

Persistent right ventricular dysfunction increased risk for recurrent venous thromboembolism after acute pulmonary embolism

Grifoni S, Vanni S, Magazzini S, et al. Association of persistent right ventricular dysfunction at hospital discharge after acute pulmonary embolism with recurrent thromboembolic events. *Arch Intern Med.* 2006;166:2151-6.

Clinical impact ratings: Cardiology ★★★★★☆☆ Hematol/Thrombo ★★★★★☆☆ Pulmonology ★★★★★☆☆

QUESTION

In patients with a first episode of acute pulmonary embolism (PE), is persistent right ventricular dysfunction (RVD) associated with increased long-term risk for recurrent venous thromboembolism (VTE)?

METHODS

Design: Inception cohort followed for mean 3.1 years.

Setting: Emergency department of a hospital in Florence, Italy.

Patients: 301 patients 18 to 91 years of age (mean 65 y, 59% women) who were discharged from the hospital after a first episode of symptomatic acute PE that was confirmed by perfusion lung scan, spiral computed tomography, or pulmonary angiography. Patients with chronic obstructive pulmonary disease, heart failure, right ventricular hypertrophy, or life expectancy < 6 months were excluded. All patients received intravenous unfractionated heparin and thrombolytic therapy (if indicated) in the hospital and oral anticoagulant treatment for ≥ 6 months.

Prognostic factor: Acute RVD (right ventricular dilation, paradoxical septal systolic motion, or pulmonary hypertension identified by 2-dimensional echocardiographic Doppler examination) present at both hospital admission and discharge (persistent RVD).

Outcomes: Symptomatic, objectively confirmed, recurrent VTE and mortality related to PE.

MAIN RESULTS

20% of patients had persistent RVD, 29% had RVD on admission that regressed by discharge, and 52% had no RVD. Recurrent VTE and PE-related death occurred more

frequently in the group with persistent RVD than in the other 2 groups (Table).

CONCLUSION

In patients with a first episode of acute pulmonary embolism, persistent right ventricular dysfunction was associated with increased long-term risk for recurrent venous thromboembolism.

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Prognosis after acute pulmonary embolism (PE) in patients with and without persistent right ventricular dysfunction (RVD) at mean 3.1 years*

Outcomes	Persistent RVD	RVD regression	No RVD	RRI (95% CI)
Recurrent venous thromboembolism	24%	3.4%	9.7%	242% (78 to 508)
PE-related death	10%	0%	1.3%	1230% (176 to 5295)

*Abbreviations defined in Glossary. RRI and CI calculated from adjusted hazard ratios in article for persistent RVD vs RVD regression and no RVD.

COMMENTARY

In patients who present with submassive (hemodynamically stable) PE, 2 in 5 will have RVD, typically defined by RV hypokinesis (1). Although this finding has been associated with increased short-term mortality, the use of more aggressive thrombolytic therapy does not reduce mortality or recurrent VTE more than does conventional anticoagulation (2). Furthermore, RVD is transient in about half of affected patients. Thus, the long-term significance of RVD in patients with acute PE remains unclear.

The study by Grifoni and colleagues is novel in that it assessed the long-term prognosis of patients with and without RVD. It found a markedly increased risk for recurrent VTE in patients with persistent RVD, and 6 of 14 such patients with recurrent disease died of PE.

These findings, although compelling on the surface, have several limitations. First, this was a single-center study with a relatively small patient sample and the potential for referral bias. Second, treatment was not standardized: Selected patients received thrombolysis, and duration of anticoagulation varied. Third, cardiac troponins and B-natriuretic peptide might be suitable biomarkers of RVD, as in patients with acute PE (3, 4), and the tests for these markers are easier to do than echocardiography.

Should echocardiography become a routine part of the initial workup of patients with PE? Not yet, and preferably not until patient management trials are done similar to one that assessed persistently elevated D-dimer levels in patients with idiopathic VTE (5). Until then, it is reasonable to consider long-term oral anticoagulant therapy to

mitigate the risk for recurrent disease in selected patients with persistent RVD, such as those with impaired cardiorespiratory reserve, who may not be able to tolerate recurrent PE, or those with idiopathic PE.

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