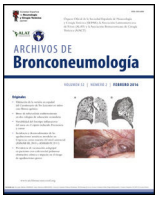
Arch Bronconeumol. 2019;55(1):1–2

Sociedad Española de Neumología y Cirugía Torácica SEPAR

ARCHIVOS DE Bronconeumología

www.archbronconeumol.org



Editorial

The Role of the Pulmonologist in a Pulmonary Embolism Response Team (PERT): A Time to Come on Stage

El papel del neumólogo en un equipo de respuesta a la embolia pulmonar (PERT): el momento de salir a escena

Diego A. Rodríguez Chiaradía[a,*], Michael J. Cuttica[b], David Jimenez[c]

[a] Pulmonology Department, Hospital del Mar, Institut Hospital del Mar d'Investigacions Mèdiques (IMIM), Universitat Pompeu Fabra (UPF), CIBERES, (ISCiii), Barcelona, Spain
[b] Division of Pulmonary and Critical Care Medicine Northwestern University Feinberg School of Medicine Chicago, Illinois, USA
[c] Respiratory Department, Hospital Ramón y Cajal, Madrid, Medicine Department, Universidad de Alcala (IRYCIS), Alcalá de Henares, Spain

Pulmonary embolism (PE) is a common prevalent condition with an overall crude incidence of 32.44 per 100 000 person-years in Spain and leads to more than 100 000 hospitalizations yearly in the last decade.[1] During this period, the mean cost per patient was more than €4000. In addition, it has been demonstrated a significant increase in hospital admission rates and associated cost.[1] In opposite trend, it has been shown an important decrease in PE mortality over time and hospital length stays.[1] These last points probably main related to an improvement in diagnostic techniques at early stages of the disease, adequate risk stratification,[2] and individualized anticoagulation treatment.[3]

However, and despite these efforts, PE is currently the third most common cause of cardiovascular death, only after myocardial infarction and stroke.[4] The mortality in PE is still elevated, being about 10%–15% in patients with intermediate-risk until more than 30% in high-risk.[5] Also, the patients who suffer cardiac arrest as a result of a PE have been reported 95% mortality.[6] Indeed, the real incidence of PE and its associated mortality is currently underestimated, because PE is a common cause of sudden death. In contrast, mortality in hemodynamically stable patients is lower than 3%.[6]

Rationale for PERT

In the last National Consensus of Patients with Pulmonary Embolism,[7] after the initial evaluation, we can identify four groups of patients according to clinical evaluation and myocardial status: low risk, standard risk, intermediate risk and high risk. Depends on the severity of the patient, the initial treatment of PE is aimed at medical stabilization and resolution of the vascular obstruction to prevent recurrence. In the majority of the occasions, conventional anticoagulant treatment for patients with low and standard risk is the adequate choice of treatment.[8] In another important group of patients (intermediate and high risk) a diversity of therapies (including systemic thrombolytic therapy; catheter-directed thrombolysis or pharmacomechanical catheter-directed thrombolysis) have been used for PE.[9] However, no existing studies have ever consistently shown a true mortality benefit from these therapies. This key point is critical in order to decide the more evidenced-based treatment for each patient.

In line with this, the proportion of patients requiring present invasive or thrombolytic therapies results in a substantial cost burden to health system.[1] Nevertheless, these treatments seem to be under a strong disagreement in the current guidelines.[7,10–12]

It is clear that intermediate risk and high-risk PEs require immediate attention, close monitoring, and coordination of multiple specialties because disease processes are not static and the patients can deteriorate quickly. However, the availability of some treatments and techniques is not always present in some centers. For this reason the coordination with referral centers may be critical.[13] Moreover, guidelines differ in their recommendations of these therapies in which some areas remain unclear.[10–12]

PERT: initial results

In this clinical scenario, the lack of a unified approach to the treatment of PE and the multidisciplinary nature of venous thromboembolism (VTE) provide a strong rationale for developing a team approach. There was an unmet need for multidisciplinary collaboration between expert clinicians to provide individualized therapeutic options for these patients. Therefore, in 2013, physicians at the Massachusetts General Hospital (MGH) devised and implemented a Pulmonary Embolism Response Team (PERT) to provide rapid and specialty care to complex patients presenting with an acute PE.[14]

The goal of the PERT is to quickly assemble a multidisciplinary team of specialists to rapidly evaluate intermediate and high-risk

* Corresponding author.
E-mail address: darodriguez@parcdesalutmar.cat (D.A. Rodríguez Chiaradía).

https://doi.org/10.1016/j.arbres.2018.04.002

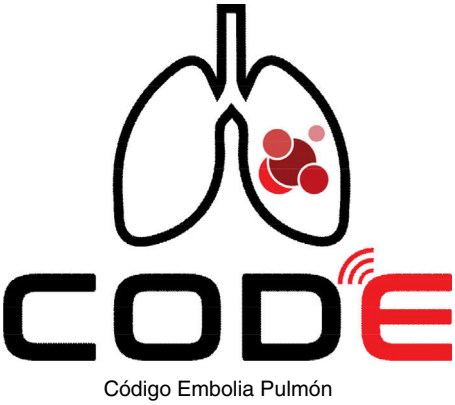


Fig. 1. Ramon y Cajal Hospital PERT.

patients, to formulate a concise plan, and to mobilize the necessary resources in a timely fashion.

This model has revolutionized the way PE is treated and researched. To date, the PERT concept has expanded to more than 140 international academic and non-academic centers, allowing for the generation of the PERT Consortium™.[15]

Recent data from the Mass General PERT program found that PERT activations slowly grew over time.[16] The majority of activations came from the emergency department. Forty-six percent of PEs were submassive and 26% were massive. The most common treatment given was anticoagulation alone (69%). However, systemic or catheter-directed thrombolysis was given in 11% of patients. Unfortunately, large-scale, prospective, randomized clinical trial data to guide the necessary prompt decision-making in patients with acute PE are lacking. Furthermore, is essential moderate that process taken into accounts the risk of the patient, resources and evidence.

Spanish experience

The Hospital Ramon y Cajal PERT is the first of these teams in Spain (Fig. 1). It is comprised of representatives from Respiratory, Cardiology, Emergency, Internal Medicine, Intensive Care, Radiology, and Vascular Departments. The pager is carried by the Respiratory service, as it takes calls 24 h/day, 7 days/week. The Respiratory physician examines the patient and then determines whether multidisciplinary decision-making is necessary. We identified 18 patients who received formal consultations from our PERT between 1 June 2017 and 28 February 2018. Sixteen patients met criteria for high- or intermediate-high risk PE, and 2 patients were deemed to have a high risk of bleeding.

Role of respiratory physicians: Where do we go from now?

Up to the present time, the role of Pulmonologist into PERTs groups is not entirely clear. In most of the cases, it is only a part of the team like many other specialties (i.e. Hematology, Internal Medicine, etc.). However, as has been demonstrated in a recent publication, a 100% of pulmonary services are involved in the process of PERT.[17] In contrast, only in few cases Pulmonologist coordinate that process.[17] In this line, limited data in "Respiratory" Journals have been published during the last years, indicating a little interest or a lack of knowledge on that issue.

Despite that PERT have gained considerable traction and favor among many physicians who perform pulmonary artery catheter-based procedures, the adequate coordination to understand whether a team-based approach to PE results in improved patient outcomes or rather an overutilization of resources and increased cost or clinically relevant complication requires a specialty physicians with a comprehensive knowledge of the disease beyond invasive techniques.

It is clear that PERT is a well-designed multidisciplinary team approach to individualize the treatment of acute PE, however, the key function of Pulmonologists will be an increase in the next years to the improved outcomes vs overutilization of resources, increased cost and complications.

References

1. de Miguel-Díez J, Jiménez-García R, Jiménez D, Monreal M, Guijarro R, Otero R, et al. Trends in hospital admissions for pulmonary embolism in Spain from 2002 to 2011. Eur Respir J. 2014;44:942–50.
2. Jiménez D, Aujesky D, Moores L, Gómez V, Lobo JL, Uresandi F, et al., for the RIETE investigators. Simplification of the Pulmonary Embolism Severity Index for prognosticating patients with acute symptomatic pulmonary embolism. Arch Intern Med. 2010;170:1383–9.
3. Konstantinides SV, Barco S, Lankeit M, Meyer G. Management of pulmonary embolism: an update. J Am Coll Cardiol. 2016;67:976–90.
4. Stein PD, Matta F. Epidemiology and incidence: the scope of the problem and risk factors for development of venous thromboembolism. Crit Care Clin. 2011;27:907–32.
5. Pollack CV, Schreiber D, Goldhaber SZ, Slattery D, Fanikos J, O'Neill BJ, et al. Clinical characteristics, management, and outcomes of patients diagnosed with acute pulmonary embolism in the emergency department: initial report of EMPEROR (Multicenter Emergency Medicine Pulmonary Embolism in the Real World Registry). J Am Coll Cardiol. 2011;57:700–6.
6. Piran S, Le Gal G, Wells PS, Gandara E, Righini M, Rodger MA, et al. Outpatient treatment of symptomatic pulmonary embolism: a systematic review and meta-analysis. Thromb Res. 2013;132:515–9.
7. Uresandi F, Monreal M, García-Bragado F, Domenech P, Lecumberri R, Escribano P, et al. National consensus on the diagnosis risk stratification and treatment of patients with pulmonary embolism. Arch Bronconeumol. 2013;49:534–47.
8. Dudzinski DM, Piazza G. Multidisciplinary pulmonary embolism response teams. Circulation. 2016;133:98–103.
9. Jaber WA, Fong PP, Weisz G, Lattouf O, Jenkins J, Rosenfield K, et al. Acute pulmonary embolism: with an emphasis on an interventional approach. J Am Coll Cardiol. 2016;67:991–1002.
10. Jaff MR, McMurtry MS, Archer SL, Cushman M, Goldenberg N, Goldhaber SZ, et al. Management of massive and submassive pulmonary embolism, iliofemoral deep vein thrombosis, and chronic thromboembolic pulmonary hypertension: a scientific statement from the American Heart Association. Circulation. 2011;123:1788–830.
11. Kearon C, Akl EA, Comerota AJ, Prandoni P, Bounameaux H, Goldhaber SZ, et al. Antithrombotic therapy for VTE disease: antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. Chest. 2012;141 2 Suppl.:e419S–96S.
12. Konstantinides SV, Torbicki A, Agnelli G, Danchin N, Fitzmaurice D, Galiè N, et al. 2014 ESC guidelines on the diagnosis and management of acute pulmonary embolism. Eur Heart J. 2014;35:3033–69, 3069a–3069k.
13. Witkin AS, Harshbarger S, Kabrhel C. Pulmonary embolism response teams. Semin Thromb Hemost. 2016;42:857–64.
14. Provias T, Dudzinski DM, Jaff MR, Rosenfield K, Channick R, Baker J, et al. The Massachusetts General Hospital Pulmonary Embolism Response Team (MGH PERT): creation of a multidisciplinary program to improve care of patients with massive and submassive pulmonary embolism. Hosp Pract (1995). 2014;42:31–7.
15. Barnes GD, Kabrhel C, Courtney DM, Naydenov S, Wood T, Rosovsky R, et al. Diversity in the Pulmonary Embolism Response Team Model: An Organizational Survey of the National PERT Consortium Members. Chest. 2016;150:1414–7.
16. Zern EK, Young MN, Rosenfield K, Kabrhel C. A Pulmonary Embolism Response Team: initial experiences and future directions. Expert Rev Cardiovasc Ther. 2017;15:481–9.
17. Barnes G, Giri J, Courtney DM, Naydenov S, Wood T, Rosovsky R, et al. National PERT™ Consortium Research Committee. Nuts and bolts of running a pulmonary embolism response team: results from an organizational survey of the National PERT™ Consortium members. Hosp Pract (1995). 2017;45:76–80.