Early and long term prognostic accuracy of 4 acute pulmonary embolism mortality risk scores

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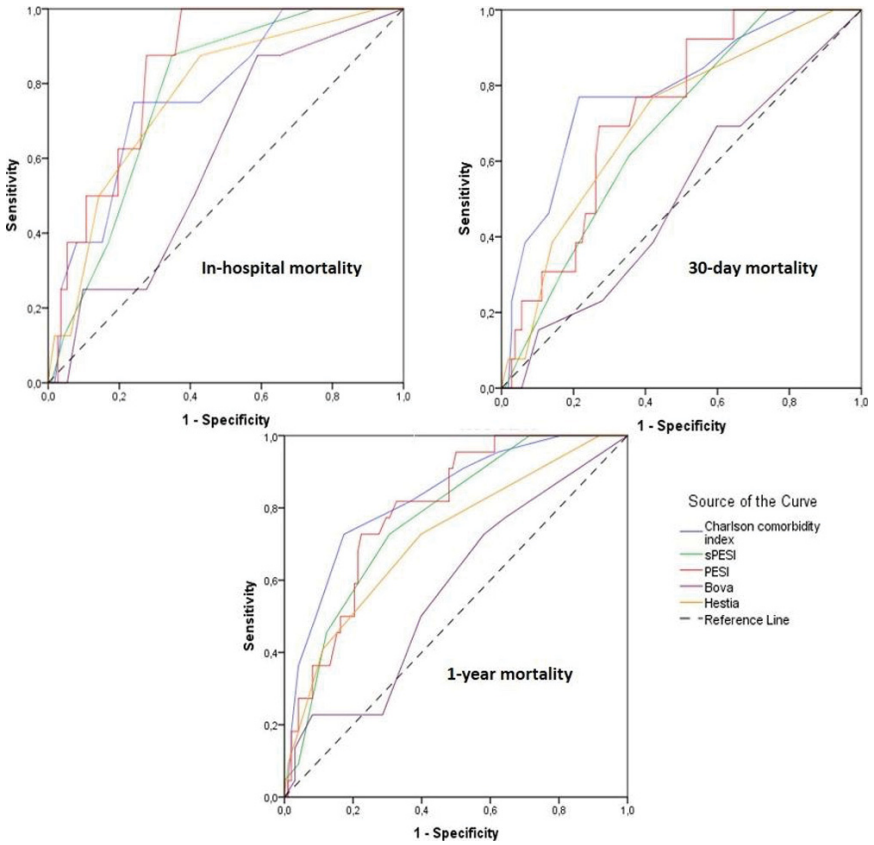
Background: Acute pulmonary embolism (PE) is a frequent condition associated with significant morbidity and mortality. Multiple scores have been developed and validated to predict 30-day mortality risk, however accurate prognostic assessment remains a challenge in clinical practice.
Purpose: To compare the performance of PESI, simplified PESI, Hestia and Bova scores in predicting in-hospital, 30-day and 1-year mortality risk for acute PE.
Methods: We retrospectively assessed consecutive patients from a single center registry who were hospitalized with acute PE between January 2017 and October 2020. Discriminative power of each score was assessed by receiver operating characteristic curve analysis. Charlson comorbidity index (CCI) was also assessed for comparison.
Results: A total of 131 patients with a mean age of 67.6±15.3 years were included with a mean follow-up of 46.3±17.7 months. Thirty-six patients (27.5%) had a recent hospitalization or major surgery and 26 (19.8%) a medical history of cancer. Besides anticoagulation, 7 patients (5.3%) underwent fibrinolysis. Overall in-hospital mortality was 8.4%, 30-day mortality 12.2% and 1-year mortality 19.8%. All acute PE scores, except Bova score, were significantly higher in those patients who died during hospitalization and on 30-day and 1-year follow-up. CCI was also higher in those patients. Discriminative power for in-hospital mortality was higher for PESI (c-statistic 0.84, 95% CI 0.74–0.93, p=0.002), followed by sPESI (c-statistic 0.77, 95% CI 0.65–0.90, p=0.010) and Hestia (c-statistic 0.77, 95% CI 0.61–0.92, p=0.011). The Bova score showed a poor discriminative power for prediction of in-hospital mortality (c-statistic 0.61, 95% CI 0.43–0.78, p=0.325). For 30-day and 1-year mortality PESI score still maintained the best performance with acceptable discriminative power (c-statistic 0.73, 95% CI 0.61–0.85, p=0.007 for 30-day mortality; c-statistic 0.80, 95% CI 0.71–0.89, p<0.0001 for 1-year mortality). However at longer follow-up CCI had a better performance to predict worse outcomes (c-statistic 0.79, 95% CI 0.65–0.92, p=0.001 for 30-day mortality; c-statistic 0.83, 95% CI 0.74–0.92, p<0.0001 for 1-year mortality).
Conclusions: All scores, except Bova score, showed overall good performance in stratifying mortality for acute PE, however PESI score performed better in this population particularly at shorter follow-up. At longer follow-up, although PESI score maintained an acceptable performance, comorbidities seem to play a bigger role. The different performance of multiple scores highlights the complexity of this condition.



ROC curves for mortality risk scores