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OPTALYSE PE: EKOS® Offers New Options for Treating Submassive PE Patients

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Each year, approximately 48,000 people suffer from a pulmonary embolism (PE) in the United Kingdom. About 40% of these patients have submassive PE, a condition that presents a clinical challenge. The approved treatments for PE in the United Kingdom are simple and include extreme blood thinning. Funding is limited for interventional treatments, so very few patients with submassive PEs receive them, meaning we are much further behind the curve on the adoption of these interventional therapies for treating submassive PEs. However, the results of OPTALYSE PE represent an important step toward obtaining more funding for the use of this technology in the United Kingdom and other European countries. This will allow us to offer safer, more efficient treatment of submassive PE.

LESSONS FROM THE PEITHO STUDY

In the United Kingdom, patients with submassive PE (or intermediate-risk PE) typically receive standard anticoagulation therapy. However, this can take up to 2 weeks for the body to adequately lyse the clot and resolve strain on the right side of the heart, leaving patients prone to decompensation into right-heart failure and shock, with low blood pressure, organ failure, and even death, as demonstrated in the PEITHO (Pulmonary Embolism Thrombolysis) study.[1]

Although more aggressive treatment with systemic full-dose thrombolysis effectively dissolves the pulmonary clot and relieves strain on the right side of the heart, it is associated with high rates of bleeding. PEITHO demonstrated that treating submassive PE patients with full-dose, systemic thrombolysis leads to serious bleeding complications in 11.5% of patients (among patients > 75 years old, this risk is substantially higher). Essentially, PEITHO showed that every submassive/intermediate-risk patient saved with full-dose systemic thrombolysis was counterbalanced by another who suffered a life-threatening bleeding complication, including a 2% rate of intracranial hemorrhage.

THE GROWING EVIDENCE FROM ACOUSTIC PULSE THROMBOLYSIS™ THERAPY

With approximately 1,000 submassive PE patients per year suffering cardiovascular collapse or death in the United Kingdom, we need more effective treatment options for this large proportion of patients. Presently, very few patients (numbering in the low hundreds each year) in the United Kingdom with either submassive or massive PE are receiving interventional treatments. The results of the OPTALYSE PE trial[2] add to a growing body of research suggesting that Acoustic Pulse Thrombolysis™ (BTG International) therapy using the EKOS® device (BTG International) relieves strain on the right side of the heart in a manner that is faster than with heparin alone and safer than with systemic thrombolysis.

OPTALYSE PE builds on the findings of two earlier studies of Acoustic Pulse Thrombolysis™ therapy, suggesting that treatment with the EKOS® device could be a safer and more efficient treatment for submassive PE than either anticoagulation or full-dose systemic thrombolysis. The ULTIMA study showed, in a prospectively powered randomized trial, that Acoustic Pulse Thrombolysis™, with an average tissue plasminogen activator (tPA) dose of 20 mg, more effectively relieved right-heart strain than heparin alone, with few serious bleeding complications.[3]

SEATTLE II[4] provided further data that right-heart strain can be successfully relieved in the first 48 hours in patients with submassive PE using a standardized 24 mg of tPA for bilateral EKOS® devices (a 76% reduction in tPA dose compared with traditional thrombolytic therapy). OPTALYSE PE assessed several lower-dosing regimens, ranging from 8 to 24 mg for bilateral catheters (the significant majority of all cases). All regimens effectively reduced right-heart strain, with a similar reduction in CT-derived right ventricular/left ventricular diameter ratio at 48 hours of approximately 23% to 26% across all four treatment strategies assessed.

Across the three studies evaluating Acoustic Pulse Thrombolysis™ therapy for submassive PE, we now have a menu of doses and treatment durations for our patients. The question now is, which has the greatest net clinical benefit in this important group of patients?

IMPLEMENTING NEW PE TREATMENT STANDARDS

As Chief Investigator for OPTALYSE-UK, recruiting in up to 15 sites in the United Kingdom, we will examine

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this question while building further experience and support for the use of this therapy in a country where catheter-directed treatments are less frequently used than in the United States. As a Co-Investigator in the first OPTALYSE PE study, I have already begun incorporating the findings of OPTALYSE PE into my practice. Generally, I calibrate the tPA dose when using EKOS® therapy according to patient stability, degree of right-heart strain, clot burden, and bleeding risk. For example, in older patients with a relatively high bleeding risk due to comorbidities, I may opt for the lower doses used in OPTALYSE PE to reduce right-heart strain while minimizing bleeding risk. For a younger patient with a large volume of PE and significant right-heart strain, I will consider one of the higher doses used in OPTALYSE PE to dissolve more of the clot and further reduce residual thrombus burden.

CONCLUSION

There are 100 million cases of PE and other forms of venous thromboembolism worldwide each year.[5] I believe that as we start to deliver these interventional treatments with lower and lower doses of thrombolytic agents, they will be understood to be safer and more effective than current approaches. The United States is increasingly adopting Acoustic Pulse Thrombolysis™ into routine care, and I am hopeful that the United Kingdom will follow as we further build the evidence base. ■

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