Possible additive role of routine paraclinical data in improving the predictive value of simplified Pesi Score in acute pulmonary thromboembolism

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Background
For treating patients with pulmonary thromboembolism physicians need enough prognostic information to guide them in making correct decisions about outpatient treatment, admission to the intensive care unit, administration of fibrinolytic therapy & embolectomy.Although several prognostic models have been developed it seems that non of them perfectly use combination of clinical and para clinical findings, in order to give enough diagnostic and prognostic information in emergency room at the same time. One of these prognostic models is simplified PESI, developed to estimate 30 days mortality in patients with acute PE. The purpose of this study is to derive new version of simplified PESI by adding para clinical values and studying the new and simplified PESI power in predicting home mortality, short time adverse events defined as hospital death, fibrinolytic therapy, mechanical ventilation and embolectomy.

Methods
300 patients admitted in Shahid Madani Hospital with documented diagnosis of acute PE by using chest spiral computed tomography or high probability ventilation- perfusion scan during 2011-2013 enrolled in this derivation cohort study. Data was abstracted from the patients case records by replacing PaO2/PaCO2≤1.8 instead of O2 saturation, and adding RV strain (inverted T in V1-V3) or ST-segment elevation in lead aVR≥ 1mm (with 1 point) to simplified PESI we designed new PESI. All patients followed at least for 6 months after hospital discharge

Results
Home and in hospital mortality (long term all cause mortality) occurred in 73 patients (24.3%). Both predictive rules appropriately could predict hospital death ($p<0.001$), home mortality ($P<0.001$) fibrinolytic therapy ($P<0.001$) & need for mechanical ventilation ($P<0.01$ for new PESI and $P<0.001$ for simplified PESI). None of predictive rules could predict embolectomy ($P=0.27$ for new PESI and $P=0.64$ for simplified PESI) When we used combination of home mortality, hospital death, fibrinolytic therapy and embolectomy as a single variable, also both predictive scores appropriately could predict it ($p<0.001$). The area under ROC curve showed better performance for new PESI.

Comments
Adding Para clinical values to simplified PESI may help us to design more specific score with more diagnostic characteristics, and with the same predictive power. In other words, Using Para clinical items instead of subjective complaints of patients can validate significance of those complaints and help physicians to get enough prognostic and diagnostic information at the same time. This goal needs more investigations, we showed adding para clinical values to simplified PESI increased its sensitivity.