Press Conference

Title
Bedside Mental status assessment as an independent correlate of mortality in elderly patients admitted for acute coronary syndromes

Presenter
Farzin Beygui

Authors
Clément Briet, Katrien Blanchart, Vincent Roule, Mathieu Bignon, Adrien Lemaître, Pierre Ardouin, Remi Sabatier, Farzin Beygui

Department of Cardiology and EA4650, Caen University Hospital & Normandie Université, Caen, France; ACTION academic research group, Paris France

ESC Congress Munich 2018
Declaration of interest

- Research contracts (Medtronic, Boston scientific, Biosensor, AstraZeneca)
Age is associated with:

- High rates of ACS: >30% of patients admitted for ACS > 75 y
- High risk of mortality after ACS
  - > 50% of in-hospital death occurs in > 75 y
  - Compared to those <85, the risk of mortality is 3 to 9 times higher after age 85.
- High prevalence of dementia and in-hospital delirium/confusion.
- A significant association between atherosclerosis and dementia has been previously reported supporting a possible link between coronary artery disease and mental status.
The Mini-Mental State Examination (MMSE) and the Confusion Assessment Method (CAM) are used on routine basis for the screening and the assessment of the severity of dementia and confusion respectively in clinical and research settings.

### The Mini-Mental State Exam

<table>
<thead>
<tr>
<th>Patient</th>
<th>Examiner</th>
<th>Date</th>
</tr>
</thead>
</table>

**Maximum Score**

<table>
<thead>
<tr>
<th>Orientation</th>
<th>5 ( )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>5 ( )</td>
</tr>
<tr>
<td>Attention and Calculation</td>
<td>5 ( )</td>
</tr>
<tr>
<td>Recall</td>
<td>3 ( )</td>
</tr>
<tr>
<td>Language</td>
<td>2 ( )</td>
</tr>
</tbody>
</table>

- **Orientation**: What is the (year) (season) (date) (day) (month)?
- **Registration**: Name 3 objects; 1 second to say each. Then ask the patient all 3 after you have said them. Give 1 point for each correct answer. Then repeat them until he/she learns all 3. Count trials and record.
- **Attention and Calculation**: Sens! 7; 1 point for each correct answer. Stop after 5 answers. Alternatively spell "world" backward.
- **Recall**: Ask for the 3 objects repeated above. Give 1 point for each correct answer.
- **Language**: Name a pencil and watch.
  - Repeat the following "No "sit, and, or buts".
  - Follow a 3-stage command: "Take a paper in your hand, fold it in half, and put it on the floor."
  - Read and obey the following: CLOSE YOUR EYES
  - Write a sentence.
  - Copy the design shown.

**Total Score**

ASSESS level of consciousness along a continuum:

- Alert
- Drowsy
- Stupor
- Coma

### The diagnosis of delirium by CAM requires the presence of BOTH features A and B

#### A.

- **Acute onset**: Is there evidence of an acute change in mental status from patient baseline?
- **Fluctuating course**: Does the abnormal behavior:
  - Come and go?
  - Fluctuate during the day?
  - Increase/decrease in severity?

#### B.

- **Inattention**: Does the patient:
  - Have difficulty focusing attention?
  - Become easily distracted?
  - Have difficulty keeping track of what is said?

### AND the presence of EITHER feature C or D

#### C.

- **Disorganized thinking**: Is the patient’s thinking
  - Disorganized?
  - Incoherent?
  - For example does the patient have
  - Rambling speech/irrelevant conversation?
  - Unpredictable switching of subjects?
  - Unclear or illogical flow of ideas?

#### D.

- **Altered level of consciousness**: Overall, what is the patient’s level of consciousness?
  - Ailen (normal)
  - Vigilant (hyper-alert)
  - Lethargic (drowsy but easily roused)
  - Stuporous (difficult to rouse)
  - Comatose (unrousable)
Purpose & Methods:

Purpose
• to assess the impact of mental status on outcomes after ACS in elderly patients.

Methods:
• Prospective, open, ongoing cohort of patients ≥ 75 years old admitted for an ACS (STEMI, NSTEMI or unstable angina) to the cardiology department of the University Hospital of CAEN.
• Cognitive impairment was defined in the presence of any of the following criteria:
  • Abnormal CAM
  • Age and education level-weighted MMSE < 25th percentile
• Follow-up was completed at 3 months and 1 year in all patients
• The primary outcome of the study was total mortality at 1-year follow-up.
• The secondary endpoints assessed at hospital discharge and 3 months follow-up:
  • Death, Rehospitalization, Major bleeding (BARC type ≥3 ).
Results 1: demographics and 1 year survival in 600 patients > 75 y

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Cog impairment</th>
<th>Cog impairment</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>N= 428 (71%)</td>
<td>N=172 (29%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>82±4.7</td>
<td>82.7±4.7</td>
<td>0.12</td>
</tr>
<tr>
<td>Male gender</td>
<td>243(56.8)</td>
<td>92(53.4)</td>
<td>0.45</td>
</tr>
<tr>
<td>Primary school</td>
<td>313(73.5)</td>
<td>107(62.6)</td>
<td>0.008</td>
</tr>
<tr>
<td>STEMI</td>
<td>147(34.3)</td>
<td>69(40.2)</td>
<td>0.18</td>
</tr>
<tr>
<td>BMI, kg.m$^{-2}$</td>
<td>26.6±4.4</td>
<td>25.6±4.8</td>
<td>0.02</td>
</tr>
<tr>
<td>Killip Class&gt;1</td>
<td>118(27.7)</td>
<td>68(38.7)</td>
<td>0.0042</td>
</tr>
<tr>
<td>GRACE score</td>
<td>172.5±26.4</td>
<td>184.7±27.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>CRUSADE score</td>
<td>39.5±21.7</td>
<td>43.6±14.6</td>
<td>0.0007</td>
</tr>
<tr>
<td>MMSE score</td>
<td>26.07±2.47</td>
<td>19.30±4.50</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Abnormal CAM</td>
<td>0(0)</td>
<td>19(10.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Revascularization</td>
<td>309(72.2)</td>
<td>100(58.1)</td>
<td>0.0008</td>
</tr>
</tbody>
</table>
### Results 2: Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>All patients</th>
<th>No cognitive impairment</th>
<th>Cognitive impairment</th>
<th>Unadjusted OR(CI)</th>
<th>p</th>
<th>Adjusted OR(CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In-hospital</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding BARC≥ 3, n (%)</td>
<td>27(4.5)</td>
<td>14(3.3)</td>
<td>13(7.5)</td>
<td>2.49(1.14; 5.43)</td>
<td>0.02</td>
<td>2.2(1.008; 4.9)</td>
<td>0.048</td>
</tr>
<tr>
<td>Death, n (%)</td>
<td>16(2.7)</td>
<td>8(1.9)</td>
<td>8(4.6)</td>
<td>2.93(1.047; 8.22)</td>
<td>0.04</td>
<td>3.4(0.9; 12.5)</td>
<td>0.065</td>
</tr>
<tr>
<td><strong>3 months follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death, n (%)</td>
<td>51(8.9)</td>
<td>24(5.8)</td>
<td>27(16.2)</td>
<td>3.21(1.79; 5.75)</td>
<td>&lt;0.0001</td>
<td>2.57(1.34; 4.9)</td>
<td>0.0047</td>
</tr>
<tr>
<td>Cardiovascular death (%)</td>
<td>34(5.9)</td>
<td>15(3.6)</td>
<td>19(11.6)</td>
<td>3.5(1.7; 7.03)</td>
<td>&lt;0.0001</td>
<td>3(1.4; 6.4)</td>
<td>0.0045</td>
</tr>
<tr>
<td>Rehospitalization (%)</td>
<td>180(31.4)</td>
<td>116(28)</td>
<td>64(40)</td>
<td>1.70(1.16; 2.50)</td>
<td>0.0061</td>
<td>1.6(1.09; 2.4)</td>
<td>0.016</td>
</tr>
<tr>
<td>For cardiovascular causes, n (%)</td>
<td>107(18.7)</td>
<td>67(16.2)</td>
<td>40(25)</td>
<td>1.72(1.10; 2.68)</td>
<td>0.016</td>
<td>1.6(1.02; 2.6)</td>
<td>0.04</td>
</tr>
<tr>
<td>For recurrent ACS, n (%)</td>
<td>54(9)</td>
<td>36(7)</td>
<td>18(10.3)</td>
<td>1.27(0.70; 2.30)</td>
<td>0.42</td>
<td>1.29(0.7; 2.37)</td>
<td>0.41</td>
</tr>
<tr>
<td>For heart failure, n (%)</td>
<td>85(14.9)</td>
<td>51(12.4)</td>
<td>34(21.5)</td>
<td>1.90(1.18; 3.07)</td>
<td>0.008</td>
<td>1.8(1.07; 3.05)</td>
<td>0.03</td>
</tr>
<tr>
<td>Bleeding BARC≥3, n (%)</td>
<td>44(7.3)</td>
<td>32(7.5)</td>
<td>12(6.9)</td>
<td>0.85(0.41; 1.71)</td>
<td>0.64</td>
<td>0.86(0.42; 1.7)</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>1 year follow-up</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death, n (%)</td>
<td>92(15.3)</td>
<td>43(10.5)</td>
<td>49(28.6)</td>
<td>3.24(2.14; 4.9)</td>
<td>&lt;0.0001</td>
<td>2.35(1.53; 3.58)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Models adjusted on age, sex, ST-elevation myocardial infarction versus other presentation, **revascularization**, **GRACE Score**, Killip class. Bleeding models were adjusted on the CRUSADE score.
Conclusions & key points

Our study shows that in an elderly population (≥75 y) admitted for ACS

• #30% of patients suffer from cognitive impairment defined by reduced MMSE or delirium detected by CAM.

• Such condition is associated with higher risks of mortality, bleeding and re-hospitalization.

• The relationship with outcomes is independent of other major correlates of such events.

• The bedside assessment of mental status early after admission allows further identification of patients at risk in an already high risk population and may be considered by physicians on routine basis in such patients.

• Our results warrant further studies to assess whether the detection of cognitive impairment and the subsequent specific management may lead to improved outcome in the elderly ACS population.