EDITORIAL COMMENT

Improving Quality of Life After Cardiogenic Shock: Do More Revascularization!* 

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The outcome of acute myocardial infarction (AMI) has changed dramatically during the last two decades. Most patients can now expect survival rates of more than 90% (1). The main reason for this enhanced outcome is the active pursuit of reperfusion in AMI with fibrinolytic therapy and primary percutaneous coronary intervention. As we have improved survival, many patients who previously would not have survived are now alive, some with low ejection fraction and symptomatic heart failure (HF). Patients who develop cardiogenic shock during AMI are now the group with highest mortality, accounting for approximately 60% of the mortality observed (2). The landmark trial by the SHould emergently revascularize Occluded Coronaries for Cardiogenic shock (SHOCK) investigators has strongly supported the practice of more aggressive management for these highest-risk patients (3). In this study, the use of early revascularization (ERV) was associated with higher survival compared with immediate medical stabilization (IMS), especially after 30 days, because more patients randomly assigned to IMS died during follow-up (30-day survival: ERV, 53.3%; IMS, 44.0%; p = 0.11; 6-month survival: ERV, 49.7%; IMS, 36.9%; p = 0.027; 1-year survival: ERV, 46.7%; IMS, 33.6%; p < 0.03) (3,4). The outcomes of the SHOCK trial have lead to a class 1A recommendation for an early invasive strategy in AMI complicated by cardiogenic shock for patients who are younger than 75 years of age and a class IIa recommendation for the elderly (>75 years) (5).

However, the use of early revascularization remains underused. Data from the National Registry of Myocardial Infarction identified that only 60% of patients with AMI complicated by cardiogenic shock underwent early revascularization in hospitals with revascularization capability (6). Similarly, we have documented recently from the Can Rapid Risk Stratification of Unstable Angina Patients Suppress ADverse Outcomes with Early Implementation of the American College of Cardiology/American Heart Association Guidelines (CRUSADE) quality improvement initiative that only 49% patients with non–ST-segment elevation MI underwent early revascularization; not surprisingly, the in-hospital mortality among the patients with cardiogenic shock has remained high, at 41% (7).

Why have these impressive outcomes with early revascularization in cardiogenic shock not led to their widespread adoption in practice? Although the answer to this question obviously is multifactorial, there has been a concern that among the sickest patients with AMI, such as those with cardiogenic shock, early revascularization might rescue patients that end up alive but with remnant HF and poor quality of life (QOL). In this issue of the Journal, Sleeper et al. (8) provide further evidence why the early invasive and aggressive approach to cardiogenic shock should be the standard of care. They have clearly demonstrated that early revascularization is associated with better survival and that those patients who live largely have good QOL with few symptoms of HF.

Patients randomly assigned to ERV had better functional status at one year compared with those randomly assigned to IMS. Although the distribution of New York Heart Association (NYHA) functional class was similar by treatment groups, the ERV group had a higher proportion of those with modest functional impairment (NYHA functional class I or II) at two weeks after hospital discharge (ERV, 75.9%; IMS, 62.5%). At one year, 83% of patients discharged alive were in NYHA functional class I or II (ERV, 85%; IMS, 80%). The proportion of NYHA functional class III and IV decreased with more one-year survivors in the ERV group without a proportionate increase in the number of NYHA functional class III or IV patients. Furthermore, fewer patients in the IMS group remained stable because more patients deteriorated or died. When patients assessed their QOL, both the ERV and IMS groups had similarly good overall health satisfaction. At two weeks after discharge, the ERV group had higher Multidimensional Index of Life Quality (MILO) scores with regard to mental health, physical energy and pain, and financial stability, as well as a trend toward a higher Andrews’ Ladder of Life score.

The findings of Sleeper et al. (8) are consistent with previous reports that have shown that a more invasive approach to AMI or acute coronary syndromes is associated with higher survival and improved QOL compared with conservative management (9,10). When the American and Canadian subpopulations in the Global Use of Strategies to Open Occluded Coronary Arteries (GUSTO) trial were compared, the U.S. cohort, who had a substantially higher rate of cardiac catheterization and revascularization, had a higher survival (p = 0.02) as well as better functional status, higher QOL, and less cardiac symptoms one year after AMI (p < 0.001) (11). Other recent trials comparing invasive versus conservative treatment strategies for acute coronary syndromes (e.g., Randomized Intervention Trial of unstable

*Editorials published in the Journal of the American College of Cardiology reflect the views of the authors and do not necessarily represent the views of JACC or the American College of Cardiology.

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Angina [RITA]-3, Fragmin and fast revascularization during instability in coronary artery disease [FRISC-II] have similarly demonstrated a higher health-related QOL (HRQOL) one year after an interventional strategy (9,10).

Although consistent with other studies in AMI on QOL, the findings of Sleeper et al. represent probably the most positive outlook on QOL after cardiogenic shock. The number of patients in their study was 41.7% of the total SHOCK cohort. Thus, the study was somewhat underpowered. Furthermore, only 50.8% (n = 64) of the study sample had sufficient data for the QOL assessments using the MILQ and life satisfaction questionnaires because these questionnaires were valid only if answered by patient and not by proxy. This selection bias would likely strengthen the association between ERV and higher QOL because the sickest individuals who could not provide their QOL were more often from the IMS group, who had lower mental health status and greater death rates after discharge. However, it is reassuring that most patients had few to no symptoms of HF after MI. Because increasing severity of HF has been linked with poorer QOL, it cannot be emphasized enough that most patients randomly assigned to ERV had NYHA functional class I or II at two weeks (75.9%) and at one year (85.2%), indicating the value of early revascularization in preventing significant reduction in left ventricular function with its resultant symptoms of HF.

The SHOCK trial was conducted before the widespread use of device therapy. Cardiac resynchronization therapy gained an important place in standard HF therapy after the early studies demonstrated significant improvement in QOL before data supported any survival benefit (12). Because there were more patients with more severe HF in the IMS group, it is possible that the effect of cardiac resynchronization therapy would have minimized the differences in QOL. Furthermore, the use of implantable cardioverter defibrillator after MI may overall have improved survival after MI, but this therapy has not improved QOL. On the contrary, it has been associated with worse QOL (13) because 24% of patients may suffer from inappropriate shocks, notwithstanding the very clear mortality benefit (14). Thus, as our therapies improve among patients with HF, we can expect improved QOL in conjunction with improved survival, an accomplishment that seemed highly unlikely more than a decade ago for AMI patients with cardiogenic shock.

Elderly patients frequently are more concerned about quality rather than quantity of life. Despite the interaction between age and therapy on survival that was observed in the SHOCK trial, it has been generally accepted in selected elderly patients that early revascularization is associated with improved survival. The authors of the present study did not examine whether QOL or functional status differs between older and younger patients, probably because of the relatively small number of elderly patients in the SHOCK trial (n = 56, age 75 years or older) of which 66.1% already died by six months. It has been argued that older people have less to gain than younger people from preventive and aggressive therapies because of their shorter life expectancy. However, most people value time in the near future more than in the distant future. In a study of patients with HF, older patients (age >65 years) had better HRQOL compared with younger patients (p = 0.005) despite significant functional limitations with worse NYHA functional class (p < 0.001); however, over the course of six weeks, older patients were at risk for worsening QOL with further decline in functional status (mean HRQOL change of −14.4 points vs. +0.3 points, p < 0.001) (15). These results underscore the importance of aiming treatments at maintaining functional status in older persons with HF, which may include early revascularization in AMI with cardiogenic shock.

Because the SHOCK trial is one of few studies in AMI that examines both outcomes of survival and QOL, this important work by Sleeper et al. (8) supports continued aggressiveness of delivering health care to patients with cardiogenic shock. Therefore, early revascularization should be mandated for patients with AMI complicated by cardiogenic shock to improve both survival and QOL. This can occur without increasing the proportion of patients with severe life-limiting HF symptoms. Because survival from AMI has greatly improved over the course of time, future studies will need to focus more on QOL and HF outcomes.

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