Long-Term Effects of Acute Pulmonary Embolism on Echocardiographic Doppler Indices and Functional Capacity

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Summary

Background and hypothesis: Hemodynamic and functional consequences of acute pulmonary embolism (APE) are believed to be reversible with antithrombotic treatment. To verify this hypothesis, we reassessed our patients at least 1 year after an episode of APE.

Methods: We compared echo Doppler indices and 6-min walking test parameters (6-MWT) of 36 patients (13 men, 23 women, age 66 ± 11 years), studied on average 3.1 ± 2.2 years after an acute episode of pharmacologically treated massive or submassive APE, with data of 30 age-matched subjects (12 men, 18 women, age 67 ± 12 years).

Results: At least 1 year after APE, right ventricular (RV) diameter remained increased in patients compared with controls (27 ± 2 vs. 23 ± 2 mm, p < 0.001). Also, acceleration time of pulmonary ejection (AcT) was markedly shorter (97 ± 19 vs. 123 ± 19 ms, p < 0.001) and the diameter of the pulmonary trunk was significantly larger in patients than in controls (21 ± 2.6 vs. 18 ± 2.2, p < 0.001). Although the mean value of the tricuspid valve peak systolic gradient (TVPG) in the APE group at follow-up was similar to that in controls, TVPG > 30 mmHg was recorded in three patients with APE (8.3%). There was no difference in the distance of 6-MWT between both groups; however, the mean desaturation after 6-MWT was higher in the APE group than in controls (3.04 ± 2.08 vs. 1.45 ± 0.69%, p = 0.0005).

Conclusions: Pharmacologic treatment of acute pulmonary embolism does not prevent mild persistent changes in morphology and function of the cardiovascular system. Despite normalization of pulmonary artery systolic pressure and similar exercise capacity, survivors of APE present signs suggesting RV dysfunction and/or its disturbed coupling to the pulmonary arterial bed, as well as ventilation to perfusion mismatch at exertion persisting long after the acute embolic episode.

Key words: acute pulmonary embolism, echocardiography, right ventricular dysfunction, 6-minute walking test

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