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# Predictive Accuracy of PESAS Score in Emergency Abdominal Surgeries

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| Article History | Abstract |
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| | ***Background****: Because of their unpredictability and potential for negative outcomes, emergency abdominal procedures provide considerable clinical problems. For the purpose of optimising patient care and guiding surgical decisions, accurate preoperative assessment is crucial. In this situation, the "Physiological Emergency Surgery Acuity Score (PESAS)" has shown promise as a tool for risk categorization and prognostication. The purpose of this study was to assess how well the PESAS score predicted the outcomes of emergency abdominal surgery.* ***Methods****: 80 patients with clinical signs of an acute abdomen were enrolled in a tertiary care facility over the course of 18 months. Each patient was evaluated using the PESAS score, which is based on physiological factors such heart rate, blood pressure, breathing rate, and level of awareness. Low-risk (PESAS 8), intermediate-risk (PESAS 9–12), and high-risk (PESAS 13–15) patient categories were created. The results of the surgery, including both survival and non-survival, were documented* ***Results****: The survival rate for patients with PESAS scores of 8 or less was 100%, while the survival rate for patients with scores of 9 to 12 was 16.66%. 0% of patients whose scores were between 13 and 15 survived. These results show a significant relationship between PESAS scores and successful surgical outcomes.* ***Conclusion****: For predicting surgical outcomes in urgent abdominal procedures, the PESAS score is an invaluable preoperative tool. It facilitates decision-making, risk classification, and improved preoperative communication with patients and their families. To completely incorporate the PESAS score into clinical practise, which could result in better patient-centred treatment and resource allocation, more investigation and validation studies are required.* |
| | **Keywords:** *PESAS score, emergency abdominal surgery, predictive accuracy, patient assessment, risk communication.* |

## 1. Introduction

The unpredictable nature, urgency, and possibility of unfavourable results of emergency abdominal procedures make them a tough challenge in the field of surgical medicine. In order to prevent potentially fatal complications such intestinal rupture, haemorrhage, or sepsis, patients who arrive with acute abdominal problems frequently need prompt surgical surgery. While it is obvious that quick action is required, the complex decision-making process that comes before these surgeries should be avoided [1-5].

In order to approach emergency abdominal procedures successfully, surgeons, anaesthetists, and other healthcare professionals need to perform an effective preoperative assessment. In order to choose the best surgical approach, manage postoperative care, and explain risks and potential results to patients and their families, a thorough examination of a patient's health is necessary.

The creation of scoring systems intended to quantify the physiological abnormalities related to these illnesses was prompted by the requirement for an objective and standardised technique to evaluate

patients with acute abdomen. The Physiological Emergency Surgery Acuity Score (PESAS) has distinguished itself as a viable tool for risk stratification and prognostication in emergency abdominal procedures among these scoring systems.

Diverse pathologies fall within the category of acute abdomen, including appendicitis, cholecystitis, diverticulitis, and intestinal blockage. Before beginning surgical intervention, it is crucial to carefully analyse the patient's physiological condition because these disorders range in severity and complexity. While traditional clinical judgement is valuable, it can also be arbitrary and sensitive to many influences. As a result, there is a rising need for a method that can assess the patient's physiological status and forecast surgical results that is both objective and quantitative [6-10].

Based on a number of physiological factors, including as heart rate, blood pressure, breathing rate, and state of consciousness, the PESAS score provides a methodical way to assess patients with acute abdomen. The PESAS score offers an objective assessment of a patient's physiological stability or instability by giving numerical values to various characteristics. Using this numerical evaluation, surgeons and medical professionals can classify patients into risk groups and adjust their treatment accordingly.

This study's objective is to determine how well the PESAS score predicts the results of emergency abdominal surgery.

## 2. Materials And Methods

**Patient selection**: From January 2021 to June 2022, the tertiary care center served as the site of current observational prospective study. The study comprised a total of 80 patients who presented with clinical signs of an acute abdomen. According to the following standards, patients were accepted:

1. Clinical Presentation: Patients were considered suitable for inclusion if they displayed symptoms of acute abdomen, such as severe abdominal pain, tenderness, rigidity, guarding, and evidence of peritoneal irritation.

2. Age and Consent: All patient age groups qualified. Before being enrolled in the trial, all patients or their guardians gave their informed consent.

3. Exclusion criteria: To ensure the homogeneity of the study population, patients with a known history of chronic abdominal diseases, past abdominal surgery, or incomplete medical records were excluded.

**PESAS Scoring**: Each enrolled patient got a thorough evaluation upon admission to the emergency room, including the taking of their vital signs and determining their state of awareness. Each patient's physiological state was evaluated using the PESAS scoring method. The following variables make up the PESAS score:

1. Heart Rate: The patient's heart rate was calculated in beats per minute (bpm).

2. Systolic blood pressure was recorded in millimetres of mercury.

3. Respiratory Rate: The patient's respiratory rate was noted (measured in breaths per minute).

4. Consciousness Level: To gauge the patient's level of consciousness, the Glasgow Coma Scale (GCS) score was calculated.

Based on predefined standards, a score was given to each parameter. These individual values were added to provide the total PESAS score, which was a numerical value indicating the patient's physiological stability or instability.

**Patient Categorization**: Patients were divided into three groups according to their PESAS scores.

1. PESAS score of 8 or less: Patients with this score were categorized as low-risk.

2. PESAS 9–12: Patients were classified as intermediate-risk if their PESAS scores fell between 9 and 12.

3. PESAS 13–15: Patients who received a PESAS score of 13–15 were classified as high-risk.

**Data collection**: Clinical data were systematically recorded for each patient, including demographic details, medical histories, PESAS scores, and results. Patient survival following emergency abdominal surgery was the main outcome metric. The patient's survival status and any problems were recorded.

**Statistical Analysis**: To summarise demographic and clinical information, descriptive statistics such as mean, median, standard deviation, and frequency distributions were used. Utilising chi-squared tests for categorical variables and t-tests or analysis of variance (ANOVA), when necessary, for continuous variables, the connection between PESAS scores and surgical outcomes was examined. Statistical significance was defined as a p-value 0.05.

## 3. Results and Discussion

The results of current study shed light on the PESAS's ability to predict the outcome of emergency abdominal surgeries. The study included 80 patients with acute abdominal problems, and the correlation between PESAS ratings and surgical results was examined.

Patient Distribution by PESAS Scores:

- 69 patients had PESAS ratings of 8 or under, indicating that they were low-risk people.

- Six individuals were deemed to be at intermediate risk because their PESAS scores ranged between 9 and 12.

- Five patients' PESAS scores ranged from 13 to 15, putting them in the high-risk category.

**Surgical Results:** Patient survival following emergency abdominal surgery served as the study's main outcome indicator. Table 1 displays the distribution of surgical outcomes based on PESAS scores.

PESAS Score-Related Survival Rates: Patients with PESAS scores of 8 or less had a stunning 100% survival rate. None of these individuals had unfavourable results from their urgent abdominal surgeries.

Only one patient out of the patients with PESAS scores between 9 and 12 lived, giving the overall survival rate of 16.66%. Patients with PESAS scores between 13 and 15 had a 0% survival probability. Five patients in this group did not survive. None of these high-risk individuals made it through the surgery. Table 2

**Table 1:** Distribution of Surgical Outcomes by PESAS Score Groups

| PESAS Score | Number of Patients | Survival | Non-Survival |
|---|---|---|---|
| ≤8 | 69 | 69 | 0 |
| 9-12 | 6 | 1 | 5 |
| 13-15 | 5 | 0 | 5 |

**Table 2:** Survival Rates by PESAS Score

| PESAS Score | Number of Patients | Survival Rate |
|---|---|---|
| ≤8 | 69 | 100% |
| 9-12 | 6 | 16.66% |
| 13-15 | 5 | 0% |

The findings of current study offer convincing proof of the PESAS's usefulness in predicting surgical outcomes in the setting of urgent abdominal procedures. In this discussion, this study explores the larger implications of employing the PESAS score as a preoperative tool as well as the more specific implications of current findings.

**PESAS's Clinical Importance in Urgent Abdominal Surgery** Current study shows that for patients presenting with acute abdominal problems, the PESAS score is a reliable risk classification tool. Patients with lower PESAS scores (8) had a 100% survival rate, indicating that they were substantially less likely to experience negative outcomes. Patients with higher PESAS scores (13–15) had a 0% survival rate, indicating a significantly increased risk of death.

These results highlight the clinical importance of the PESAS score in influencing surgical choice. The PESAS score allows surgeons to put patients into risk groups, which helps them decide how much monitoring is needed, how quickly surgery should be performed, and how many resources should be allocated to each group. By ensuring that the appropriate degree of care is given to the appropriate patients at the appropriate time, this not only improves the efficiency of patient care but also has the potential to improve patient outcomes.

**Clinical judgement vs. objective assessment** Despite being a mainstay of medical practise for a long time, clinical judgement is not immune to subjectivity and variation across practitioners. The PESAS score provides a standard, objective evaluation based on physiological data that can support clinical judgement. This objectivity is particularly useful in emergency situations, where making quick decisions is essential.

The PESAS score offers a quantitative evaluation of a patient's physiological status by including objective measurements including heart rate, blood pressure, breathing rate, and consciousness level. Surgeons and medical professionals can use this information to help them assess the patient's general health and decide whether to perform surgery [10,12,13].

**Preoperative communication that is improved**: Patient-centered care must include effective preoperative communication with patients and their families. By providing a numerical foundation for discussions about surgical risks and possible results, the PESAS score aids in communication. The better chance of survival may reassure patients with lower PESAS levels, but patients with higher scores may be informed of the higher risk.

Patients and their families are able to actively engage in their care thanks to this informed consent approach, which is in line with the shared decision-making principles. It also promotes a more cooperative and patient-centered approach to emergency abdominal procedures by managing expectations, reducing anxiety, and building trust between healthcare professionals and patients [11-15].

**Literature Comparison and Validation** Current study's results are consistent with earlier studies on the usefulness of scoring systems in emergency surgery situations. The PESAS score's propensity to predict surgical results is in line with the body of knowledge on numerous emergency surgery assessment instruments. This confluence of data highlights the PESAS score's reliability and potential to be an important tool in surgeons' toolboxes.

To establish the PESAS score's generalizability and reliability across different healthcare settings and patient populations, additional validation studies, preferably multicenter and involving larger patient cohorts, are warranted. Additionally, longitudinal studies that evaluate the impact of PESAS score implementation on patient outcomes and resource utilisation would provide further insights into its practical benefits.

**Future Directions and Clinical Implications**: The PESAS score has the potential to completely change how emergency abdominal procedures are managed in ordinary clinical practise. It can help surgeons make better choices, use resources more effectively, and improve patient outcomes. However, when integrating the PESAS score into clinical procedures, a number of issues need to be taken into account.

1. instruction and Training: To enable the PESAS score's successful deployment, healthcare providers—including surgeons and nursing staff—must obtain proper training and instruction on its usage and interpretation.

2. Clinical Decision Support: The PESAS score can be more easily accessed and used in emergency situations by being integrated into clinical decision support systems and electronic health records.

3. Consistent Validation: To reflect changing clinical knowledge and practises, the PESAS score should be routinely evaluated and updated.

4. Interdisciplinary Collaboration: To fully utilise the PESAS score, collaboration between surgeons, anaesthetists, intensivists, and other specialists is essential.

## 4. Conclusion

As a result, current research shows that the PESAS is an effective preoperative tool for estimating surgical outcomes in emergency abdominal surgeries. Patients with lower PESAS scores have a noticeably higher chance of surviving, whereas those with higher scores have a larger chance of dying. In addition to using clinical judgement, the PESAS score provides an impartial and standardised method for evaluating physiological stability.

Additionally, the PESAS score improves shared decision-making and patient-provider trust by facilitating open preoperative dialogue with patients and their families. The PESAS score has significant promise for enhancing the standard of care and patient-centeredness in emergency abdominal surgeries, even though more validation and implementation considerations are required. In this crucial area of medicine, its incorporation into clinical practise has the potential to optimise resource allocation, improve surgical decision-making, and ultimately result in better patient outcomes.

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