

Editorial

The New Prognostic Stratification of Acute Pulmonary Embolism: Toward the Global Approach to the Patient

Prognostic stratification is a key point for clinical care of acute pulmonary embolism (PE). Its aims are: (i) early mortality risk assessment, (ii) appropriate treatment, and (iii) appropriate setting of care.

Clinical presentation, echocardiography and biomarkers represented the key points on which European Society of Cardiology (ESC) proposed a revolutionary point of view in 2008 [1]. The 2008 ESC prognostic model suggested to divide acute PE in high risk presenting with shock or hypotension, intermediate risk PE, hemodynamically stable, which was defined when at least one of echocardiographic or biomarkers signs of right heart dysfunction (RHD) or myocardial damage were present and low risk PE, hemodynamically stable, which was defined when RHD or myocardial damage signs were contemporary absent. Early mortality risk ranged from over 15% in high risk to 3-15% in intermediate risk to less than 1% in low risk. However the 2008 prognostic model underwent to criticism, due to the lack of consideration of co-morbidity. It is widely accepted and documented by literature evidence that co-morbidity such as advanced age, respiratory failure, history of cancer, chronic obstructive pulmonary diseases, heart failure, renal impairment, liver diseases etc. influences outcome in acute PE.

Over the years, practical clinical scores, such as the Pulmonary Embolism Severity Index (PESI) in its original or simplified version, have been produced and diffused [2,3]. Main advantage of these scores is to identify low risk patients with a 30-days mortality risk $\leq 1\%$. It has been postulated that the combination of 2008 ESC prognostic model, mainly based on hemodynamic parameter, and clinical prognostic scores, mainly based on co-morbidity, may improve the prognostic stratification of acute PE, especially for patients with intermediate risk in whom the range of early mortality risk is wide, from 3% to 15%. The 2014 version of ESC recommendation on management of acute PE suggests that the original or simplified PESI score should be used as first step to divide the non high risk PE, hemodynamically stable, in low or intermediate risk [4]. Original PESI score classes I-II or simplified PESI score 0 identify patients with low risk PE, whereas original PESI score classes III-V or simplified PESI score ≥ 1 identify patients with intermediate risk PE. Accordingly, intermediate risk is divided in intermediate-low when only one finding of echocardiography or biomarkers signs of RHD or biomarkers signs of myocardial damage are present and intermediate-high risk when all findings (RHD and myocardial dysfunction) are contemporary present. The new prognostic view may improve the choices of treatment and setting of care. In fact, high risk patients should be quickly undergone to reperfusion by using thrombolytic agents or embolectomy and admitted in intensive care units, intermediate-high patients should receive parenteral and/or oral anticoagulants and close monitoring due to risk of hemodynamic deterioration needing for rescue thrombolysis or embolectomy, intermediate-low risk patients may receive parenteral and/or oral anticoagulants and admitted in ordinary ward without close monitoring and, finally, low risk patients may be treated at home or early discharged from Emergency Department by using a single drug approach with direct oral anticoagulants such as rivaroxaban or apixaban or a fast switching from parenteral to oral anticoagulants such as dabigatran or edoxaban [5].

Nevertheless requiring a validation in real life, the 2014 version of ESC recommendations on management of acute PE consider the patient globally, taking in account hemodynamic parameters and co-morbidity. Another step forward has been done.

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