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Catheter directed therapies: an option for elderly frail patients with pulmonary embolism requiring reperfusion

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Current guidelines of the European Society of Cardiology indicate that the optimal management of acute pulmonary embolism (PE) depends on the risk assessment of PE-related early mortality[1]. Reperfusion therapy, preferably systemic thrombolysis, is still recommended as the first-line treatment in haemodynamically unstable patients. It should also be considered as a rescue therapy when initially normotensive subjects deteriorate despite adequate anticoagulation[1]. However, real life shows that more than half of high-risk PE patients do not receive systemic thrombolysis because of increased risk of bleeding[2]. Since the rate of major extracranial bleeding reached 11.1% in patients above 75 years of age in the PEITHO study, advanced age and frailty are often regarded as relative contraindications for systemic thrombolysis[3]. In such cases, surgical embolectomy or catheter-directed therapy should be considered as a primary or rescue reperfusion[1]. However, surgical embolectomy is not usually immediately available. Thus, with growing clinical experience, catheter-directed therapies have become a real therapeutic option for PE patients[4].

In this issue of EuroIntervention, Farmakis et al present the results of the US Nationwide Inpatient Sample from 2016 to 2020, including over 980,000 hospitalisations of PE patients aged ≥65 years (28.0% were frail)[5]. Reperfusion therapies were used in 4.9% of them, with an increase from 4.0% in 2016 up to 5.6% in 2020. Interestingly, the use of systemic thrombolysis and surgical embolectomy remained stable, while the application of percutaneous techniques almost doubled (from 1.7% to 3.2%). Although high-risk PE is a strong indication for urgent reperfusion therapy, such treatment was used only in 1 out of 6 haemodynamically unstable patients, with no significant increase over a 5-year period. Moreover, frailty additionally limited the utilisation of reperfusion therapy in elderly patients with high-risk PE. These observations indicate that the treatment of elderly high-risk PE patients definitively remains an Achilles' heel in PE management and should be improved. Importantly, Farmakis et al give us some hints. Among frail high-risk patients, catheter-directed thrombolysis when compared to systemic thrombolysis was associated with reduced major bleeding (odds ratio [OR] 0.51, 95% confidence interval [CI]: 0.41-0.63) and even with a lower in-hospital mortality rate (OR 0.36; 95% CI: 0.28-0.46). Moreover, intracranial haemorrhage, which is the most feared and devastating complication of lytic treatment, occurred in only 1% of patients treated with percutaneous techniques, while in the group treated with systemic thrombolysis, it reached 3%. This indicates that catheter-directed therapies may be a safer option for elderly, frail PE patients requiring reperfusion and might even suggest that such therapies may be even more effective than systemic thrombolysis or surgical embolectomy.

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Although the clinical evidence for the use of percutaneous techniques is rapidly increasing[6,7], we need more high-quality evidence on catheter-based therapies performed with different devices in patients with different clinical characteristics including

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different PE risk categories. Moreover, local pulmonary embolism response teams should be established to guide the therapy for PE patients[1,4,8]. Luckily, the results of currently ongoing randomised trials on percutaneous therapies for PE are expected in 2024, helping to determine the specific groups that could benefit from the various techniques[9,10].

Conflict of interest statement

The authors have no conflicts of interest to declare.

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