CASE STUDY
ACUTE PANCREATITIS
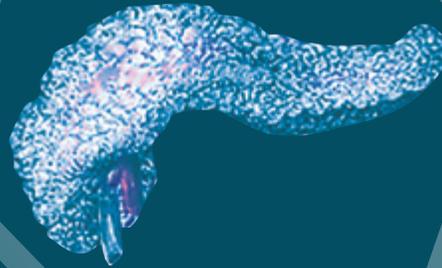
OBJECTIVE

To establish a simple prognostic assessment of acute pancreatitis that clinicians can apply in the ED.

Acute pancreatitis has become increasingly prevalent across the world, affecting nearly 85,000 individuals annually. Patients with acute pancreatitis experience significant rates of mortality in the emergency department (ED) and currently, there are no known drug treatments for the disease. Even though several long-term pancreatitis scoring systems exist (Ranson's criteria, APACHE-II score, and the BISAP index), there is a paucity of early prognostic scores that apply to the ED triage.
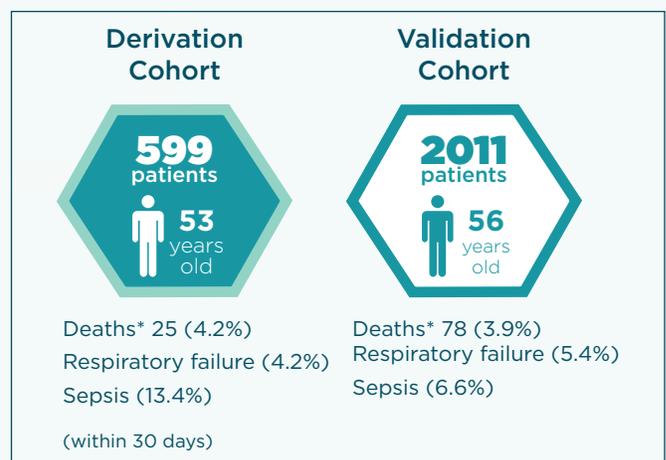
Nashville Biosciences®

APPROACH

Nashville Biosciences partnered with a leading biotechnology company developing new therapies for this serious condition and a top ED physician at a peer health system. First, we observed two key factors reported early in severe acute pancreatitis: the systemic inflammatory response syndrome (SIRS) and hypoxia. We subsequently incorporated SIRS and hypoxia with other well-known ED variables to develop a novel ED prognostic scoring system that predicts mortality in acute pancreatitis. In order to test our model, we performed a retrospective study of patients presenting in the ED with acute pancreatitis at Vanderbilt University Medical Center (VUMC) and the Henry Ford Hospital System (HFHS).

Three prespecified variables remained significant following multivariate analysis: 1) the presence of two SIRS criteria, 2) age > 60 years, and 3) peripheral capillary oxygen saturation (SpO2) < 96% in the ED. These 3 variables yielded the ED-SAS score, which ranged from 0 to 3, and was used to predict mortality in cases of acute pancreatitis.

RESULTS

Application of the ED-SAS score (predicting the probability of 30-day mortality in the derivation cohort) was 0%, 1.3%, 10.4% and 15.4% for incrementally higher scores from 0 to 3 with a c statistic of 0.80 (95% CI 0.73 – 0.87). When applied to the validation cohort, the c statistic was 0.77 (95% CI 0.68 – 0.86) and the 30-day mortality rates for the validation cohort were 0.8%, 3.6%, 8.3% and 23.9%.

Derivation Cohort

599 patients

53 years old

Deaths* 25 (4.2%)
Respiratory failure (4.2%)
Sepsis (13.4%)

(within 30 days)

Validation Cohort

2011 patients

56 years old

Deaths* 78 (3.9%)
Respiratory failure (5.4%)
Sepsis (6.6%)

CONCLUSIONS

In this study across two health systems and multiple EDs, we derived and validated a simple prognostic tool that focuses on 3 variables readily available in the early evaluation of a patient with acute pancreatitis: age, SIRS, and pulse oximetry reading on room air utilizing a retrospective analysis procedure. The predictive mortality based on higher ED-SAS scores could guide hospital transfer decisions and aid clinicians in prognosticating patients with acute pancreatitis.

BENEFITS

Progressive in nature

Personalized approach based on demographics

Time-efficient

Makes use of massive amounts of retrospective data

Supports novel R&D in diseases with clear unmet needs