Progression of Left Ventricular Hypertrophy After ST-Elevation Myocardial Infarction Predicts the Recurrence of The Myocardial Infarction

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**Backgrounds & Purpose**

- Left ventricular hypertrophy (LVH) has been known as an independent predictor of adverse cardiovascular events in various etiologies.
- We have previously reported that LVH at admission was associated with increased rate of adverse clinical outcomes in 30-day survivors after ST-elevation myocardial infarction (STEMI), who underwent successful percutaneous coronary intervention (PCI).
- Prognostic significance between progression of LVH and clinical outcomes in patients with STEMI is not yet established.
- In the present study, we investigated the prognostic impact of progression of LVH in patients with STEMI.

**Methods**

- **Subjects**
  200 patients with STEMI (133 males, 56 ±11 year-old), who underwent successful PCI
- **Transthoracic echocardiography**
  - Baseline: within 48-hr after primary PCI
  - Follow-up: between 12 and 36 months after index STEMI
  
  \[ LVM \ (g) = 0.8 \times (1.04 \times \left[ (LVIDd + PWd + SWd)^2 - LVIDd^2 \right]) + 0.6 \]  
- **Measurement of left ventricular mass (LVM)**
  - LVM was calculated according to Devereux’s formula
- **Definition of LVH**
  ≥ 115 g/m² in male and ≥ 95 g/m² in female according to the guidelines of the American Society of Echocardiography (2005)
- **Definition of progression of LVH**
  ≥ 10% increment of LVMI compared with the baseline LVM.
- **End-points of study**
  1st occurrence of major adverse cardiac events (MACE’s) within 5-years: death, recurrent myocardial infarction, target vessel revascularization, hospitalization to heart failure
- **Statistics**
  - Continuous variables were compared by using analysis of unpaired Student’s t test and categorical variables were compared by using Pearson Chi-square test.
  - Cox-regression analysis was performed to assess independent factors associated with MACEs and each individual outcomes

**Summary and Conclusions**

- Increased LVMI was an independent predictor for adverse events, especially for recurrent MI, in patients with STEMI who received successful coronary intervention.
- This findings suggested that the continuous efforts to prevent progression of LV mass might be important in the survivors after STEMI.

**Table 1. Baseline Clinical Characteristics**

<table>
<thead>
<tr>
<th>Variables</th>
<th>No Progression (n = 145)</th>
<th>Progression (n = 55)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year-old)</td>
<td>58 ± 12</td>
<td>55 ± 11</td>
<td>0.133</td>
</tr>
<tr>
<td>Men, n (%)</td>
<td>122 (84)</td>
<td>42 (76)</td>
<td>0.237</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>24 ± 3</td>
<td>25 ± 3</td>
<td>0.419</td>
</tr>
</tbody>
</table>

**Medical History**

- Hypertension, n (%) 55 (38) 22 (40) 0.79
- Diabetes Mellitus, n (%) 32 (22) 7 (13) 0.104
- Dyslipidemia, n (%) 17 (12) 7 (13) 0.846
- Previous CVA, n (%) 5 (3) 2 (4) 0.949
- Smoking, n (%) 97 (67) 32 (58) 0.252
- eGFR (ml/min/1.73m²) 82 ± 28 78 ± 25 0.316
- LDL cholesterol (mg/dl ) 106 ± 40 106 ± 29 0.931
- hs-CRP (mg/L) 1.0 ± 2.7 1.0 ± 1.3 0.929

**Medication at discharge**

- Beta-blocker, n (%) 106 (73) 38 (69) 0.575
- RAS blocker, n (%) 142 (98) 51 (93) 0.167
- CCB, n (%) 16 (11) 5 (9) 0.691

**Statistics**

<table>
<thead>
<tr>
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<th>Progression (n = 55)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LVEDD (mm)</td>
<td>50 ± 5</td>
<td>49 ± 5</td>
<td>0.353</td>
</tr>
<tr>
<td>LVESD (mm)</td>
<td>34 ± 6</td>
<td>34 ± 6</td>
<td>0.634</td>
</tr>
<tr>
<td>IVST (mm)</td>
<td>11 ± 2</td>
<td>10 ± 2</td>
<td>0.045</td>
</tr>
<tr>
<td>PWT (mm)</td>
<td>11 ± 2</td>
<td>10 ± 2</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RWT</td>
<td>0.45 ± 0.09</td>
<td>0.4 ± 0.09</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>LVEDV (mL)</td>
<td>91 ± 25</td>
<td>94 ± 24</td>
<td>0.702</td>
</tr>
<tr>
<td>LVESV (mL)</td>
<td>46 ± 16</td>
<td>47 ± 16</td>
<td>0.786</td>
</tr>
<tr>
<td>LV EF (%)</td>
<td>50 ± 10</td>
<td>50 ± 10</td>
<td>0.945</td>
</tr>
<tr>
<td>LV mass (g)</td>
<td>211 ± 58</td>
<td>169 ± 41</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>LVMI (g/m²)</td>
<td>121 ± 30</td>
<td>97 ± 22</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>WMSI</td>
<td>2.7 ± 14.3</td>
<td>1.57 ± 0.34</td>
<td>0.858</td>
</tr>
</tbody>
</table>

**Conclusion**

- Increased LV MI was an independent predictor for adverse events, especially for recurrent MI, in patients with STEMI who received successful coronary intervention.
- This findings suggested that the continuous efforts to prevent progression of LV mass might be important in the survivors after STEMI.