



LETTER TO THE EDITOR

Controversial and future role of thrombolysis and endovascular therapies in submassive pulmonary embolism

Futuro controvertido del papel de la fibrinólisis y manejo endovascular en tromboembolia pulmonar submasiva

Dear Editor,

We have read with interest the review article by Pulido et al.¹ Early risk stratification is the cornerstone for success and effective therapy in acute pulmonary embolism (PE). Submassive (intermediate-risk) PE (20–25% of all PE events) represents a subgroup of patients with significant in-hospital mortality between 6 and 8%.² Submassive PE has been defined as patients presenting with preserved systemic normotension with objective evidence of right ventricular (RV) dysfunction, RV enlargement documented by transthoracic echocardiography (TTE), computed tomographic pulmonary angiography (CTPA) and elevated biomarkers of myocardial injury (troponins I or T and brain natriuretic peptide). There is still lack of consensus regarding the universal definition of RV dysfunction, particularly using echocardiography, for the reason that some investigators have used only one or very few echocardiographic variables for its definition.³

The benefit of thrombolysis in patients with submassive PE is controversial and a matter of debate. Thus, we would like to raise the following concerns: (1) Will thrombolysis in patients with submassive PE with objective evidence of right ventricular (RV) dysfunction by TTE have a positive impact in preventing the development of chronic thromboembolic pulmonary hypertension (CTPEH)? Since studies have shown that prevalence for CTPEH vary from 3% up to 8%^{4–6}; (2) In patients with submassive PE with evidence of acute pulmonary hypertension (PH) and significant abnormalities in the geometry of the right heart cavities (e.g. RV dilatation, right atrial enlargement, persistent McConnell's sign and noncollapsible inferior vena cava) well documented by TTE before and after thrombolytic therapy administration, will the best strategy to screen for the potential development of CTPEH could be after discharge from hospital and how often? (3) Do the authors believe that the ongoing Pulmonary Embolism International Thrombolysis

Trial (PEITHO/NCT00639743) will change future guidelines for the indication of thrombolysis in submassive PE?⁷

We think that persistent RV dysfunction, persistent PH, and exercise intolerance with the subsequent development of CTPEH represent significant associated end-point/goals of post-thrombolytic therapy that must be considered for future studies.

Percutaneous catheter-based therapies represent a future promise in the growing armamentarium for submassive PE, particularly if systemic thrombolysis is relatively contraindicated and possess a significant risk of bleeding.⁸ Ultrasonic-accelerated catheter-directed thrombolysis (UCDT), which uses low intensity high ultrasonic energy, was designed to help loosen and separate fibrin to enhance clot permeability while increasing the availability of more plasminogen activator receptors sites, driving the thrombolytic agent deep in to the blood clot to accelerate thrombolysis. UCDT represents a novel catheter-based therapy for massive and submassive PE.⁸

Engelhardt et al.⁹ studied 24 patients retrospectively, 19 with submassive and 5 with massive PE, by using UCDT, and found a significant reversal in right ventricular (RV) dysfunction by performing pre- and post-intervention by CTPA of right to left ventricular dimension ratio (RV/LV ratio) ($p \leq 0.001$). They did not report any significant or serious hemorrhagic complications upon discharge from the hospital. The ULTIMA trial (NCT01166997)¹⁰ tested the superiority of UCDT in patients with submassive PE with objective evidence of RV dysfunction when compared with anticoagulation alone, with the main outcome to demonstrate improvement of RV enlargement and dysfunction. Is it possible that we know your insight on this ongoing study and your opinion regarding UCDT therapies? We think that catheter-based therapies for massive and submassive acute PE will generate a positive impact on significant end-point/goals like functional capacity, exercise tolerance, mortality and prevention of CTPEH on this intriguing but very interesting subgroup of patients.

References

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