

D-Dimer in the Prognosis of Acute Pancreatitis

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Abstract

Introduction: Acute pancreatitis has always represented a medical challenge because of its complexity according to severity; thus, several tools have been proposed to more accurately determine whether we are facing a mild versus a moderate or severe pancreatitis. Consequently, in recent years, the BISAP (Bedside Index of Severe in Acute Pancreatitis) scoring system has been used as a highly sensitive tool to determine the severity of acute pancreatitis.

Objective: This study will determine that a D-dimer marker greater than 0.5 ug/dL is highly sensitive in the identification of a moderate or severe pancreatitis in relation to a BISAP score.

Methodology: An epidemiological analytic cross-sectional time-period design study was carried out. Sixty patients admitted to the Hospital Eugenio Espejo with an acute pancreatitis diagnosis were evaluated and were submitted to the BISAP scoring system and the D-Dimer test 24 and 48 hours after admission.

Results: The results found included the observation that the D-Dimer test in relation to the BISAP scoring system had a 100% sensitivity in the identification of severe pancreatitis, with a 26% specificity in 24 hours and 100% sensitivity in 48 hours, with a 76% specificity, in addition to a 100% negative predictive value.

Conclusion: In conclusion, the D-dimer marker is a highly sensitive tool to determine severe pancreatitis, and it is considerably helpful as a negative predictive value.

Keywords: Acute Pancreatitis; D-Dimer; BISAP Score

Introduction

Acute pancreatitis is a highly prevalent disease at the hospital level where the cost of medical care can reach high fee due to hospitalization time [1]. Therefore, a diagnostic tool is still being proposed worldwide for patients with moderate or severe acute pancreatitis to perform an adequate management and avoid the possibility of longer hospitalization in a patient.

Currently, acute pancreatitis is divided into mild, if there is no evidence of systemic or local complications; moderate if there are transient complications that are corrected within 48 hours, and severe if the complications are persistent and last more than 48 hours [1].

For the evaluation of the type of acute pancreatitis that the physician faces, several clinical and biochemical scales have been proposed, but the BISAP (Bedside Index of Severity in Acute Pancreatitis) remains a score that measures 5 parameters that is very useful for the determination of the severity of this disease and that have shown the same validation in mortality prediction [1-14].

D-Dimer are products of fibrin degradation that are formed in thrombotic disorders such as pulmonary thromboembolism and venous thrombosis and in these entities it is of great help for the diagnosis [2]. Severe pancreatitis leads to ischemia of the pancreas and subsequently to the necrosis of the same by alteration in the microcirculation and in turn multiple organ damage may occur.

The measurement of D-dimer as a diagnostic tool for the severity of acute pancreatitis has been raised in some studies [3,4] and it has even been proposed that a D-Dimer greater than 500 ug/dl is the cut-off point to determine the presence of severity in the acute pancreatitis [3-5].

Methodology

An analytical epidemiological cross-sectional period design was applied. We worked on 60 patients admitted to hospital at the Eugenio Espejo Hospital with a diagnosis of acute pancreatitis who met the inclusion criteria and exclusion criteria. This sample was sufficient according to international bibliography.

Inclusion criteria

1. Men or women over 18 years old.
2. Patients admitted to hospital with a diagnosis of acute pancreatitis that meet two criteria of 3:
 - Acute abdominal pain less than 5 days evolution.
 - Amylase or lipase greater than 3n.
 - Image that suggests acute pancreatitis.
3. Patients who agree to enter the study.

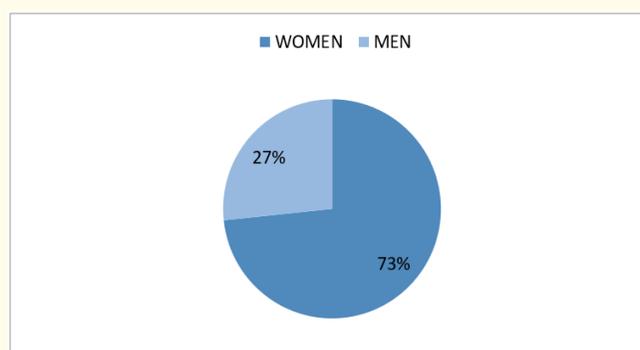
Exclusion criteria

1. Patients with acute cholecystitis, acute cholangitis.
2. Patients with acute pancreatitis after retrograde cholangiography endoscopic.
3. Patients who do not wish to participate in the study.
4. Patients under 18 years of age.

The BISAP score and D-dimer determination were performed at 24 hours and 48 hours after admission. Based on the BISAP, acute pancreatitis was classified and other variables were studied such as age, alcohol consumption, time of onset of symptoms and time of evaluation. The determination of Dimer D with the Cobas 6000 Team with the reagent D-DI2 Tina-quant dimer D of the second generation. This test was processed in the Eugenio Espejo Hospital laboratory and the cut-off value was 0.5 ug/dl for positivity.

Results

This study was carried out on 60 subjects admitted to hospitalization of the Eugenio Espejo Hospital in 2017 between the months of January and July with the diagnosis of acute pancreatitis fulfilling the inclusion criteria, to whom the BISAP score was determined and the determination of dimer D at 24 hours after admission and 48 hours later the results found were as follows.

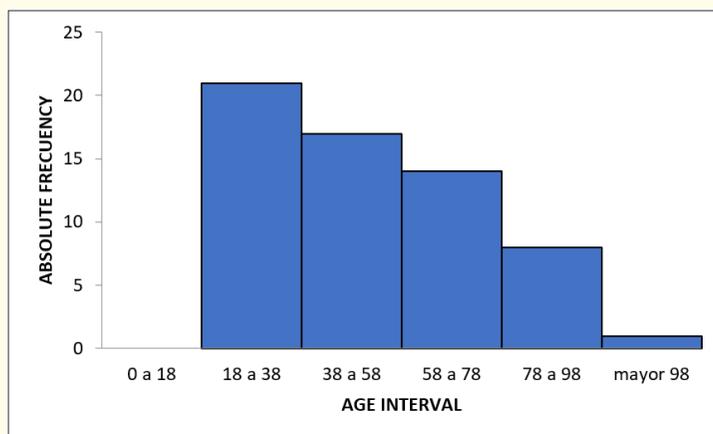


Graph 1: Percentual sex distribution in acute pancreatitis inpatients of Hospital Eugenio Espejo between January and July 2017.

Source: Research data

Elaboration: Dra. Verónica Ayala

Graph 2 shows that of the 60 subjects studied they were in an age range from 18 to 94 years with an average of 50.6 ± 21.7 years.



Graph 2: Distribution of age in patients with acute pancreatitis hospitalized at the Eugenio Espejo Hospital from January to July 2017.

Source: Research data.

Elaboration: Dra. Verónica Ayala.

Table 1 shows a percentage distribution of age in two age groups consisting of those under 65 years who occupied 70% of the subjects and a group of older and equal to 65 years that corresponded to 30%.

Age	No	%
< 65 Years	42	70
≥ 65 Years	18	30
Total	60	100

Table 1: Percentage distribution of age in patients with acute pancreatitis Hospitalized in the Eugenio Espejo Hospital from January to July 2017.

Source: Research data.

Elaboration: Dra. Verónica Ayala.

Alcohol Consumption	No	%
Mild or none	57	95
Moderate or high	3	5
Total	60	100

Table 2: Consumption of alcohol in patients with acute pancreatitis hospitalized in the Hospital Eugenio Espejo, 2017.

Source: Research data.

Elaboration: Dra. Verónica Ayala.

In alcohol consumption, two groups were selected, a group with occasional or mild consumption who occupied 95% of the subjects in the study, and another group with moderate to high consumption, who represented 5%.

The time of onset of symptoms of pancreatitis until they went to hospitalization of Eugenio Espejo Hospital averaged 38 ± 35.8 hours.

The table 3 shows the prevalence of severe pancreatitis that is established at 48 hours in 8.3% of the subjects under study and 91% of subjects with mild pancreatitis. At 24 hours the subjects defined as severe or moderate pancreatitis occupied 16.6% of the subjects in the study and of the patients with mild pancreatitis was 83.33%.

Severity of pancreatitis according to bisap	No	%
At 24 hours		
Moderate or severe	10	16,6
Mild	50	83,33
At 48 hours		
Severe	5	8,3
Mild	55	91

Table 3: Prevalence of severe acute pancreatitis according to the BISAP score at 24 hours and 48 hours.

Source: Research data.

Elaboration: Dra. Verónica Ayala.

D-dimer	BISAP	
	Positive	Negative
Positive	10	37
Negative	0	13

Table 4: Relationship between D-Dimer and BISAP to determine pancreatitis severe after 24 hours of evaluation.

Sensitivity: 100%, Specificity: 26%, VPP: 21% and VPN: 100%.

Source: Research data.

Elaboration: Dra. Verónica Ayala.

D-dimer	BISAP	
	Positive	Negative
Positive	5	42
Negative	0	13

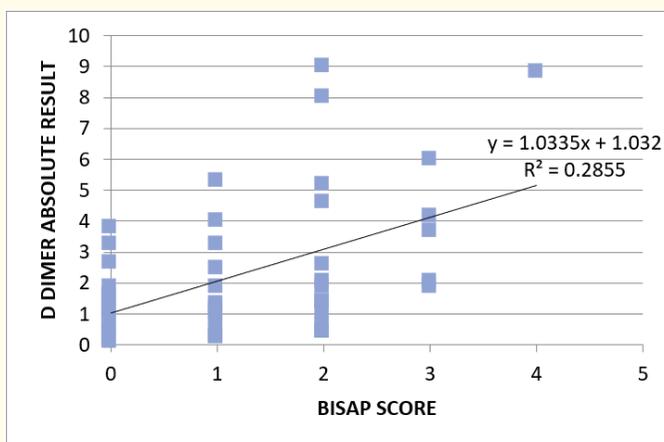
Table 5: Relationship between D-Dimer and BISAP to determine pancreatitis severe after 48 hours of evaluation.

Sensitivity: 100%, Specificity: 76%, VPP: 10% and VPN: 100%.

Source: Research data.

Elaboration: Dra. Verónica Ayala.

In the relationship between D-dimer and BISAP to determine severe pancreatitis, it is observed that the D-dimer at 24 hours has a sensitivity of 100% with a specificity of 26% and a negative predictive value of 100%. Although, at 48 hours D-dimer has a sensitivity of 100% with a specificity of 76% and a negative predictive value of 100%.



Graph 3: Correlation between absolute values of D-Dimer versus absolute values of BISAP.

Source: Research data.

Elaboration: Dra. Verónica Ayala.

When making a correlation between the values obtained from D-dimer and the absolute value of the BISAP score, a rising trend is observed in which the higher the BISAP score, the higher the D-dimer value.

It is important to mention that two patients were withdrawn from the study due to death in the first 24 hours.

Discussion

Acute pancreatitis remains a pathology of concern due to its possible complications, therefore some tools have been created that determine the prognosis of mortality or the prediction of severe acute pancreatitis. In this study, 60 patients diagnosed with acute pancreatitis who were admitted to the Eugenio Espejo Hospital were evaluated and the BISAP score and D-Dimer determination were performed 24 hours and 48 hours after admission.

The subjects studied were at an average age of 50.6 ± 22 years of which 70% were under the age of 60 years.

Of the subjects studied, 16% at 24 hours presented severe acute pancreatitis compared to the study by Radencovic who had 22% and this number in the two studies dropped to 48 hours after evaluation, according to the criteria to define severe acute pancreatitis [3].

Among the results found in this study it was observed that the determination of D-Dimer in relation to the BISAP as the gold test, showed a high sensitivity of 100% in identifying severe pancreatitis with a specificity at 24 hours of 26% and 48 hours a sensitivity of 100% with a specificity of 76%. In comparison with published studies Boskovic et al, in a study published in 2014 conducted at 35 patients found a similar sensitivity to determine d-dimer in search of multiorgan failure with a sensitivity of 100%, with a specificity of 62.1% [4].

The negative predictive value of D-dimer was 100%, which is why this study suggests that when d-dimer is determined in patients with acute pancreatitis, if the value obtained is less than 0.5 ugUEF/ml there is great security to predict that this group of patients will not develop severe pancreatitis.

Although the study did not seek to determine the correlation of D-dimer values and BISAP score, the values obtained when correlating them show high values in patients with severe pancreatitis versus patients with mild acute pancreatitis [15-68].

Conclusions

The determination of D-dimer greater than 0.5 ugUEF/ml is highly sensitive to identify moderate or severe pancreatitis compared with the BISAP score in patients admitted to the hospitalization of the Eugenio Espejo Hospital in Ecuador.

The usefulness of D-dimer as a negative predictive value in patients with acute pancreatitis suggests that when determining D-dimer, if the value obtained is less than 0.5 ug/ml, there is great certainty to predict that this group of patients will not develop severe or moderate pancreatitis.

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