Cardiac arrest and thrombolytics

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The utility of systemic thrombolytic therapy in patients with cardiac arrest is a topic of continued debate. Multiple retrospective and prospective trials have attempted to address this question.

Recently, we tried to synthesize the available evidence with a systematic review and meta-analysis that included all major publications up to November of 2017.[1] Retrospective and prospective studies were analyzed separately. The prospective meta-analysis did not find a major statistical mortality benefit with thrombolytic therapy and was mainly driven by the TROICA trial conducted in Europe.[2] This trial, as most of the other prospective studies, included mainly out-of-hospital non-traumatic cardiac arrests; the retrospective studies included multiple in hospital events, potentially affecting the incidence of underlying causes of the arrests. The retrospective analysis found a possible survival benefit at discharge, opening the discussion of selective benefit of thrombolytic therapy in certain patient populations, particularly patients at increased risk of thrombotic etiologies, mainly pulmonary embolism.

To add to this discussion, Javaudin et al recently published a retrospective series of 246 patients who had an out-of-hospital non-traumatic cardiac arrest confirmed to be secondary to pulmonary embolism upon hospital admission (via computed tomography with angiography or echocardiography) and received thrombolytic therapy during advanced cardiopulmonary support.[3] The majority of patients received tenecteplase and had non-defibrillable cardiac rhythms. The study revealed a survival benefit at 30 days in the intervention group with no major differences in neurologic outcomes. Deep coma, as a cause of death, was less common in the intervention group. Finally, no differences were noted in mortality related to bleeding complications.

Despite the fear of using thrombolytic therapy in cardiac arrest patients, benefits seem to outweigh risks in patients with pulmonary embolism as the underlying etiology as suggested by the Javaudin study and our retrospective analysis. Further research is needed to find practical features that help select patients at increased risk of pulmonary embolism (based on history, physical examination, and bedside tools, like ultrasound), particularly considering the low prevalence of this as the cause of arrest (2.3% in the above mentioned study) in the outpatient setting. Additional study of potential complications, particularly those associated with bleeding, and costs incurred in patients with different arrest etiologies is needed.

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