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CIRSE 2014: Treating Pulmonary Embolism

A session on emergency treatment options for high and intermediate risk pulmonary embolism (PE) patients at the CIRSE congress in Glasgow reminded delegates of the seriousness of the condition. Prof. Nils Kucher from Bern, Switxerland explained that sequelae can include such thromboembolic pulmonary hyptertension. It is a leading cause of death worldwide, causing more than 400,000 deaths in Europe every year, at least 3 million deaths a year worldwide. Although much is invested in diagnosis and treatment, there is room for improvement.

In the session, Dr. Jan Beyer explained conservative treatment options, and Dr. Gregory Piazza and Prof. Kucher outlined results of treatment using the EKOS EkoSonic® Endovascular System in the United States and Europe.

Intermediate risk patients may deteriorate into shock within hours or days of diagnosis. Mortality in the intermediate group is 3 to 15%. Such patients need to undergo hospital treatment but, asked Beyer, what is the place for thrombolysis in this setting. There is no doubt that systemic thrombolysis can achieve rapid clot resolution in PE, but the question is how to identify those patients in need of thrombolysis. Chatterjee's recent meta-analysis, published in JAMA, showed that thrombolytic therapy was associated with lower rates of all-cause mortality and increased risks of major bleeding and intracranial haemorrhage. However, findings may not apply to patients with pulmonary embolism who are haemodynamically stable without right ventricular dysfunction. In intermediate risk PE patients treated with thrombolysis the relative risk reduction in mortality was 52% and the number needed to treat is 65.

Beyer noted that the recently published European Society of Cardiology's guidelines (Diagnosis and Treatment of Acute Pumonary Embolism) now differentiate between intermediate-high risk patients and intermediate-low. This distinguishes between the patient in shock and patient not in shock, and depends on the RV function test, if both positive or if one positive or both negative.

Dr. Gregory Piazza, of Brigham and Women's Hospital in Boston, described the results of the SEATTLE II trial, a prospective single arm multicentre trial to evaluate the efficay of US-facilitated catheter-directed low dose fibrinolysis using the EKOS EkoSonic® Endovascular System to reverse RV dysfunction. In this study the mean RV/LV ratio decreased from 1.55 pre-procedure to 1.13 at 48 hours post-procedure, a difference of 0.42 ($p<0.0001$). No patients with massive PE died during the 30 day follow up period. Of 150 patients in the overall study, only one death was directly attributed to PE. In addition, there were no intracranial haemorrhages and no fatal bleeding events. Major bleeds occurred in 17 patients; of these six occurred in patients with co-morbidities known to be associated with an increased risk of bleeding during thrombolytic therapy. Piazza concluded that ultrasound-facilitated catheter-directed low dose fibrinolysis for acute PE improves RV function and decreases pulmonary hypertension and angiographic obstruction. He called the technique a potential game changer in

treating high risk PE patients with a minimal risk of intracranial bleeding. Piazza also noted that one approach for selecting patients is to use multidisciplinary response teams, which includes physicians cardiovascular med, pulmonary medicine, radiology and cardiothoracic surgery to select for patients who should undergo advanced therapies and avoid the risk of bleeding.

The conclusion? Ultrasound-assisted catheter-directed thrombolysis is a promising treatment modality for patient with intermediate and high risk PE that rapidly reverses RV dysfunction and haemodynamic instability and is associated with a low risk of bleeding and mortality.

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