

Plasma Troponins Identify Patients with Very Low-Risk Acute Pulmonary Embolism

Bartosz Karolak¹, Marta Skowrońska¹, Michał Machowski¹, Olga Dzikowska-Diduch¹, Piotr Bienias¹, Martyna Kuryła¹, Małgorzata Wiśniewska², Marek Gołębiowski², Piotr Pruszczyk¹, Michał Ciurzyński¹

1 - Department of Internal Medicine and Cardiology, Infant Jesus Clinical Hospital, University Clinical Center, Medical University of Warsaw, Poland.

2 - Department of Clinical Radiology, Medical University of Warsaw, Poland.

Introduction: A proportion of patients with acute pulmonary embolism (APE) can be safely managed in an outpatient setting. We aimed to develop a risk-stratification algorithm for patients with APE and a simplified Pulmonary Embolism Severity Index (sPESI) score of 0 to identify candidates for safe outpatient treatment.

Materials and methods: We performed a post hoc analysis of a prospective study including 1,151 normotensive patients with at least segmental APE. The final analysis comprised 409 patients with an sPESI score of 0. Cardiac troponin levels were assessed immediately after admission. The clinical endpoint (CE) comprised APE-related mortality, rescue thrombolysis, and/or immediate surgical embolectomy due to clinical deterioration.

Results: The CE occurred in four patients, who had significantly higher serum troponin levels than patients with a favorable clinical course (troponin/ULN: 7.8 [6.4–9.4] vs. 0.2 [0–1.36], $p < 0.001$). Receiver operating characteristic analysis demonstrated excellent predictive performance of troponin for the CE, with an area under the curve of 0.908 (95% CI, 0.831–0.984; $p < 0.001$). A troponin level >1.7 times the upper limit of normal (ULN) was identified as the optimal cutoff, yielding a negative predictive value of 100% for the CE.

Conclusions: Clinical risk stratification alone is insufficient to identify patients with APE who are suitable for outpatient management. Patients with an sPESI score of 0 should undergo further risk assessment using biomarkers of myocardial injury. Patients with troponin levels ≤ 1.7 times the ULN represent a **very-low-risk** group with a favorable prognosis and may be considered for outpatient treatment.