Isolated Cardiac Troponin Rise Does Not Modify the Prognosis in Elderly Patients with Hip Fracture

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CONFLICT OF INTEREST DISCLOSURE

I have no potential conflict of interest to report
INTRODUCTION

Hip fracture:
- frequent geriatric condition (1.6 million patients/year worldwide)
- poor prognosis (20-30% one year mortality) notably due to cardio-vascular complications

Acute myocardial infarction:

Universal definition: troponin elevation in association with electrocardiographic changes, and/or clinical symptoms of ischemia, and/or new wall motion anomalies
- frequent post-operative complication notably in non cardiac surgery.
- Associate with poor prognosis.
- Frequently asymptomatic notably in the elderly population

Le Manach et al. Anesthesiology 2005
Thygesen et al. J. Am Coll Cardiol 2012
Brauer et al. JAMA 2009
INTRODUCTION

The prognostic significance of a cardiac troponin rise remains controversial in elderly patients with hip fracture.

Some studies reported an increase in short and long-term mortality while other did not.

Moreover, these studies did not distinguish Isolated troponin rise and myocardial infarction according to the universal definition.

Chong et al., Age ageing 2009
INTRODUCTION

The aim of our study was to assess the prognostic value of Isolated Troponin Rise (ITR) in elderly patients with hip fracture.
METHODS

June 2009-June 2013 in Pitié-Salpêtrière hospital (Paris)

Inclusion criteria:
- ≥70 years of age
- hip fracture
- post-operative cardiac troponin measurement

Exclusion criteria:
- multiple or metastatic fractures
- redo surgery
- no troponin measurement
METHODS

All data were prospectively collected (age, sex, CIRS, comorbidity, ADL, IADL etc...)

Electrocardiogram (ECG) and cardiac troponin I (cTnI) measurement were routinely performed within the first 3 days after surgery in all patients.

Patients were regrouped according to troponin level and ECG interpretation
- Control group (no significant ECG change and no troponin rise),
- ITR Group (troponin rise without significant ECG changes)
- ACS group (troponin rise with significant ECG changes).
METHODS

The primary end point: 6 month mortality and/or re-hospitalization

Secondary end points:
- acute care and/or rehabilitation mortality
- Post-operative complications
- 30-day readmission
- 6 month functional outcome (ability to walk, ADL and IADL)
- new institutionalization.
RESULTS

Patients admitted for hip fracture (n=365)

Excluded patients
- Absence of troponin measurement (n=39)
- Redo surgery (n=7)
- Pre-existing hospitalization (n=4)
- Pathological fracture (n=3)

Selected patients (n=312)

Control group (n=217, 70%)

ITR group (n=50, 16%)

ACS group (n=45, 14%)
## RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Control (n=217)</th>
<th>Isolated troponin rise (n=50)</th>
<th>Acute coronary syndrome (n=45)</th>
<th>P values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>86±7</td>
<td>87±6</td>
<td>84±9</td>
<td>.09</td>
</tr>
<tr>
<td>Men</td>
<td>58 (27)</td>
<td>11 (22)</td>
<td>14 (32)</td>
<td>.60</td>
</tr>
<tr>
<td>Medical history</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>50 (23)</td>
<td>12 (24)</td>
<td>14 (31)</td>
<td>.52</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>35 (16)</td>
<td>12 (24)</td>
<td>15 (33)*</td>
<td>.02</td>
</tr>
<tr>
<td>Cardiac failure</td>
<td>31 (14)</td>
<td>12 (24)</td>
<td>14 (31)*</td>
<td>.01</td>
</tr>
<tr>
<td>Estimated creatinine clearance &lt; 30 mL/min</td>
<td>21 (10)</td>
<td>15 (30)*</td>
<td>10 (22)*</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Autonomy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No walking disability</td>
<td>125 (58)</td>
<td>26 (52)</td>
<td>15 (33)*</td>
<td>.01</td>
</tr>
</tbody>
</table>
RESULTS: primary end point

Death and/or rehospitalization

Proportion of patients (%) vs Days after admission

- Control: P=0.84
- ITR: P=0.02
- ACS
## RESULTS: secondary end points

<table>
<thead>
<tr>
<th></th>
<th>Control (n=217)</th>
<th>Isolated troponin rise (n=50)</th>
<th>Acute coronary syndrome (n=45)</th>
<th>P values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute care complications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>14 (6)</td>
<td>5 (10)</td>
<td>10 (22)*</td>
<td>.004</td>
</tr>
<tr>
<td>Acute cardiac failure</td>
<td>28 (13)</td>
<td>7 (14)</td>
<td>15 (33)*</td>
<td>.002</td>
</tr>
<tr>
<td>Stroke</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>3 (7)*</td>
<td>.001</td>
</tr>
<tr>
<td>Infection</td>
<td>42 (19)</td>
<td>16 (32)</td>
<td>16 (36)</td>
<td>.02</td>
</tr>
<tr>
<td>Admission into ICU</td>
<td>5 (2)</td>
<td>3 (6)</td>
<td>7 (16)*</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Death during acute care and/or rehabilitation</td>
<td>17 (8)</td>
<td>6 (12)</td>
<td>10 (22)*</td>
<td>.02</td>
</tr>
<tr>
<td>Return to home</td>
<td>180 (83)</td>
<td>36 (72)</td>
<td>25 (27)*</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Readmission within 30 days</td>
<td>11 (5)</td>
<td>0 (0)</td>
<td>7 (17)*</td>
<td>.002</td>
</tr>
<tr>
<td>At 6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No walking disability</td>
<td>55 (31)</td>
<td>13 (31)</td>
<td>9 (27)*</td>
<td>.03</td>
</tr>
<tr>
<td>ADL</td>
<td>5 [2-6]</td>
<td>3 [2-5]</td>
<td>3 [1-5]*</td>
<td>.03</td>
</tr>
</tbody>
</table>
CONCLUSION

Isolated troponin rise
- was not predictive of 6-month death and/or re-hospitalization
- did not significantly influence any other outcomes
  - postoperative complications,
  - admission to ICU
  - new institutionalization
  - walking ability and functional status.

cTnI rise within the context of ACS
- was associated with a significant increase of 6 months death and/or rehospitalization
- and a poorer outcome considering
  - admission to ICU
  - new institutionalization
  - walking inability and functional status
RESULTS: secondary end points

Death

Proportion of patients (%)

Days after admission

- Control
- ITR
- ACS

P=0.87
P=0.06