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High-risk pulmonary embolism patients often go without most effective treatments

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Pulmonary embolism (PE), a blood clot in the lungs which causes shortness of breath and chest pain, is the third leading cardiovascular cause of death in the United States with more than 100, 000 lives taken each year. A typical intervention for PE patients includes anticoagulants in an effort to prevent migration of the blood clot, but the higher-risk PE population—about 30 percent of all PE patients—are potential candidates for catheter-directed thrombolysis (CDT) and systemic thrombolysis (ST), both of which employ "clot-busting" medications known as tissue plasminogen activator (tPA).

However, in a new study presented today at the American College of Cardiology 66th Annual Scientific Session, researchers from the Perelman School of Medicine at the University of Pennsylvania have found that the utilization rates of these potentially life-saving medications are low, particularly in the sub-group of PE patients who are critically ill.

ST is the method in which "clot-busting" medication is administered intravenously (IV) to eliminate clots throughout the bloodstream, while CDT allows the medication to be directly administered into the clot in the lungs.

"For years, ST and CDT have been available for use in patients with PE, however, there has been little research done to understand how these therapies are being utilized in the real-world," said the study's presenter Srinath Adusumalli, MD, chief cardiovascular medicine fellow in the

Perelman School of Medicine at the University of Pennsylvania. "Our initial data suggest that, in fact, both ST and CDT are used infrequently to treat PE, including in young, critically ill patients who may experience the highest clinical benefit from those therapies."

Adusumalli and his colleagues performed a retrospective study in which they collected data from the OptumInsight national commercial insurance claims database and identified 100,744 patients who had been hospitalized with PE during a ten-year period (2004-2014). This is the first study of its kind to examine detailed procedural coding for pulmonary embolism therapies from a national database, allowing researchers to aggregate information from a national population rather than hospital or region-specific information. The team culled through the data and found that of the 100,744 patients hospitalized with PE, 2,175 patients received either CDT or ST - roughly two percent of all PE patients. In this same timeframe, the number of PE hospitalizations increased by 306 percent.

"Another question that emerged from these findings is whether we are adequately matching the right patients to the right therapies at the right time," said senior author Peter W. Groeneveld, MD, MS, an associate professor of Medicine, research director in the Leonard Davis Institute of Health Economics, and director of Penn's Cardiovascular Outcomes, Quality, and Evaluative Research Center. "Since there is a lack of real-world clinical effectiveness and safety data on these therapies and a resulting lack of guideline-based recommendations, substantial clinical uncertainty persists as to when and in whom to use CDT and ST."

A larger team at Penn Medicine, including those who were involved with this study, created what's called the Pulmonary Embolism Response Team—or PERT—which is designed to employ rapid response techniques for the treatment of PE in order to match the right patient to the right therapy at the right time.

"The purpose of PERT is to ensure that high-risk PE patients are receiving the best kind of treatment plan on the most efficient timeline in order to improve outcomes," said Jay Giri, MD, MPH, an assistant professor of Cardiovascular Medicine and founder of the PERT at the Hospital of the University of Pennsylvania. "However, it is important to state that most decisions made by PERT physicians are a matter of clinical consensus rather than being based on rigorous comparative effectiveness research. The current study re-emphasizes the clinical consequences of the dearth of data in the PE field."

While the team notes these data are clinically useful and could impact the patient care decision-making process, there is still more research needed. Co-presenter and study author Bram Geller, MD, a cardiovascular medicine fellow in the Perelman School of Medicine at the University of Pennsylvania, added, "this study is the first in a two-step research plan, in which our next phase will be to actually evaluate the safety and clinical effectiveness of CDT versus ST by exploring patient outcomes in the OptumInsight commercial insurance claims database."

Provided by Perelman School of Medicine at the University of Pennsylvania