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Does the Presence of Right Ventricular Hypo/Akinesia on Echocardiography in Patients with Submassive Pulmonary Embolism İncrease the Risk of Hemodynamic Deterioration and Mortality?

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Objectives: The most important cause of mortality in acute pulmonary embolism (APE) is the sudden increase in pulmonary vascular resistance, the resulting right heart failure and hemodynamic deterioration (hypotension and/or shock). Hemodynamic deterioration doesn't occur in every APE patient with right heart failure. Patients with right heart failure without hemodynamic deterioration is defined as submassive APE. In peitho study, rate of hemodynamic deterioration was 5% in submassive APE group. Right ventricular dilatation and wall hypo/akinesia are signs of right heart failure that can be detected in echocardiography. In particular, ventricular hypo/akinesia may be an indicative of possible haemodynamic deterioration or mortality as it is an indicator of myocardial ischemia. In this study, we sought to investigate the rate of hemodynamic deterioration and mortality in the submassive cases with hypo/akinesia in echocardiography.

Methods: We retrospectively analyzed the files of the patients who were followed-up with the diagnosis of APE between 2013-2019. Among the patients with right ventricular hypo/akinesia, those who were initially presented as massive APE were excluded.

Results: There were 23 submassive PE cases with hypokinesia/akinesia in echocardiography. In 5 of these cases, echocardiography findings were present before APE (in 3 cases previous history of PE, in 2 cases group 3 PAH). All these patients were discharged with low molecular weight heparin (LMWH) or vitamin K antagonist (VKA). Five of the remaining 18 cases were treated with thrombolytics (systemic or EKOS) without development of hemodynamic deterioration. One of these cases died during EKOS. Other cases were discharged. In one case who received LMWH/VKA treatment, hemodynamic deterioration developed and patient required thrombolytic therapy. This case was discharged without morbidity or mortality. Two of the 12 patients who did not receive thrombolytics died due to comorbidities (brain cancer, lung cancer). Only 2 patients in non-thrombolytic treatment group had control echocardiograpghy. One of them had partial and the other had complete recovery.

Conclusion: The number of cases in our study is few. In addition, some patients underwent thrombolytic therapy without hemodynamic deterioration. Therefore, generalization of results is not possible. However, these results suggest that the presence of right ventricular hypo/akinesia in echocardiography is not an indicator of hemodynamic deterioration alone and does not increase the risk of mortality and the majority of the cases can be managed with conventional anticoagulant therapy (LMWH/VKA).

Keywords: Echocardiography, mortality, submassivepulmonary embolism