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The Effectiveness of The Bisap Score, a Quick and Easily accessible Test, in identifying Patients with Severe Acute Pancreatitis

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Abstract

Background: Acute pancreatitis (AP) is a difficult condition that has a high fatality rate. Acute pancreatitis patients typically have minor attacks at first, which often go away on their own without any aftereffects. But in 10−20% of people, it can progress to a severe form. In this form, it can result in a more severe systemic inflammatory response and a longer hospital stay due to higher mortality rates from local and systemic consequences. The widely used scoring method for acute pancreatitis, Ranson's criteria, accurately predicts death rates. The Acute Physiology and Chronic Health Examination (APACHE-II) is another widely used ICU scoring system for acute pancreatitis. The Bedside Index for Severity in Acute Pancreatitis (BISAP) is a new rating system that has gained popularity recently. Objective: To evaluate the effectiveness of the BISAP score, a quick and easily accessible test, in identifying patients with severe acute pancreatitis. Study design: A cross-sectional study Place and Duration: This study was conducted in Peoples University of Medical and Health Sciences Nawabshah from October 2022 to October 2023. Methodology: For a sample size, we have used the non-probability consecutive sampling technique. The participants in this study were aged from 30 to 60 years. All of the participants were diagnosed with acute pancreatitis. Their diagnosis was identified on the basis of a serum amylase level >300 units/litre and a BISAP score greater than 3. Each criterion in the BISAP scoring system is assigned a score of 1 upon admission. These scores are then added together to provide a cumulative score that can range from 0 to 5. After being entered into the SPSS version 17 program, the data was examined. Results: Participating in this study were 120 patients in total. In this study, there were 51.67% female participants and 48.33% male participants. The participants were 54 years old on average. Nine days were the typical hospital stay. The age range of the majority of the patients was thirty to fifty years old. The pancreas necrotized in the majority of the individuals. Conclusion: A BISAP score higher than 3 is strongly correlated with significant morbidity.

Keywords

BISAP Score, Morbidity, Females, Acute Pancreatitis

Acute pancreatitis (AP) is a difficult condition that has a high fatality rate. Acute pancreatitis patients typically have minor attacks at first, which often go away on their own without any aftereffects [1]. But in 10−20% of people, it can progress to a severe form [2]. In this form, it can result in a more severe systemic inflammatory response and a longer hospital stay due to higher mortality rates from local and systemic consequences [3]. Many cases of severe acute pancreatitis that progress to systemic inflammatory response syndrome may result in organ failure and pancreatic necrosis [4]. Despite ongoing medical research, it is still not possible to assess the severity of AP early in the disease using one or several sets of studies. [5]. The fundamental purpose of the widely used scoring systems for evaluating morbidity and mortality is to compare results.

The widely used scoring method for acute pancreatitis, Ranson's criteria, accurately predicts death rates [6]. Nevertheless, there are two significant disadvantages: First of all, it takes 48 hours to finish, which means it misses the critical early therapeutic window. Second, the necessary data (such as PaO2, LDH, and fluid sequestration) are usually not routinely gathered during hospitalization or upon admission [7]. Acute Physiology and Chronic Health Examination (APACHE-II), another widely used ICU scoring system for acute pancreatitis, requires the collection of parameters, some of which are not relevant in acute pancreatitis and hence miss important markers such as pancreatic damage and necrosis [8]. The Bedside Index for Severity in Acute Pancreatitis (BISAP) is a new rating system that has gained popularity recently [9]. It's becoming acknowledged as a reliable technique for quickly classifying individuals at high risk in terms of mortality, systemic complications, and local issues.

Five things that are looked at during admission time make up the BISAP score system: pleural effusion on a regular chest x-ray, age over 60, mental impairment, positive SIRS (Systemic Inflammatory Response Syndrome), and BUN levels above 25 mg/dl [10]. Every variable receives a score of 1, and a total score greater than 3 indicates severe acute pancreatitis [11]. The purpose of this study was to evaluate the effectiveness of the BISAP score, a quick and easily accessible test, in identifying patients with severe acute pancreatitis.

Methodology

We have employed the non-probability consecutive sampling technique to determine the sample size. The study's participants ranged in age from thirty to sixty years old. Acute pancreatitis was the diagnosis made for each individual. Based on their blood amylase level of >300 units/litre and BISAP score of more than 3, their diagnosis was made. Written consent was acquired from each patient once they were told about the study.

Each criterion in the BISAP scoring system is assigned a score of 1 upon admission. These scores are then added together to provide a cumulative score that can range from 0 to 5. These criteria include evaluating altered mental status (defined as a Glasgow Coma Scale score of less than 15), the existence of SIRS (Systemic Inflammatory Response Syndrome) as demonstrated by particular signs, such as temperature of less than 36 °C or more than 38 °C, respiratory rate of more than 20 breaths per minute, TLC of less than 4 x 10^3 or more than 12 x 10^3 /mm^3, heart rate more than 90 beats per minute, age older than 60 years, blood urea nitrogen (BUN) levels greater than 25 mg/dl, and the presence of pleural effusion on a chest X-ray.

After being entered into the SPSS version 17 program, the data was examined. The mortality rates and morbidity, which included cases of organ failure and pancreatic necrosis, were calculated using percentages and frequencies.

Results

A total of 120 patients were part of this research. In this study, there were 51.67% female participants and 48.33% male participants. The participants were 54 years old on average. Nine days were the typical hospital stay. The gender classification of the participants is displayed in Table 1.

Table No. 1: The Gender Classification of The Participants.

Gender	N	%
Male	58	48.33
Female	62	51.67

Table number 2 shows the classification of the participants according to the age group. Majority of the patients were from the age group of 30 years to 50 years.

Table No. 2: Classification of the Participants According to the Age Group.

Age Group (Years)	N	%
30-40	42	35
41-50	42	35
51-60	36	30

Table number 3 shows the outcomes of the patients. Majority of the patients had necrosis of the pancreas.

Table No. 3: Outcomes of the Patients.

Outcomes	N	%
Respiratory failure	22	18.2
Renal failure	25	20.8
Cardiovascular failure	12	10.0
Necrosis of pancreas	83	69.1
Mortality due to BISAP score >3	20	16.6

Discussion

As of right now, patients who arrive early cannot be promptly diagnosed with severe acute pancreatitis using any well-accepted, decisive test or grading system [12]. This study, however, was carried out to assess BISAP's predictive ability in terms of early morbidity and mortality in cases of severe acute pancreatitis. According to our research, higher BISAP scores (> 3) are associated with higher rates of morbidity, such as organ failure and pancreatic necrosis, as well as mortality [13]. These findings support a number of worldwide research studies that highlight the link between severe acute pancreatitis and poor outcomes when BISAP scores are high.

It is essential to identify patients who pose a high risk upon admission for acute pancreatitis, as this enables their direct admission to intensive care units (ICUs) or high dependency units (HDUs) [14]. This makes it possible to successfully prevent and treat any emerging organ failure through ongoing monitoring. Also, finding and treating people with Systemic Inflammatory Response Syndrome (SIRS) as soon as possible is very important for stopping diseases like Multiple Organ Dysfunction Syndrome (MODS) and Multiple Organ System Failure (MOSF) from happening, which in turn lowers the death rate [15, 16]. APACHE-II is another ICU grading system used to determine the severity of acute pancreatitis [17]. It is complex and takes into account factors such as chronic illnesses that aren't directly related to acute pancreatitis. A significant disadvantage of APACHE-II is its poor predictive power in the initial phases of admission and its laborious application procedure [18].

The eleven factors that comprise the Ranson criteria—which are used to calculate fatality rates in cases of acute pancreatitis—are evaluated in two stages: six after admission and five upon admission. Scores less than 3, between 3 and 5, and greater than 6 correspond to mortality rates of 0-3%, 11–15%, and 40%, respectively [19]. Ranson's criterion's sensitivity ranges from 40% to 90%. Nevertheless, a number of studies have shown how predictively restricted its use is. Due to their poor negative predictive value and sometimes inconsistent sensitivity throughout studies, the current grading systems have not been shown to be the most successful in predicting severity.

The results of our investigation align with those of another study, which found that patients with acute pancreatitis and a BISAP score greater than three showed comparable patterns [20]. In particular, it was noted that 23% of cases had organ failure, 34% had pancreatic necrosis, and 18% of cases resulted in death. Likewise, pancreatic necrosis was found in 12 (46.2%) patients, and death was found in 4 (15.4%) patients in another investigation that included 26 patients with a BISAP score greater than 3.

Conclusion

A BISAP score higher than 3 is strongly correlated with significant morbidity, which is most prominently indicated by pancreatic necrosis, which is present in 83 (69.1%) cases. Additionally, death was noted in 20 (16.6%) patients among those with acute pancreatitis.

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Conflict in the Interest

None

Permission

It was taken for the ethical review committee.

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