THE USEFULNESS OF PROCALCITONIN IN AIDING PHYSICIAN ASSESSMENT AND TREATMENT OF POTENTIAL SERIOUS BACTERIAL INFECTIONS

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BACKGROUND

Procalcitonin (PCT) is used as a biomarker for the diagnosis of serious bacterial infections (SBI). To date, studies have not compared PCT to clinical judgment and it remains unclear whether PCT adds to the physician’s clinical judgment when diagnosing SBI.

OBJECTIVE

The current study evaluated the diagnostic usefulness of PCT in comparison to blood culture results and the physician’s clinical judgment in patients presenting to the Emergency Department (ED) with signs of sepsis or other SBI.

METHODS

A prospective cohort study was conducted with 400 patients suspected of having sepsis or an SBI who presented to the ED at two community hospitals in Wisconsin from 2016 – 2018. PCT was performed on all patients in addition to the standard of care (SOC) for suspected SBI. PCT results were not available to the physicians throughout the duration of the study. Physicians completed a brief survey that asked if they thought the patient was septic upon ordering SOC labs and again after they reviewed the SOC lab results. Chart reviews were conducted to collect study data and determine if patients were diagnosed with an SBI during their hospital stay.

Multivariate logistic regression analysis was used to examine factors associated with an SBI diagnosis. All potential predictors that were found to be significant during univariate analysis at the p ≤ 0.10 significance level were included in the model. The factors included in the model were PCT level, sex, blood culture result, ED volume/site, physician opinion of SBI pre-SOC labs, temperature > 100.4ºF or temperature < 96.8ºF, heart rate > 90, WBC > 12K or WBC < 4K or WBC > 10% bands, glucose > 140 in absence of diabetes, lactate > 2 mmol/L, C-reactive protein > 5 mg/dL, and INR > 1.5 or PT/PTT > 60 and not on anticoagulation. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

Among the patients, 186 (46.5%) were diagnosed with an SBI during their hospital stay. PCT results were higher for patients who were diagnosed with an SBI (median = 0.46) than for those who were not diagnosed with an SBI (median = 0.12), U = 12365.5, z = -6.58, p < 0.001, r = 0.33.

An ROC curve was used to evaluate the fit of the logistic regression model. The area under the curve (AUC) was 0.857 with 95% confidence interval (.819, .895), p < 0.001. This indicated the model was a good fit and classified the group significantly better than by chance.5

CONCLUSIONS

We found that PCT, blood culture results, and clinician judgment after reviewing SOC lab results provide important diagnostic value when diagnosing SBI. An ROC curve was used to evaluate the fit of the logistic regression model. The area under the curve (AUC) was 0.857 with 95% confidence interval (.819, .895), p < 0.001. This indicated the model was a good fit and classified the group significantly better than by chance.

REFERENCES


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