„In-hospital major bleeding predicts mortality in patients with objectively confirmed pulmonary embolism"

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on behalf of ZATPOL Registry Investigatores

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Warsaw, Poland
Declaration of potential conflict of interest:

none
Background

The Worcester Venous Thromboembolism Study

• Retrospective analysis of medical records of patients with VTE
• F-UP maximum 3 years
• **Bleeding predicts mortality**
  (HR 1.97; 95%CI 1.57-2.47)

Findings from RIETE Registry

• Prospective multicenter registry of patients with VTE
• F-UP 3 months
• **Bleeding predicts mortality**
  (HR 2.6; 95%CI 2.2-3.0)


Prandoni P et al. *J Thromb Haemost* 2010; 8: 2575-2577
Background

Pulmonary embolism population: at risk for worse outcomes?

In-hospital bleeding complications: influence on outcomes?
To assess whether in-hospital major bleeding predicts:

- in-hospital mortality
- 90-day mortality

in patients admitted to cardiology departments due to confirmed PE according to validated diagnostic criteria
Methods

• ZATPOL Registry data analysis

  – Prospective registry of consecutive patients hospitalized due to acute pulmonary embolism suspicion in cardiology departments across Poland from January 2007 to September 2008.

  – Results of in-hospital evaluation, diagnostic assessment, treatment, bleeding data and risk factors for both PE and bleeding reported through standardized web-based questionnaire and revised by central reviewers.
Methods

- Additional questionnaires sent to 34 centers, which reported bleeding in order to obtain complete information and qualify complications according to International Society of Thrombosis and Haemostasis definition of bleeding

86 actively reporting centers
- 21 (25%) university hospitals
Results

2015 patients with PE suspicion included in ZATPOL Registry

1316 patients with PE diagnosed by local coordinators

1112 patients with objectively confirmed PE by validated diagnostic criteria according to ESC guidelines

Age 66.3 ±15.2 years
42.4% male patients
15.1% in shock or hypotension

Treatment:
• 10.4% thrombolytic treatment
• 69.1% LMWH or pentasacharide
• 47.7% UFH

Comorbidities:
• CAD 31.1%
• CHF 21.8%
• Cancer 14.9%
• Renal insufficiency 1.6%
Results

67 (6%) bleeding complications:
- 40 (3.6%) major bleedings
- 27 (2.4%) non-major bleedings

International Society of Thrombosis and Haemostasis definition of bleedings:
- Major
  - Fatal bleeding
  - Symptomatic bleeding in a critical area or organ, such as intracranial, intraocular, retroperitoneal, intraarticular, pericardial or intramuscular with compartment syndrome
  - Bleeding causing a fall in hemoglobin of 2 g/dl or more, or leading to transfusion of two or more units of blood or red cells
- Non-major
  - All other bleedings

Mean ↓Hgb concentration:
- Major – 3.9 g/dl (SD 2.44)
- Non-major – 0.76 g/dl (SD 0.78)
Results

Thrombolytic treatment  
n=121

29 (24%) bleeding complications  
• 23 (19%) major bleedings  
  [5 (4.1%) fatal bleedings]

Non-thrombolytic treatment  
n=991

38 (3.8%) bleeding complications  
• 17 (1.7%) major bleedings  
  [1 (0.1%) fatal bleeding]
## Results

<table>
<thead>
<tr>
<th>Study endpoint</th>
<th>No bleedings N=1045</th>
<th>Non-major bleedings N=27</th>
<th>Major bleedings N=40</th>
<th>All N=1112</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-hospital mortality</td>
<td>63 (6%)</td>
<td>4 (14.8%)</td>
<td>12 (30%)</td>
<td>79 (7.1%)</td>
</tr>
<tr>
<td>3-month mortality</td>
<td>113 (10.8%)</td>
<td>4 (14.8%)</td>
<td>17 (42.5%)</td>
<td>134 (12%)</td>
</tr>
</tbody>
</table>

5 fatal bleeding complications
7 cases of fatal pulmonary embolism

1 fatal re-bleeding
1 death due to neoplastic disease
1 case of sudden cardiac death
1 death of unknown reason
# Results

<table>
<thead>
<tr>
<th>Independent predictor of in-hospital mortality</th>
<th>OR [95%CI]</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock or hypotension due to PE</td>
<td>7.45 [4.42-12.57]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Major bleeding versus no bleeding</strong></td>
<td>3.47 [1.51-7.95]</td>
<td>0.003</td>
</tr>
<tr>
<td>Presence of ≥1 concomitant disease</td>
<td>2.59 [1.54-4.37]</td>
<td>&lt;0.001</td>
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<tr>
<td>• CHF</td>
<td></td>
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<tr>
<td>• AF</td>
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<tr>
<td>• Stroke</td>
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<tr>
<td>• Chronic pulmonary disease</td>
<td></td>
<td></td>
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<tr>
<td>• History of MI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>1.90 [1.02-3.53]</td>
<td>0.044</td>
</tr>
</tbody>
</table>

Age, sex, body weight, renal insufficiency, non-major bleeding – P>0.1
## Results

<table>
<thead>
<tr>
<th>Independent predictor of 90-day mortality</th>
<th>OR [95%CI]</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock or hypotension due to PE</td>
<td>5.23 [3.32-8.25]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cancer</td>
<td>3.57 [2.22-5.75]</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Major bleeding versus no bleeding</strong></td>
<td>2.75 [1.29-5.87]</td>
<td>0.009</td>
</tr>
<tr>
<td>Presence of ≥1 concomitant disease</td>
<td>2.01 [1.32-3.08]</td>
<td>0.001</td>
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<tr>
<td>• CHF</td>
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<tr>
<td>Age &gt; 71 years (median)</td>
<td>1.5 [0.98-2.31]</td>
<td>0.063</td>
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Sex, body weight, renal insufficiency, non-major bleeding – P>0.1
Conclusion

- In-hospital major bleeding is a strong predicting factor of in-hospital and 90-day mortality in patients with objectively confirmed pulmonary embolism.
Thank You!
THANK YOU FOR YOUR ATTENTION!