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EDITORIAL COMMENT

Acute pulmonary embolism care in Portugal: It's time to build the future

Tratamento da embolia pulmonar aguda em Portugal: é tempo de construir o futuro

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The past decade has brought a plethora of novel therapeutic tools and strategies to treat patients with acute pulmonary embolism (PE). Despite these breakthroughs, PE remains a potentially lethal disease, killing 4–10 people per 100 000 population in the Western world.[1] In current practice, most patients with PE can be successfully treated with anticoagulation alone. However, a proportion of high-risk and intermediate-high-risk patients require advanced therapies, such as systemic thrombolysis, catheter-directed thrombolysis and/or thrombectomy, or surgical embolectomy. Paradoxically, even though PE is the third most common cause of cardiovascular mortality, there is a paucity of robust data from randomized controlled trials supporting management of the most complex patients.

To address these limitations and to aid decision-making in areas of uncertainty, the concept of the PERT (pulmonary embolism response team) has emerged. This consists of a multidisciplinary team of experts with a centralized activation process, offering rapid multimodality assessment and risk stratification in challenging clinical cases, delineating an individualized diagnostic and therapeutic approach, and mobilizing the necessary resources to provide the recommended therapeutic strategies on time.[2] The structure and organization of this multidisciplinary team varies from hospital to hospital, according to existing resources. Regardless of these variations, implementation of PERTs has been shown to have a positive impact on outcomes, specifically by improving the time to PE diagnosis and initiation of therapy, increasing the use of advanced therapies, and reducing cost of care, length of stay and mortality.[3–5]

In this issue of the *Journal*, Rita Calé et al. analyze the current clinical recommendations for the use of percutaneous catheter-directed therapy (CDT) and propose a standardized approach for severe forms of acute PE, highlighting the role of the PERT in this setting.[6] Additionally, they propose a methodology for the coordination of regional resources in order to create an effective PE response network, based on the hub-and-spoke organization design. Recently, this author reported the first Portuguese experience of a single center in CDT for acute PE at higher risk.[7] CDT is indeed a hot topic nowadays. However, due to a lack of robust evidence as mentioned above, current recommendations for its use are based on expert consensus and non-randomized studies and registries. Accordingly, CDT should be considered for patients with high-risk PE, in whom thrombolysis is contraindicated or has failed, and for initially stable patients in whom anticoagulant treatment fails.[8]

Some questions arise from these recommendations, particularly the lack of an objective definition of treatment failure, and the availability of various different techniques for CDT, without clear evidence favoring one over the others.

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These issues highlight the role of PERTs to guide treatment strategies and the need for robust, appropriately sized randomized controlled trials focusing on clinical outcomes that address the following questions: In high-risk patients, is CDT comparable to systemic thrombolysis? In intermediate-high-risk patients, is CDT better that anticoagulation alone? Which CDT strategy provides better outcomes? Fortunately, there are ongoing randomized trials addressing these questions, one of the most promising of which (HI-PEITHO)[9] compares CDT to parenteral anticoagulation and aims to include over 400 intermediate-high-risk patients with additional severity criteria. One of its strengths resides in the primary outcome, which includes hard events such as seven-day PE mortality, venous thromboembolism recurrence or cardiorespiratory decompensation.[9]

The second part of Calé et al.'s article provides a conceptual model for a regional (and national) response network. The authors propose a hub-and-spoke model, similar to the management algorithm of ST-elevation myocardial infarction and stroke in Portugal. Its main components are Hub 1 (24/7 PE-intervention hospital), Hub 2 (working hours only PE-intervention hospital), Spoke (non-PE-intervention hospital that refers patients to Hub 1 and Hub 2), and emergency medical services which perform inter-hospital transfer. Importantly, the key component is the PERT, which clearly offers a more centralized pathway and focused expertise.

This is indeed an appealing concept, but although this is the right time to begin a broad, constructive discussion between the stakeholders, there are still a few unaddressed issues that prevent its short-term implementation. First, we lack an up-to-date, thorough knowledge of the epidemiology of PE in Portugal. The only available data go back to the period 2003–2013, which report an annual incidence of 35 per 100 000 individuals,[10] which is lower than the estimated rate of 40–115 per 100 000 population in international registries.[8] This suggests that there may be a high rate of under-diagnosis in Portugal, and it is urgent to obtain the most accurate numbers regarding PE in this country, since this will enable estimation of the incidence of high-risk and intermediate-high-risk patients who may benefit from CDT, the actual burden of these cases on the national health system, and the amount of human resources and infrastructure that will be required to address these needs. At the moment, it is accurate to state that CDT is underused in Portugal, and that PERTs are scarce throughout the country. Several factors contribute to this: the scarcity of definitive evidence supporting the benefits of CDT, lack of awareness of alternative advanced PE therapies and how to activate them, and deficiencies in human resources, expertise and/or medical devices and infrastructure (all closely related to adequate funding and working conditions). In order to enable a sustained growth of PE response networks, it is essential to consolidate existing PERTs and interventional teams, which can be achieved by creating opportunities for training and education, increasing the volume of cases and referrals, and raising awareness in the surrounding non-interventional centers. Additionally, the performance of these PERTs must be objectively assessed, in terms not only of their impact on outcomes, but also of their cost-effectiveness.

Undoubtedly, PE management is an emerging field, and ongoing clinical trials are expected to provide strong guideline recommendations in the near future. Until then, multidisciplinary assessment and decision-making offers the highest standard of care for these patients. Given the heterogeneity of PE care in this country, specifically the asymmetrical access to advanced interventional techniques, the organizational approach that is presented in this issue of the *Journal* represents a golden opportunity to improve our understanding of PE management while keeping one step ahead and anticipating the challenges and needs of such a demanding enterprise.

Conflicts of interest

The author has no conflicts of interest to declare.

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