Med Clin (Barc). 2018;151(4):136–140

MEDICINA CLINICA

www.elsevier.es/medicinaclinica

Original article

Clinical gestalt versus prognostic scores for prognostication of patients with acute symptomatic pulmonary embolism☆

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ARTICLE INFO

Article history:
Received 21 May 2017
Accepted 2 November 2017
Available online 20 July 2018

Keywords:
Pulmonary embolism
Prognosis
Prognostic scales
Clinical assessment
Mortality

ABSTRACT

Background and objective: To determine the accuracy of clinical gestalt to identify patients with acute symptomatic pulmonary embolism (PE) at low-risk for short-term complications.
Patients and methods: This study included a total of 154 consecutive patients diagnosed with acute symptomatic PE in a tertiary university hospital. We compared the prognostic accuracy of the Pulmonary Embolism Severity Index (PESI), the simplified PESI (sPESI), and clinical gestalt of (1) 2 senior physicians (one with and one without experience in the management of patients with PE), (2) a fourth-year resident of Pneumology, (3) a third-year resident of Pneumology, and (4) a second-year resident of Pneumology. The primary outcome was all-cause mortality during the first month after the diagnosis of PE.
Results: Thirty-day all-cause mortality was 8.4% (13/154; 8.4%; 95% confidence interval [CI], 4.1–12.8%). The PESI and clinical gestalt classified more patients as low-risk, compared to the sPESI (36.4%, 31.3% and 28.6%, respectively). There were no deaths in the sPESI low-risk category (negative predictive value 100%). Prognostic accuracy increased with increasing experience (84.6 vs. 92.3%; $p = 0.049$).
Conclusions: The sPESI showed the best accuracy at correctly identifying low-risk patients with acute symptomatic PE. Clinical gestalt is not inferior to standardized clinical prediction rules to prognosticate patients with acute PE.

Evaluación clínica frente a escalas estandarizadas para el pronóstico de los pacientes con tromboembolia pulmonar aguda sintomática

Palabras clave:
Tromboembolia de pulmón
Pronóstico
Escalas pronósticas
Evaluación empírica
Mortalidad

RESUMEN

Fundamento y objetivos: Determinar la utilidad de la estratificación pronóstica empírica para identificar a pacientes con tromboembolia de pulmón (TEP) aguda sintomática y bajo riesgo de complicaciones precoces.
Pacientes y métodos: Este estudio incluyó a un total de 154 pacientes consecutivos diagnosticados de TEP aguda sintomática en un hospital universitario terciario. Comparamos la capacidad pronóstica de la escala clínica Pulmonary Embolism Severity Index (PESI), la escala PESI simplificada (PESIs) y la evaluación empírica de: *1)* 2 médicos adjuntos (uno con y otro sin experiencia en el manejo de pacientes con TEP); *2)* un residente de cuarto año de Neumología; *3)* un residente de tercer año de Neumología, y *4)* un residente de segundo año de Neumología. El evento primario de mal pronóstico fue la mortalidad por todas las causas durante el primer mes después del diagnóstico de la TEP.

☆ Please cite this article as: Quezada CA, Zamarro C, Gómez V, Guerassimova I, Nieto R, Barbero E, et al. Evaluación clínica frente a escalas estandarizadas para el pronóstico de los pacientes con tromboembolia pulmonar aguda sintomática. Med Clin (Barc). 2018;151:136–140.
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Resultados: Durante los primeros 30 días después del diagnóstico de la TEP se produjo el fallecimiento de 13 pacientes (8,4%; intervalo confianza [IC] del 95%, 4,1-12,8%). Hubo una tendencia (no estadísticamente significativa) a clasificar más pacientes de bajo riesgo mediante la escala PESI o la evaluación empírica que con la escala PESIs (36,4, 31,3 y 28,6%, respectivamente). No se produjo ningún evento en el grupo de pacientes de bajo riesgo según la escala PESIs. Se detectó una mayor eficacia pronóstica de la estratificación empírica conforme mayor fue la experiencia clínica de los evaluadores (84,6 vs. 92,3%; p = 0,049).
Conclusiones: La escala PESIs es la herramienta más eficaz para identificar pacientes con TEP aguda sintomática y bajo riesgo de muerte por todas las causas durante el primer mes de seguimiento. La evaluación pronóstica empírica realizada por médicos experimentados no es menos eficaz que la realizada mediante escalas estandarizadas.

Introduction

Pulmonary embolism (PE) is a disease with a broad spectrum of clinical manifestations, with different prognosis and treatment. Mortality by PE ranges from 2% in normotensive patients and 30% in patients with hemodynamic instability or shock.[1] Therefore, the prognostic stratification of patients with acute symptomatic PE has become an essential requirement for choosing the best therapeutic option.[2] Patients with a low risk of early complications may benefit from early discharge or even ambulatory management of their disease.[3–7] In contrast, patients at high risk should be monitored closely and the use of more aggressive treatments for early recanalization of occluded arteries (fibrinolysis, percutaneous fragmentation or surgical embolectomy)[8,9] should be considered.

The specialists involved in the management of patients with PE require reliable prognostic information[10] and different tools have been proposed for the prognostic stratification of these patients: clinical indices, biologic markers (troponin or brain natriuretic peptide and imaging tests (echocardiography or chest CT angiography [angio-CT]). In this sense, several prognostic clinical indices have been developed and validated. Among them, the Pulmonary Embolism Severity Index (PESI) identifies patients with PE and low risk of early complications in whom early discharge or outpatient treatment can be considered.[11–14] The simplified PESI (sPESI) is as useful as the original index for the identification of patients with low risk, but without the complexity of the original one.[15] These indices have demonstrated their reproducibility independently of the experience of the specialist who applies them.[16] To date, no study has evaluated whether empirical (subjective) prognostic stratification is as effective as that performed using well-validated prognostic indices and whether the empirical prognosis depends on the experience of the evaluator.

The aim of this study was to determine the prognostic capacity (identification of low risk patients) of the empirical risk assessment in patients with acute symptomatic PE and compare it with the PESI score and the sPESI score.

Method

Design

An observational study was conducted in a cohort of stable and unstable patients with acute symptomatic PE. The prognostic efficacy of the PESI and sPESI indices was compared with the empirical evaluation of the risk of a second-year resident (R2), a third-year resident (R3), a fourth-year resident (R4) of the specialty of Pneumology and of 2 attending physicians (one with experience [A1] and the other without experience [A2] in the management of patients with PE). The study was approved by the local Ethics Committee and all patients gave their consent for participation.

Patients and selection criteria

All patients diagnosed consecutively of acute symptomatic PE in the Emergency Department of the Ramón y Cajal Hospital, Madrid, Spain, were included in the study for one year. The diagnosis of PE was confirmed by the finding in the CT angiography of a partial intraluminal defect surrounded by contrast or a complete occlusion of a pulmonary artery in 2 consecutive CT cuts.[17] The diagnosis of PE by ventilation/perfusion scintigraphy was made in high probability cases defined according to the PIOPED criteria[18] (at least one segmental perfusion defect or 2 subsegmental with normal ventilation), or in cases with clinical suspicion of PE, inconclusive scintigraphy and lower limb diagnostic ultrasound showing a compressibility defect of venous lumen as a sign of deep vein thrombosis (DVT).[19]

We excluded patients without an objective diagnosis of PE, those who could not complete a minimum follow-up of one month from the time of diagnosis and asymptomatic patients in whom the diagnosis of PE was made incidentally.

Interventions

Patients were treated with weight-adjusted doses of enoxaparin (1 mg/kg every 12 h) for a minimum of 5 days. Administration of vitamin K antagonists was initiated along with LMWH between the first and the third day of treatment and LMWH was discontinued when the international normalized ratio (INR) was stable and higher than 2.0. INR level monitoring was carried out in accordance with the local practices of the center.

The recanalization treatment (thrombolytics, fragmentation or embolectomy) was used in hemodynamically unstable patients at the discretion of the physician in charge. In general, mechanical fragmentation and embolectomy were reserved for unstable patients with contraindication for thrombolysis. A vena cava filter was inserted in those patients with contraindication for anticoagulation therapy (active bleeding or high risk of bleeding).

Prognostic evaluation

The PESI and sPESI risk scores were calculated based on the clinical characteristics of the patients collected at the time of diagnosis of PE in the Emergency Department. The score established in each of the prognostic indices was assigned to each of the variables. The total score of each patient was calculated by adding the scores obtained for each of the prognostic variables included in the index.

For the empirical prognostic evaluation, the participating physicians received information about the patient's comorbidities, medical records and signs present on examination at the time of diagnosis. They were not provided with information on other prognostic tools, such as echocardiography or biologic markers.[20–22]