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Pulmonary embolism severity index accurately predicts long-term mortality rate in patients hospitalized for acute pulmonary embolism

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Background: The Pulmonary Embolism (PE) Severity Index (PESI) is a clinical prognostic rule that accurately classifies PE patients in five risk classes with increasing mortality. PESI score has been validated in studies with a relatively large number of patients. It is unclear whether the PESI score may also be an accurate tool to define the 6-month and one-year mortality rates in PE patients.

Methods: Consecutive patients admitted to the tertiary hospital of Varese (Italy) with an objectively diagnosed PE between January 2005 and December 2009 were included. Information on clinical presentation, diagnosis of PE, treatment follow-up, risk factors, treatment, and mortality during a 1-year follow-up was collected.

Results: 538 patients were enrolled in this study. Mean age was 70.6 ± 12.3 years, 44.4% of patients were male, and 27.9% had known cancer. One-year follow up was available for 96.1% of patients. Overall mortality rate was 23.2% at 3 months, 30.2% at 6 months and 37.1% at 12 months. The discriminatory power of the PESI score on prediction of long-term mortality was 0.69 (78% at 3 months, 68% at 6 months, 60% at 12 months). The ROC curve, calculated by the original PESI at 3 and 6 months, but this was significantly lower at one year.

Conclusions: The results of this study suggest that PESI score is an accurate tool to define the 6-month and one-year mortality rates in PE patients.

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Combined value of heart-type fatty acid-binding protein and myocardial creatine kinase in risk stratification of normotensive patients with pulmonary embolism

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Background: Risk assessment of stable patients with pulmonary embolism remains challenging. In this context the combined prognostic utility of heart-type fatty acid-binding protein (h-FABP), creatine kinase isoenzyme MB (CK-MB) and troponin I (TnI) in patients with pulmonary embolism is uncertain.

Methods: We included 161 consecutive normotensive (systolic blood pressure above 90mm Hg) patients with confirmed PE. The combined utility of echocardiographic signs of right ventricular dysfunction and several biomarkers (troponin I, creatine kinase isoenzyme MB, heart-type fatty acid-binding protein) was studied. The primary endpoint was defined as death occurred within 30 days after admission to hospital.

Results: Elevated biomarkers were measured 26 patients (16.1%) for h-FABP, in 69 (43.5%) for CK-MB and in 24 (15.5%) for troponin I. Echocardiography revealed right ventricular dysfunction (RVD) in 70 (43.5%) patients. Overall, 16 patients (9.9%) died compared to the study. In the h-FABP positive group 15 (57.7%) patients died compared to 13 (19.7%) patients in the h-FABP positive group and 15 (37.5%) patients in the CK-MB positive group (h-FABP vs. TnI, p = 0.003; h-FABP vs. CK-MB, p = 0.01; TnI vs. CK-MB, p = 0.04). Elevated biomarkers demonstrated to correlate with the primary endpoint with h-FABP being strongly, CK-MB moderately and TnI weakly associated with short term death (h-FABP r = 0.701, p < 0.001; CK-MB r = 0.486, p = 0.001; TnI r = 0.272, p = 0.001). In multivariate logistic regression analysis a positive h-FABP test (OR 27.1, 95% CI 2.1 to 352.3, p = 0.001), elevated CK-MB levels (OR 5.3, 95% CI 1.3 to 23.3, p = 0.002) and a low systolic blood pressure on admission (OR 1.2, 95% CI 1.1 to 1.3, p = 0.001) emerged as independent predictors of 30-day mortality.

Conclusions: Both h-FABP and CK-MB are associated with short term mortality in normotensive patients with PE with h-FABP as the biomarker with the strongest predictive value. Thus h-FABP could be advantageous for risk stratification in this intermediate risk group.

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Simplified pulmonary embolism severity index calculated at hospital admission predicts both in-hospital mortality and all cause mortality at follow up in acute pulmonary embolism

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Introduction: Simplified Pulmonary Embolism Severity Index (sPESI) is a new friendly-user prognostic assessment tool that successfully predicts 30-day mortality after acute pulmonary embolism (APE). However, sPESI has not yet been tested to predict long term prognosis after APE. Thus, the aim of this study was to assess the impact of sPESI evaluated at hospital admission on both in-hospital and after discharge prognosis in patients with APE diagnosed by multislice computed tomography (MSCT).

Methods and population: Retrospective, observational study that included all patients with APE diagnosed by MSCT during emergency room (ER) stay in the year of 2010. Blood tests and clinical data were obtained at hospital admission. The primary endpoint was in-hospital death of all causes. Secondary endpoint was all-cause death at follow up. Chi-square test was used to test the prediction of sPESI score on all cause in-hospital mortality. A Cox regression model was used to compare all cause mortality at 18 months of follow up between the different scores of sPESI.

Results: Between January and December 2010, 218 patients were diagnosed with APE by MSCT (age 73±16 years, 102 (47%) males). 189 patients had reliable clinical data enabling calculation of sPESI score at hospital admission. 45 (23.8%) patients had a sPESI of 0, 77 (40.7%) patients had a sPESI of 1, 50 (26.4%) patients had a sPESI of 2, 14 (7%) patients had a sPESI of 3, 2 (1%) patients had a sPESI of 4 and just 1 (0.5%) patient had a sPESI of 5. Comparing with the group of patients with sPESI 0 we found the following odds ratios (OR): sPESI group 1 OR 4.400 [95% confidence interval (CI) 0.523 – 36.987, p value = 0.139], sPESI group 2 OR 7.163 [95% CI 0.845 – 60.699, p value =0.04], sPESI group 3 OR 12.000 [95% CI 1.136 – 126.792, p value = 0.013]. For the outcome of all cause mortality after discharge, it was found that the higher the score of sPESI the lower the event-free survival was, for each unit increase in sPESI score, the hazard ratio (HR) was 2.645 (CI 1.64 – 4.255, p value ≤ 0.01).

Conclusion: sPESI score calculated at hospital admission predicts not only in-hospital all-cause mortality but also all-cause mortality at 18 months after discharge.

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Comparative survival of operable chronic thromboembolic pulmonary hypertension patients as compared to inoperable medically treated or untreated patients

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Background: Pulmonary endarterectomy (PEA) is the treatment of choice for chronic thromboembolic pulmonary hypertension (CTEPH) patients. It is unclear whether the outcome of patients with inoperable CTEPH is influenced by the use of pulmonary arterial hypertension (PAH)-specific drugs.

Aim: To compare the survival of operable chronic thromboembolic pulmonary hypertension who were treated medically with specific PAH drugs (INOP-MT) and a control group of inoperable untreated CTEPH patients (INOP-MC).

Methods: Between July 1996 and February 2013 we included 261 consecutive patients with CTEPH. All patients underwent right heart catherization and 6-minute walk test (6MWT).

Results: The mean follow-up period was 43±37 months. One hundred and nine patients were included in the OP-PEA group, 118 in the INOP-MT group and 34 in the INOP-C group. The INOP-MT group, 94 patients received phosphodiesterase type-5 inhibitors, 36 endothelin receptor antagonists, 5 prostanoids and 23 combination therapy. Age was 63±14, 64±17 and 57±16 years in OP-PEA, INOP-MT and INOP-C respectively (P = 0.063 and < 0.001 for OP-PEA vs INOP-C and INOP-MT respectively). Baseline 6MWT was 324±125, 354±138 and 387±123 m in INOP-C, INOP-MT and OP-PEA respectively (P = 0.042 and 0.002 for OP-PEA vs INOP-MT and INOP-C respectively). Pulmonary Vascular Resistance was 9.9±5.9, 9.8±4.9 and 9.7±0.4 WU in INOP-C, INOP-MT and OP-PEA respectively (NS). Kaplan-Meier survival of the three groups is reported in the table.

<table>
<thead>
<tr>
<th>Survival</th>
<th>1 year</th>
<th>3 years</th>
<th>5 years</th>
<th>10 years</th>
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<tr>
<td>INOP-C*</td>
<td>81%</td>
<td>75%</td>
<td>69%</td>
<td>26%</td>
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<tr>
<td>INOP-MT*</td>
<td>85%</td>
<td>80%</td>
<td>70%</td>
<td>55%</td>
</tr>
<tr>
<td>OP-PEA</td>
<td>87%</td>
<td>86%</td>
<td>85%</td>
<td>74%</td>
</tr>
</tbody>
</table>

*P<0.01 vs OP-PEA, **P<0.05 vs INOP-C and OP-PEA.

Conclusions: OP-PEA patients were younger, with a better baseline exercise capacity and had the best long term survival as compared to the inoperable groups.