Influence of Age & Gender on Outcomes in Patients with ST-Elevation Myocardial Infarction Complicated by Ventricular Fibrillation or Tachycardia at a Regional PCI Center

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BACKGROUND

- Ventricular fibrillation (VF) or ventricular tachycardia (VT) complicating ST-elevation myocardial infarction (STEMI) is associated with significantly increased mortality.

- The influence of age and gender on outcomes of patients with VF or sustained VT complicating STEMI in the PCI era has not been completely studied.

- Identifying patients at risk for VF or VT in the setting of STEMI is an important public health issue.

RESULTS

- From March 2005 to December 2014, 483 consecutive patients were included in the current STEMI network dataset.

- Multivariate ventricular fibrillation or ventricular tachycardia (VT) was independently associated with inhospital mortality (HR, 3.86; 95% CI, 1.99 to 7.48).

CONCLUSIONS

- Patients with VF or VT complicating STEMI have significantly increased mortality.

- Neutrophil-to-lymphocyte ratio is age- and gender-dependent.

- Non-STEMI or STEMI complications are more prevalent in the age 60 years and older group.

- Mortality during hospitalization is higher in males and females in the age 60 years and older group.

- Male gender and lower age are significant predictors of mortality in the age 60 years and older group.
Methods

- The Minneapolis Heart Institute “Level I STEMI” program is a regional STEMI network that was instituted in March 2003, and follows patients prospectively, with follow-up data to five years.
- We searched the database for all patients presenting from March 2005 to December 2014 with VF/VT complicating STEMI.
- In these patients, we evaluated the incidence, patient characteristics & outcomes based on age & gender.

Results

- From March 2005-December 2014, 4001 consecutive patients were enrolled in the Level I STEMI network database.
- VF or VT prior to PCI occurred in 233 (6%) patients including VF (n= 189) and VT (n=44).
- 108 (46%) patients were age < 60 years, while 125 (54%) were age ≥ 60 years.
- 172 (74%) patients were males, while 61 (26%) were females.
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### Age < 60 vs Age ≥ 60

<table>
<thead>
<tr>
<th></th>
<th>All Patients (n=108)</th>
<th>Males (n=89)</th>
<th>Females (n=19)</th>
<th>All Patients (n=125)</th>
<th>Males (n=83)</th>
<th>Females (n=42)</th>
<th>P-Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years), mean (SD)</td>
<td>52 ± 6</td>
<td>52 ± 6</td>
<td>51 ± 7</td>
<td>73 ± 9</td>
<td>72 ± 9</td>
<td>75 ± 9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Male, (%)</td>
<td>89 (82)</td>
<td>-----</td>
<td>-----</td>
<td>83 (66)</td>
<td>-----</td>
<td>-----</td>
<td>0.006</td>
</tr>
<tr>
<td>Prior PCI/M/IABG, (%)</td>
<td>15 (14)</td>
<td>12 (14)</td>
<td>3 (16)</td>
<td>45 (36)</td>
<td>33 (40)</td>
<td>12 (29)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Killip Class I, (%)</td>
<td>65 (60)</td>
<td>57 (64)</td>
<td>8 (42)</td>
<td>77 (62)</td>
<td>50 (61)</td>
<td>27 (64)</td>
<td>0.77</td>
</tr>
<tr>
<td>Current Smoker, (%)</td>
<td>66 (61)</td>
<td>57 (64)</td>
<td>9 (47)</td>
<td>19 (16)</td>
<td>12 (15)</td>
<td>7 (18)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diabetes, (%)</td>
<td>9 (9)</td>
<td>7 (8)</td>
<td>2 (11)</td>
<td>20 (17)</td>
<td>16 (19)</td>
<td>4 (11)</td>
<td>0.07</td>
</tr>
<tr>
<td>Pre-hospital Arrest, (%)</td>
<td>34 (32)</td>
<td>28 (32)</td>
<td>6 (32)</td>
<td>51 (41)</td>
<td>35 (43)</td>
<td>16 (38)</td>
<td>0.13</td>
</tr>
<tr>
<td>Number of Shocks &lt;3, (%)</td>
<td>58 (55)</td>
<td>51 (58)</td>
<td>7 (39)</td>
<td>80 (65)</td>
<td>51 (62)</td>
<td>29 (69)</td>
<td>0.13</td>
</tr>
<tr>
<td>≥3, (%)</td>
<td>48 (45)</td>
<td>37 (42)</td>
<td>11 (61)</td>
<td>44 (36)</td>
<td>31 (38)</td>
<td>13 (31)</td>
<td></td>
</tr>
<tr>
<td>Hypothermia, (%)</td>
<td>31 (29)</td>
<td>26 (29)</td>
<td>5 (26)</td>
<td>48 (38)</td>
<td>36 (43)</td>
<td>12 (29)</td>
<td>0.12</td>
</tr>
<tr>
<td>New ICD, (%)</td>
<td>4 (4)</td>
<td>3 (3)</td>
<td>1 (6)</td>
<td>19 (16)</td>
<td>15 (18)</td>
<td>4 (10)</td>
<td>0.003</td>
</tr>
<tr>
<td>In-hospital Mortality, (%)</td>
<td>15 (14)</td>
<td>12 (14)</td>
<td>3 (16)</td>
<td>41 (33)</td>
<td>26 (31)</td>
<td>15 (36)</td>
<td>0.001</td>
</tr>
<tr>
<td>Mortality post discharge to 1 Year, (%)</td>
<td>2 (2)</td>
<td>2 (3)</td>
<td>0 (0)</td>
<td>5 (6)</td>
<td>2 (4)</td>
<td>3 (11)</td>
<td>0.26</td>
</tr>
</tbody>
</table>

*P-values are comparing age < 60 & age ≥ 60.

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### Females Presenting with STEMI & VF or VT

- **In-Hop death (%)**: p = 0.006
- **Current smoker (%)**: p < 0.001
- **Prior CAD (%)**: p = 0.003

### Males Presenting with STEMI & VF or VT

- **In-Hop death (%)**: p = 0.011
- **Current smoker (%)**: p < 0.001
- **Prior CAD (%)**: p < 0.001
Conclusions

• Regarding Gender:
  o Gender did not significantly influence mortality.
  o Among patients < 60 years old, only 18% are females whereas in patients ≥ 60 years old, 34% are females.

• Regarding Age:
  o Nearly half of the patients with VF/VT were younger than 60 years.
  o Hospital mortality is 14% in the age < 60 group vs. 33% in age ≥ 60.
  o For patients ≥ 60 years old, preexisting coronary artery disease with prior revascularization was more prevalent.
  o A new ICD device was rarely implanted in the age < 60 group (4%) vs. 16% for age ≥ 60.
  o Cigarette smoking was present in 61% of patients <60 years old vs. 16% in patients ≥ 60 years old.

• Additional Observations:
  o The incidence of VF/VT among our contemporary STEMI population is 6%.
  o A substantial proportion of patients required ≥ 3 shocks.
  o Post discharge mortality is low in both groups.
  o The majority of patients (60%) of all ages were Killip class 1 on admission.
  o Cigarette smoking may have an association with VT/VF in younger patients with STEMI.
References