

Serum lactate levels are an independent marker for complications in acute pulmonary embolism: from the PERT registry

Y. Wasserstrum, D. Lotan, D. Oren, S. Sanalla, E. Itelman, S. Dekel, R. Beigel, N. Shlomo, S. Matetzky

Sheba Medical Center, Ramat Gan, Israel

Funding Acknowledgement: Type of funding source: None

Introduction: Serum lactate is a marker for the presence and severity of imbalances between tissue oxygen supply and demand. There are only scarce data regarding the significance of arterial lactate in PE patients.

Purpose: We sought to explore the significance of venous serum lactate as a short- and long-term predictor of adverse outcomes.

Methods: We prospectively enrolled 570 patients with topographically-confirmed pulmonary embolism, hospitalized in our center during 2016–2019. Patient's data was collected using an electronic medical record and follow-up interviews via telephone. The combined end point of hemodynamic instability, shock, mechanical ventilation, or need for CPR was prospectively documented during hospitalization as well as 1-year mortality.

Results: The analysis included 461 consecutive patients with available clinical data including venous lactate. The median age was 69 years, and 262 (58%) were female. Median serum lactate levels were 21 mg/dL (IQR 16–31). The composite endpoint was documented in 92 patients (20%), and lactate levels above 21 mg/dl had a higher incidence of the composite end point (26% vs, 14%, $p=0.002$). Similar findings were seen when

adding either the need for escalating therapy (44% vs. 24%, $p<0.001$), in-hospital mortality (31% vs. 16%, $p=0.001$) or 30-day mortality (27% vs. 21%, $p<0.001$) to the previous composite. One-year mortality was significantly higher in the higher lactate group (17% vs 5%, $p<0.001$), and a lactate level above 21 mg/dL was independently associated with 1-year mortality in a Cox-regression model adjusted for age, gender and a history of heart failure or malignancy, HR 2.5 (95% CI 1.7–3.9).

In subgroup analyses, lactate levels were associated with 1-year mortality regardless of age or gender. Similar predictive trends for 1-year mortality were seen in patients stratified by diabetes status, a current malignancy, PE risk and right-ventricle abnormalities (see figure).

Conclusions: Venous serum lactate levels are associated with a myriad of in-hospital adverse outcomes, as well as long-term mortality. In a 1-year follow-up, a higher lactate level was predictive of mortality across various subgroups, with higher hazard ratios seen specifically in lower-risk patients. Further studies are needed in order to evaluate the possible prognostic role of the change in serum lactate during PE management.

