

APACHE II Score for Early Severity Assessment in Acute Pancreatitis: A Prospective Clinical Study

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Abstract: Acute pancreatitis (AP) exhibits variable clinical severity ranging from mild, self-limiting illness to life-threatening complications. Early identification of severe cases is critical for appropriate management. The APACHE II (Acute Physiology and Chronic Health Evaluation II) scoring system, although developed for general ICU patients, is frequently applied in AP for early severity assessment. **Objective:** To evaluate the role of APACHE II in early risk stratification of acute pancreatitis and its correlation with clinical outcomes. **Methods:** A prospective observational study was conducted at Sri Siddhartha Medical College, Tumkur over 24 months, including 136 patients diagnosed with AP. APACHE II scores were calculated within 24 hours of admission. Data on demographics, etiology, clinical course, complications, and outcomes were recorded. Statistical analysis was performed to assess sensitivity, specificity, PPV, and NPV of APACHE II in predicting severe disease. **Results:** Among the 136 participants (mean age: 42.41 ± 12.26 years), 82% were male. Based on APACHE II, 40% of patients were classified as low risk (score <8), 44.7% as moderate risk (8–11), and 6% as high risk (>11). The sensitivity and specificity of APACHE II in predicting severe AP were 83.3% and 97.5% respectively, with an overall accuracy of 94.7%. Higher APACHE II scores correlated significantly with increased rates of organ failure, ICU admission, and mortality ($p < 0.05$). **Conclusion:** The APACHE II scoring system is a reliable tool for early prediction of disease severity in acute pancreatitis. It facilitates timely intervention, guides ICU resource utilization, and improves prognostic accuracy in clinical practice.

Keywords: Acute pancreatitis, APACHE II, risk stratification, ICU admission, clinical outcome

1. Introduction

Acute pancreatitis (AP) is an inflammatory condition of the pancreas characterized by a broad spectrum of severity. While most cases resolve with conservative management, approximately 20% of patients develop severe AP associated with multi-organ dysfunction and increased mortality. Accurate early stratification of patients based on severity is vital for improving clinical outcomes and resource allocation. The APACHE II score is a widely used physiological scoring system initially developed for ICU patients but increasingly applied to assess AP severity.

2. Materials and Methods

A prospective observational study was conducted at the Department of General Surgery, Sri Siddhartha Medical College and Research Institute, Tumkur from 2022 to 2024. Inclusion criteria were adults aged >18 years presenting with clinical and biochemical evidence of AP. Exclusion criteria included chronic pancreatitis, pancreatic malignancy, and incomplete data. APACHE II scores were calculated within 24 hours of hospital admission. Patients were monitored for complications, ICU requirement, and outcomes. Descriptive and inferential statistics were used for analysis.

3. Results

Of 136 patients, most were middle-aged males. Alcohol was the most common etiology. APACHE II scoring identified 54 patients (40%) as low risk, 61 (44.7%) as moderate, and 8 (6%) as high risk. Complications such as ARDS, renal failure, and sepsis were more prevalent in high-risk groups. Mortality was significantly higher among patients with APACHE II >11 . The scoring system had high predictive validity, with sensitivity 83.3%, specificity 97.5%, PPV 90.9%, and NPV 95.3%.

Table 1: Demographic Characteristics

Parameter	Value
Total Patients	136
Mean Age	42.41 ± 12.26 years
Gender (Male: Female)	82%: 18%
Most Common Etiology	Alcohol

Table 2: APACHE II Risk Classification

Risk Group	APACHE II Score	Number of Patients	Percentage (%)
Low Risk	<8	54	40.0
Moderate Risk	8–11	61	44.7
High Risk	>11	8	6.0

Table 3: Outcome Measures by Risk Group

Complication	Low Risk	Moderate Risk	High Risk
ARDS	2	6	5
Renal Failure	1	3	4
Sepsis	0	2	5
ICU Admission	5	12	8
Mortality	1	2	3

Table 4: Diagnostic Accuracy of APACHE II

Metric	Value (%)
Sensitivity	83.3
Specificity	97.5
Positive Predictive Value (PPV)	90.9
Negative Predictive Value (NPV)	95.3
Overall Accuracy	94.7

4. Discussion

This study supports the use of APACHE II scoring for early risk assessment in AP. Compared to other systems like Ranson's score, APACHE II offers advantages in early application (within 24 hours), dynamic monitoring, and broader physiological assessment. Limitations include the complexity of calculation and lack of pancreatic - specific parameters. Nonetheless, its predictive accuracy justifies its routine use in emergency settings.

5. Conclusion

APACHE II is an effective and practical tool for early risk stratification in acute pancreatitis. Its application allows timely identification of patients at risk for severe disease, enabling prompt intervention and improved patient care.

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