr. No.	Pancreatitis Causes	Patients
1.	Alcohol	62
2.	Gall Stone	18
3.	Idiopathic	12
4.	Trauma	08

Sixty-two patients in the research population had acute pancreatitis due to alcohol consumption, while gallstones accounted for 18 patients, trauma accounted for 8 patients, and idiopathic accounted for 12 patients.

Table 4: Organ Failure observation

Sr. No.	Organ Failure	Patients

| 1. | Present | 29 |
| 2. | Absent | 71 |

A total of 100 patients were enrolled in this study; among them, 71 showed no symptoms of organ failure. The remaining 29 patients did.

Table 5: Mortality rate of the patients

Sr. No.	Mortality	Patients
1.	Alive	88
2.	Death	12

The clinical outcome of the patient cohort showed that twelve patients died out of a total of one hundred.

Discussion

With the recently revised Atlanta classification, acute pancreatitis patients can be more correctly recognized and triaged, leading to more efficient treatment and improved outcomes. Acute pancreatitis patients are less likely to die from their condition and experience fewer complications if their severity can be predicted in advance. A similar user-friendly, widely available, and reliable system for evaluating patients with acute pancreatitis is the BISAP clinical grading. Acute pancreatitis patients can be better diagnosed and managed with the help of scoring systems like BISAP, but few studies have compared this classification to clinical scoring systems like these [11, 12].

Acute pancreatitis patients are classified and graded using contrast-enhanced computed tomography according to the Revised Atlanta classification of pancreatitis. Each of these individuals was assigned a BISAP score. Patients were monitored for mortality, the development of persistent organ failure, the appearance of infections, the need for intervention, and the duration of their hospital stays [13-15]. Sixty two patients in the study group had acute pancreatitis caused by alcohol use, eighteen had gallstones, eight had acute pancreatitis caused by trauma, and twelve had idiopathic pancreatitis. These findings demonstrated that alcohol misuse is a significant risk factor for developing acute pancreatitis in the cohort we studied. When it comes to female patients, gallstones are by far the most common culprit [16-18].

Necrotizing pancreatitis affected about 18 people. MW Freeman *et al.* found that necrotizing pancreatitis makes up 15% of all cases of acute pancreatitis. 47 Patients had moderate to Acute Severe type. According to the revised Atlanta categorization, 9 of these 47 patients had severe acute pancreatitis, while the rest 38 were classified as having moderate to severe pancreatitis. A higher severity grade for acute pancreatitis is related with necrotizing pancreatitis [19-21]. Organ failure was a problem for 29 of the 100 patients. There were 29 cases of deteriorating respiratory or renal or cardiovascular function including a small number of cases of multi-organ failure. This organ failure was scored using the Marshall scale. There were 16 cases of chronic organ failure and 13 cases of transient failure among these patients [22-25]. Of the 47 patients diagnosed with moderate to severe acute pancreatitis, 37 had a BISAP score of 3 or below, while 10 had a score of 3 or above. 7 of the 9 patients with severe acute pancreatitis had a BISAP score of 3 or above, while just 2 had a score of 3 or lower. The severity of pancreatitis, as defined by the Revised Atlanta classification, is mirrored in the patient's BISAP score. Thus, it was discovered that the BISAP clinical grading system correlates well with the Revised Atlanta severities [25, 26].

In clinical outcome analysis, the death rate is a primary metric. Eight of the twelve fatalities have been linked to acute necrotizing pancreatic and peripancreatic collection, under the revised Atlanta classification. They were all classified as "severe acute" by the RAC. Death among this population was primarily caused by sepsis, infection, respiratory failure, and shock. Each of them had a BISAP score of 3 or higher. According to the revised Atlanta classification, Rest 4 were found to have interstitial edematous pancreatitis with peripancreatic fluid buildup. Their acute pancreatitis was quite severe, even by the norms of the most recent Atlanta classification. These patients typically died from shock and circulatory failure. On the BISAP scale, three of them scored at least a 3, with only one scoring below [27].

Patients with interstitial edematous pancreatitis were discharged from the hospital earlier than those with necrotizing pancreatitis. In the clinical outcome analysis, 23 patients were found to show evidence of infection. According to the most recent Atlanta categorization [27], about as many people experienced severe acute as moderately severe acute pancreatitis. In addition, 18 of these individuals were diagnosed with acute necrotizing pancreatitis. Infection is more common in those with acute necrotizing pancreatitis, as well as those with severe and moderately severe acute pancreatitis. The BISAP scores of 12 of the 23 afflicted people were at least 3, while 11 had values at or below 2 [28, 29].

After 6 weeks, after the inflammation has subsided, 33 patients needed elective surgery for pseudocyst, either cystogastrostomy or cystojejunostomy. Rare circumstances called for open draining of massive collections, clipping of a pseudo aneurysm, or necrosectomy. Of these 33 patients, 10 were diagnosed

with mild acute pancreatitis, with the majority requiring a cystogastrostomy or cystojejunostomy due to pancreatic pseudocysts. Of these 33 Patients, in 14 patients with mild to moderate acute pancreatitis and 9 patients with severe acute pancreatitis, percutaneous drainage was necessary due to the presence of acute necrotizing pancreatic and peripancreatic collection. The BISAP scores of 10 of these 33 individuals were at or above 3, while those of the remaining 23 were at or below 2. We can conclude that both Revised Atlanta classification grading and BISAP scoring are good predictors of need for intervention in acute necrotizing pancreatitis [28-30], as many of these patients fall into moderate acute grades and require only elective intervention in the later course of disease.

Conclusion

The new Atlanta classification system enables a more standardized and comprehensive description and documentation of imaging findings in cases of acute pancreatitis within clinical settings. The BISAP score is a solid and uncomplicated approach for the early prediction of mortality risk in cases with acute pancreatitis. The combined utilization of these two robust radiological and clinical instruments significantly enhances the accuracy in the triage, prediction, and treatment of individuals suffering from acute pancreatitis.

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Conflict of Interest: None.

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