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Optional therapeutic management of intermediate-risk pulmonary embolism patients

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Abstract

Background: Few studies have evaluated the thrombolytic treatment in patients with intermediate-high risk pulmonary embolism, making this study more valuable.

Material and methods: It was a prospective, non-randomized, open-label, single-center study. Eligible patients at the age of 18 or older with an acute pulmonary embolism (PE) confirmed by CT pulmonary angiography with onset until 14 day and signs of right ventricular (RV) overload on echocardiography took part in the study. Pulmonary Arterial CT Obstruction Index Rate (PACTOIR) was used to define the localization and the expansion zone of thromboembolism. This study included 18 patients with intermediate risk and acute submassive pulmonary thromboembolism. In thrombolysis (TT) group (n=9) were used 50 mg of tissue-plasminogen activator (t-PA) administered in infusion as 0.4 mg/h for 2 hours. In the standard anticoagulation group, unfractionated heparin (UFH) was administered as a bolus of 70 units/kg or a maximum of 5000 units, followed by continuous infusion at an initial rate of 16 units/kg or a maximum of 1000 units/h.

Results: The mean age for TT group was 69 vs 63 for the UFH group. PACTOIR was 100% in 3 patients in the half-dose rt-PA group and in 2 patients in the UFH group. RV/LV diameter ratio decreased from baseline to 48 h post-procedure (1.55 vs. 1.13; mean difference, -0.42; $p < 0.0001$). Mean pulmonary artery systolic pressure was 55 mm Hg in both groups ($p < 0.05$), with 53 [43–60] in TT group vs. 41.5 [37–45] mmHg in UFH group, $P < 0.05$. Also, RV/LV ratio and systolic PAP decreased significantly in both groups. Severe bleeding with a need in red blood cell transfusion was seen in 0.11% (1 patient) in the TT group vs 0 in UFH group. The hospitalization length of stay was significantly shorter in the TT group (3.8 ± 1.8 , $p < 0.05$). The rate of secondary endpoints was significantly higher in the UFH group with a high rate of pulmonary hypertension (0 vs. 19%, $p = 0.003$).

Conclusions: Half-dose thrombolytic therapy in patients diagnosed with submassive pulmonary embolism significantly reduced death and hemodynamic decompensation in the first 7 days compared to anticoagulant therapy only. With all that being said, it can be concluded that patients with high-intermediate risk PE could benefit from reduced-dose TT.

Key words: pulmonary embolism, intermediate risk, submassive pulmonary embolism.

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