



Early discharge after acute pulmonary embolism: keep quality of life on the radar

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Quality of life improves following early discharge for acute PE, but not for all patients. Clinicians need to understand factors affecting quality of life for a given patient and must identify patients needing more support after discharge. <https://bit.ly/35dWzgV>

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Patients with acute pulmonary embolism (PE) present with a spectrum of clinical severity and PE-related outcomes. In recent years, risk stratification based on clinical, biochemical and imaging features has been used to predict the risk of adverse events and determine optimal therapy for patients with PE. The European Society of Cardiology (ESC), in conjunction with the European Respiratory Society (ERS), published recent guidelines for the diagnosis and management of acute PE that support the use of stratification of patients into risk categories to determine the management strategy with an optimal risk-benefit ratio (class I, level B recommendation) [1]. Patients with PE who have haemodynamic instability have the highest risk of mortality and warrant urgent revascularisation. There is a large group of intermediate risk patients who are haemodynamically stable but have other risk features, such as significant tachycardia or right ventricular (RV) dysfunction, for which therapy beyond anticoagulation remains controversial. In contrast, patients who are haemodynamically stable with no high-risk features may be considered for oral anticoagulation and outpatient management [1].

Historically, PE patients were admitted to hospital to monitor for early adverse events and venous thromboembolism (VTE) progression or recurrence. Dating back 20 years ago, cohorts of patients were described to be safely managed as outpatients [2]. Both the Hestia criteria and Pulmonary Embolism Severity Index (PESI) score, including the addition of feasibility criteria for eligibility of outpatient management, have been studied in small clinical trials and cohort studies to assess the safety for early discharge home. The adverse event rate of VTE recurrence and PE-related death ranged from 0% to 0.6% [3–5]. The majority of patients in early home discharge studies have used low molecular weight heparin with transition to a vitamin K antagonist, with fewer on a direct oral anticoagulant (DOAC) [3–5].

With the widespread use of DOACs for the treatment of acute PE, outpatient management of low-risk PE patients is appealing, with possible advantages of reduced healthcare costs, decreased hospital complications, and improved patient satisfaction [6, 7]. Health-related quality of life (HRQoL) is known to

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be impaired in patients after acute PE [8, 9], however, there remains a paucity of data on how early discharge and outpatient management of PE affects HRQoL and patient satisfaction.

In this issue of the *European Respiratory Journal*, BARCO *et al.* [10] report their findings from a complete analysis of the Home Treatment of Patients with Low-Risk Pulmonary Embolism with the Oral Factor Xa Inhibitor Rivaroxaban (HoT-PE) single arm clinical trial. The HoT-PE study was stopped early after a predefined interim analysis and the present paper includes the additional patients that were enrolled during the interim analysis. The HoT-PE study enrolled a total of 576 patients who met the study definition of low-risk PE, based on Hestia criteria plus no signs of RV dysfunction on computed tomography or echocardiogram. The primary outcome, PE-related mortality or recurrent VTE at 3 months, occurred in three patients (0.5%, one-sided upper 95% CI 1.3%) and all events were non-fatal recurrent PE with the earliest at 7 days post-diagnosis. Major bleeding on rivaroxaban occurred in six patients (1.1%, 95% CI 0.4–2.3%). The 1-year mortality was 2.4% (95% CI 1.3–4.0%), most of which were related to malignancy and none of which were related to PE. The present analysis of the full cohort of 576 did not change the conclusions from those made on the basis of the previously published 525 patients [11], that an early discharge strategy is effective and safe for low-risk PE patients. Among the 576 patients, 551 (88.3%) were admitted to hospital for median of 33 (interquartile range 23–47) h prior to discharge.

The novel results reported in the current issue of the *European Respiratory Journal* relate to quality of life and its evolution after early discharge for acute PE. The HoT-PE study assessed HRQoL at 3 weeks and 3 months after enrolment using the generic EuroQoL-5D-5L and disease specific PEmb-QoL questionnaires, and patient satisfaction with anticoagulation was assessed using the Anti-Clot Treatment Scale (ACTS). The key findings were that the majority patients have good HRQoL, as defined by over 60% of patients having no complaints using the generic tool EuroQoL-5D-5L, at both time periods. Thus, in addition to being safe, an early discharge strategy is acceptable and does not detrimentally affect quality of life for the majority of patients. Despite the encouraging findings that HRQoL improved in all domains over the 3 month period, an important minority of patients (approximately 10%) still had moderate to severe impairment in the EuroQoL-5D-5L at 3 months [10]. Standard follow-up occurred at 3 months and patients had access to a 24-h emergency telephone number; however, the frequency of unscheduled patient contact was not described; quality of life measures at 3 weeks may be more reflective of transition to outpatient care and frequency of early follow-up rather than impact of hospital discharge itself. Longer term evolution in HRQoL (*i.e.* over 12 months) is not reported for the HoT-PE study, but others have shown a gradual improvement towards a “normal” HRQoL by 12 months after PE [12].

There are some interesting insights and new questions raised from the HoT-PE study. The radar plot in their figure 1 shows that the most important contributor to the PEmb-QoL score at 3 weeks and 3 months post-PE was “work-related issues”. This domain impairment likely reflects lingering effects of PE and/or treatment, as a short hospital stay (almost half of patients spent two nights in hospital) would likely not contribute to occupational function outwards to 3 months. We hypothesise that a more prolonged hospitalisation for PE management would have further impacted domains within HRQoL, but because there was no comparator arm, this is unknown. Additionally, how soon outpatient follow-up was after hospital discharge in each centre was not described, the timing of which could conceivably impact quality of life in the early days and weeks post-PE.

It is also particularly interesting that PEmb-QoL scores were worse in women, those with elevated body mass index, and patients with cardiopulmonary disease. Male patients are more likely to have persistent, long-term impairment in exercise capacity after acute PE [9], but the reasons for worse HRQoL in women after early discharge are not known. This raises an important question about gender-specific impacts of acute PE and early discharge. Further research is warranted to identify the problems uniquely faced by women, such as how gender roles, family responsibilities, or other sociocultural factors influence HRQoL after an early discharge for acute PE. Patients with obesity or cardiopulmonary disease are known to have worse quality of life after PE [8], and in the HoT-PE study these patients also had worse PEmb-QoL scores at 3 weeks and 3 months [10]. However, since quality of life prior to the diagnosis of acute PE was not recorded for these patients, it is not known whether poor HRQoL after PE simply reflects worse HRQoL in these patients at baseline. Nevertheless, these results suggest that patients with these comorbidities should be identified at the time of discharge to ensure adequate follow-up, care, and for short-term support to be arranged. Older age and cancer diagnosis were not associated with worse quality of life, perhaps because such patients tend to already be well embedded into a supportive outpatient health care network.

There has been increasing interest in evaluating quality of life and patient-important outcomes after VTE. While measures of quality of life can be helpful to identify different domains of interest that are affected or changes over time, more functional measures have been recently proposed, such as the Post-VTE

Functional Status scale developed by consensus with VTE researchers and patients [13]. In addition to a better understanding and follow-up of functional limitations that exist post-PE (e.g. post-PE syndrome) [9], important psychological impacts, such as post-PE anxiety and distress, have been described [14, 15]. There are ongoing efforts to standardise common data elements and core outcome sets in VTE randomised controlled trials, and a renewed focus to incorporate patient-important outcomes into trials is needed. By better understanding the functional and psychological recovery post-PE, we can better assess new therapies and develop outpatient targeted interventions to optimise care for our patients.

What is clear from the HoT-PE study is that, while low-risk PE patients can be safely managed with early discharge and quality of life remains good for most individuals, clinicians need to keep quality of life and post-PE symptom recovery on their radar. Multiple factors can influence quality of life after PE and personalisation of follow-up is important. Primary care physicians and multidisciplinary thrombosis follow-up clinics should include an objective assessment of HRQoL when re-assessing PE patients. Extrapolating from the HoT-PE study results, they should also assess the adequacy of social supports, especially for patients who are working, for women, and those with obesity or cardiopulmonary comorbidities.

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