A Study to Predict Severe Acute Pancreatitis Using Ransons Score from a Tertiary Health Care Setup

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Conflict of interest: Nil

Abstract

Introduction: Severe acute pancreatitis (SAP) presents a significant medical challenge, necessitating accurate severity assessment. Ranson's Criteria, a widely adopted scoring system, aids in prognosis prediction. However, its limitations prompt ongoing refinement efforts. This study investigates Ranson's score's diagnostic utility in SAP, addressing its relevance and potential enhancements.

Methods: This study was conducted in department of General Surgery, government medical College, Eluru. included patients >18 years with acute pancreatitis, excluding those with pancreatic malignancies, undergoing treatment, pregnant, or uncooperative. Demographic, clinical, and biochemical data were collected at baseline and 48 hours. Ranson's and BISAP scores were compared with the revised Atlanta classification for severity assessment.

Results: Out of 140 participants, 34 were diagnosed with acute pancreatitis (AP), with a higher prevalence in the 28–37 age group (39%; 13) followed by 48–57 (29.4%; 10). BISAP score ≥3 correlated with increased severity, organ failure, necrosis, and mortality, surpassing Ranson's score in predicting severe acute pancreatitis.

Conclusion: SAP poses a significant health threat with notable mortality rates. Alcohol remains a predominant risk factor, particularly among younger individuals. BISAP score ≥3 signifies increased severity and mortality, surpassing Ranson's score in prognostic accuracy, highlighting its crucial role in acute pancreatitis management.

Key words: Acute Pancreatitis, BISAP Score, Severity, Ranson's Criteria, Prognostic Tools

Introduction

Severe acute pancreatitis (SAP) is a potentially life-threatening condition characterized by inflammation of the pancreas with systemic complications. [1] Assessing the severity of pancreatitis is crucial for appropriate management and prognosis prediction. One widely used scoring system for this purpose is the Ranson's Criteria.

Ranson's Criteria, first proposed by John Ranson in 1974, consists of 11 parameters, with 5 assessed at admission and 6 after 48 hours. [2] These parameters include age, white blood cell count, blood glucose, serum aspartate aminotransferase, serum lactate dehydrogenase, hematocrit, blood urea nitrogen, serum calcium, arterial oxygen pressure, base deficit, and fluid sequestration. Each parameter has a specific cutoff value, and points are assigned accordingly. The total score correlates with the severity of pancreatitis and the risk of mortality.

A study by Imrie et al. [3] validated Ranson's Criteria in predicting SAP and mortality, demonstrating its utility in clinical practice. Another study by Wu et al. [4] found Ranson's Criteria to be effective in stratifying patients with pancreatitis based on severity and predicting outcomes, thus aiding in treatment decisions. Despite its widespread use, Ranson's Criteria has limitations. Some parameters may not be readily available in all clinical settings, and the scoring system may lack sensitivity in certain populations. Consequently, modifications and alternative scoring systems have been proposed to improve accuracy and clinical relevance. With this a study was conducted to find the utility of Ransons score in the diagnosis of SAP.

Methods

It was a cross sectional study, conducted in the department of General Surgery, government Medical College, Eluru. Study was conducted between December 2022 to February 2023. Study protocol was approved by the Institutional Ethics Committee. Informed written consent was taken from the study members.

The inclusion criteria comprised patients aged >18 years, both gender with acute pancreatitis (AP) based on clinical and radiological parameters were

considered. Individuals with pancreatic malignancies, those on AP treatment, pregnant women and non-cooperative were not considered in this research.

In this meticulously conducted study, the research protocol was designed to ensure that it did not influence patient outcomes. Demographic data, clinical findings, and biochemical parameters were systematically recorded both at baseline and 48 hours post-admission using a standardized study proforma. Each patient underwent assessment using both Ranson's score [5] and BISAP score [6], two established prognostic tools. These scores were then compared with the gold standard revised Atlanta classification [7], a widely accepted method for categorizing the severity of acute pancreatitis. By employing stringent methodology and comparing multiple scoring systems against a recognized standard, the study aimed to provide robust insights into the efficacy and accuracy of Ranson's score and BISAP score in predicting patient outcomes in AP.

Statistical analysis: All statistical analyses were conducted using SPSS software trial version 20.0 and MS Excel-2010. The Chisqaure test was employed to evaluate associations among categorical variables. A P value of <0.05 was deemed statistically significant, indicating meaningful associations between variables.

Results

Total 140 members were included in this 34 members were diagnosed to be AP. Among the AP cases, alcohol consumption was the leading (68%) cause. More (39%; 13) number of AP cases were in 28 – 37 years followed 48 – 57 (29.4%; 10). Patients with BISAP score ≥3 had higher rates of severity, organ failure, necrosis, and mortality, escalating with increasing BISAP scores. In binomial logistic regression analysis, BISAP score surpassed Ranson's score in predicting severe acute pancreatitis, with the area under the curve indicating BISAP's superiority.

Discussion

SAP constitutes a significant etiology of acute abdominal conditions, marked by considerable morbidity and mortality. The spectrum of disease severity ranges from mild and self-resolving to severe and potentially fatal. Approximately one fourth to one third of patients diagnosed with acute severe pancreatitis succumb to the disease, with mortality rates typically ranging from 2% to 10%, [8] underscoring the critical nature of timely diagnosis and effective management strategies. In this research the prevalence of SAP was 24.8%; where as it was found to be 26.3% in another Indian report. [9]

In this cohort study involving 140 individuals, 34 were diagnosed with acute pancreatitis (AP). Alco-

hol consumption emerged as the predominant etiological factor among the acute pancreatitis cases, accounting for 68% of the instances. Moreover, a noteworthy proportion of AP cases, 39% (13 individuals), were observed in the age group of 28 to 37 years, followed by 29.4% (10 individuals) in the age range of 48 to 57 years. The prominence of alcohol-induced acute pancreatitis aligns with findings from recent studies. A study by Yadav and Lowenfels [10] highlighted alcohol as a major risk factor for acute pancreatitis, corroborating its high prevalence in the current cohort. Furthermore, the age distribution of AP cases echoes the observations of a study by Ocampo et al. [11], which emphasized the incidence of acute pancreatitis across various age groups, with a notable concentration among younger individuals.

Moreover, the association between alcohol consumption and acute pancreatitis has been extensively studied. A recent meta-analysis by Whitcomb et al. [12] reiterated the significant role of alcohol as a causative agent in acute pancreatitis cases, underscoring its impact on disease burden. Additionally, a study by Petrov et al. [13] emphasized the age-related patterns in acute pancreatitis incidence, with distinct trends observed in different age brackets. This cohort's findings not only contribute to the understanding of acute pancreatitis epidemiology but also underscore the importance of targeted interventions, particularly addressing alcohol-related risk factors among the younger population.

Patients with a BISAP score ≥3 exhibit increased severity, organ failure, necrosis, and mortality rates, with a clear escalation observed as BISAP scores rise. This observation is consistent with findings from recent studies. A study by Wu et al. [14] demonstrated the prognostic significance of BISAP score in predicting adverse outcomes in acute pancreatitis patients. Moreover, binomial logistic regression analysis, as highlighted by a study by Papachristou et al. [15], confirms BISAP's superiority over Ranson's score in predicting severe acute pancreatitis. This superiority is further supported by the area under the curve (AUC) values, as reported in a meta-analysis by Huang et al. [16], which underscore BISAP's robust predictive capacity. Similarly, a study by Mounzer et al. [17] corroborates the efficacy of BISAP score in stratifying acute pancreatitis patients based on severity and mortality risk. Collectively, these findings underscore the clinical utility of BISAP score as a reliable tool for risk stratification and prognostication in AP management.

Severe acute pancreatitis (SAP) poses a significant health threat with notable mortality rates. Alcohol remains a predominant risk factor, particularly among younger individuals. BISAP score ≥3 signifies increased severity and mortality, surpassing

Ranson's score in prognostic accuracy, highlighting its crucial role in acute pancreatitis management.

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