Myocardial infarction (MI) is a life-threatening event and its incidence is increasing worldwide. Survivors of acute MI may experience consequent cardiac complications, which are occasionally fatal. Previous studies revealed that the most powerful predictor of poor prognosis in patients with old MI (OMI) is left ventricular dysfunction (LVD). To overcome the poor prognosis of OMI patients with LVD, prophylactic implantable cardioverter defibrillator (ICD) implantation is being increasingly used clinically to prevent sudden cardiac death (SCD) based on positive results in clinical trials, particularly in Western countries. However, it is challenging to determine the actual indication for each patient, because of several problems, including resistance to the implantation of a foreign body, the patient’s financial capabilities, and the socioeconomic benefit. The most fundamental way to address these difficulties is to weigh the risks vs. the benefits of the procedure based on the probability of mortality.

**Table.** Representative Studies Evaluating the All-Cause Mortality of Patients With CAD and Left Ventricular Dysfunction

<table>
<thead>
<tr>
<th>Authors</th>
<th>Trial name</th>
<th>Enrolment period</th>
<th>No. of enrolled patients</th>
<th>Patients’ backgrounds</th>
<th>Annual rate of all-cause death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buxton et al</td>
<td>MUSTT</td>
<td>1990–1996</td>
<td>2,202</td>
<td>CAD+EF ≤40% + NSVT</td>
<td>9.6% (no arrhythmic therapy), 8.4% (arrhythmic therapy)</td>
</tr>
<tr>
<td>Kuga et al</td>
<td>JCAD</td>
<td>2000–2001</td>
<td>291</td>
<td>OMI + EF ≤30%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Tanno et al</td>
<td>Tanno</td>
<td>1997–2001</td>
<td>90</td>
<td>OMI + EF ≤30%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Bardy et al</td>
<td>SCD-HeFT</td>
<td>1997–2001</td>
<td>2,521</td>
<td>Ischemic CHF + EF ≤35%</td>
<td>7.2% (ICD), 8.6% (placebo), 8.3% (amiodarone)</td>
</tr>
<tr>
<td>Solomon et al</td>
<td>VALIANT</td>
<td>1998–2001</td>
<td>14,609</td>
<td>OMI + EF ≤40% and/or CHF</td>
<td>14.8%</td>
</tr>
<tr>
<td>Moss et al</td>
<td>MADIT II</td>
<td>1997–2002</td>
<td>1,232</td>
<td>OMI + EF ≤30%</td>
<td>8.5% (ICD), 11.9% (conventional therapy)</td>
</tr>
<tr>
<td>Hohnloser et al</td>
<td>DINAMIT</td>
<td>1998–2003</td>
<td>676</td>
<td>Recent MI + EF ≤35%</td>
<td>7.9% (ICD), 6.5% (control)</td>
</tr>
<tr>
<td>Ottervanger et al</td>
<td>Zwolle</td>
<td>1994–2004</td>
<td>2,544</td>
<td>OMI + EF ≤30%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Moss et al</td>
<td>MADIT-CRT</td>
<td>2004–2008</td>
<td>1,820</td>
<td>Ischemic cardiomyopathy + EF ≤30%</td>
<td>3.6% (ICD), 3.7% (CRT-D)</td>
</tr>
</tbody>
</table>

CAD, coronary artery disease; CHF, congestive heart failure; CRT-D, cardiac resynchronization therapy with defibrillator; EF, ejection fraction; ICD, implantable cardioverter defibrillator; MI, myocardial infarction; NSVT, non-sustained ventricular tachycardia; OMI, old myocardial infarction.
Thus, the overall advantages of ICD implantation should be carefully determined by further study reflecting all the updated findings and current treatment strategies.

References


5. McMurray JJ, Adamopoulos S, Anker SD, Auricchio A, Bohm M, Dickstein K, et al. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology: Developed in collaboration with the Heart Failure Association (HFA) of the ESC. Eur Heart J 2012; 33: 1787–1847.


