Chronic heart failure: a look through the rear view mirror

Eugene Braunwald*

TIMI Study Group, Division of Cardiovascular Medicine, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA 02115, USA

Online publish-ahead-of-print 26 October 2012

This editorial refers to ‘Predicting survival in heart failure: a risk score based on 39 372 patients from 30 studies’, by S.J. Pocock et al., on page 1404

Heart failure is now the most common condition that leads to hospital admission in industrialized nations. Although the overall prognosis for patients with chronic heart failure is still gloomy, and similar to that of many of the most common forms of cancer,1 a combination of pre-clinical and clinical research conducted over the past 25 years has led to five significant advances, each of which has received a IA recommendation in the European Society of Cardiology Guidelines for the treatment of heart failure with reduced ejection fraction.2 These advances, well known to cardiologists, are: (i) blockers of the renin–angiotensin system [angiotensin-converting enzyme (ACE) inhibitors or angiotensin II type I receptor blockers (ARBs)]; (ii) beta-adrenergic blockers; (iii) aldosterone antagonists; (iv) implantation of cardioverter-defibrillators; and (v) the application of cardiac resynchronization therapy in patients with QRS prolongation. Each has been shown to reduce mortality in patients with heart failure. As a consequence, the cumulative benefits of these therapies has improved the prognosis in these patients quite substantially.3

The development of a management plan for individual patients with heart failure (as is the case with many conditions) requires an assessment of prognosis. This has been a challenging task in patients with chronic heart failure. A number of risk scores have been established since 2003 to aid physicians in this task.4 These advances, well known to cardiologists, are: (i) blockers of the renin–angiotensin system [angiotensin-converting enzyme (ACE) inhibitors or angiotensin II type I receptor blockers (ARBs)]; (ii) beta-adrenergic blockers; (iii) aldosterone antagonists; (iv) implantation of cardioverter-defibrillators; and (v) the application of cardiac resynchronization therapy in patients with QRS prolongation. Each has been shown to reduce mortality in patients with heart failure. As a consequence, the cumulative benefits of these therapies has improved the prognosis in these patients quite substantially.3

The development of a management plan for individual patients with heart failure (as is the case with many conditions) requires an assessment of prognosis. This has been a challenging task in patients with chronic heart failure. A number of risk scores have been established since 2003 to aid physicians in this task.4 These advances, well known to cardiologists, are: (i) blockers of the renin–angiotensin system [angiotensin-converting enzyme (ACE) inhibitors or angiotensin II type I receptor blockers (ARBs)]; (ii) beta-adrenergic blockers; (iii) aldosterone antagonists; (iv) implantation of cardioverter-defibrillators; and (v) the application of cardiac resynchronization therapy in patients with QRS prolongation. Each has been shown to reduce mortality in patients with heart failure. As a consequence, the cumulative benefits of these therapies has improved the prognosis in these patients quite substantially.3

The development of a management plan for individual patients with heart failure (as is the case with many conditions) requires an assessment of prognosis. This has been a challenging task in patients with chronic heart failure. A number of risk scores have been established since 2003 to aid physicians in this task.4 These advances, well known to cardiologists, are: (i) blockers of the renin–angiotensin system [angiotensin-converting enzyme (ACE) inhibitors or angiotensin II type I receptor blockers (ARBs)]; (ii) beta-adrenergic blockers; (iii) aldosterone antagonists; (iv) implantation of cardioverter-defibrillators; and (v) the application of cardiac resynchronization therapy in patients with QRS prolongation. Each has been shown to reduce mortality in patients with heart failure. As a consequence, the cumulative benefits of these therapies has improved the prognosis in these patients quite substantially.3

The development of a management plan for individual patients with heart failure (as is the case with many conditions) requires an assessment of prognosis. This has been a challenging task in patients with chronic heart failure. A number of risk scores have been established since 2003 to aid physicians in this task.4 These advances, well known to cardiologists, are: (i) blockers of the renin–angiotensin system [angiotensin-converting enzyme (ACE) inhibitors or angiotensin II type I receptor blockers (ARBs)]; (ii) beta-adrenergic blockers; (iii) aldosterone antagonists; (iv) implantation of cardioverter-defibrillators; and (v) the application of cardiac resynchronization therapy in patients with QRS prolongation. Each has been shown to reduce mortality in patients with heart failure. As a consequence, the cumulative benefits of these therapies has improved the prognosis in these patients quite substantially.3

The development of a management plan for individual patients with heart failure (as is the case with many conditions) requires an assessment of prognosis. This has been a challenging task in patients with chronic heart failure. A number of risk scores have been established since 2003 to aid physicians in this task.4 These advances, well known to cardiologists, are: (i) blockers of the renin–angiotensin system [angiotensin-converting enzyme (ACE) inhibitors or angiotensin II type I receptor blockers (ARBs)]; (ii) beta-adrenergic blockers; (iii) aldosterone antagonists; (iv) implantation of cardioverter-defibrillators; and (v) the application of cardiac resynchronization therapy in patients with QRS prolongation. Each has been shown to reduce mortality in patients with heart failure. As a consequence, the cumulative benefits of these therapies has improved the prognosis in these patients quite substantially.3
in mortality risk not explained by predictors in our model’. They thought that these differences ‘may be due to geographic variation or unidentified patient selection criteria varying across the cohorts’. Despite the extensive statistical gymnastics, including ‘sophisticated computer-intensive multiple imputation methods’, that were performed, it may require true MAGICC to deal with these problems, especially in the absence of external validation of the risk score (which the authors felt was unnecessary).

The last, and probably the most serious, limitation is that of the five above-mentioned guideline Class IA indications for the treatment of heart failure, only one—one blockade of the renin–angiotensin system—was utilized in two-thirds of the patients with reduced ejection fraction which were entered into the seven largest cohorts. The use of beta-blockers ranged from 0% in the largest trial, the DIG trial, conducted before the widespread use of these agents in prolonging life in patients with chronic heart failure, to 5–55% of patients entered into the other six large cohorts. An aldosterone antagonist was administered in only four of the seven largest cohorts (to between 13% and 50% of the patients) and apparently not at all in the other three cohorts, which were conducted before the routine use of these agents for the treatment of heart failure was advocated. Even in the small minority of patients in whom these three life-prolonging drugs were used, it is not known whether the doses were adequate. Furthermore, there is no mention in Pocock’s paper, or the papers describing the individual cohorts, that any patients received devices—implanted cardioverter-defibrillators or cardiac resynchronization pacemakers—despite the well-established life-prolonging effects of these therapies. Again, these cohorts were studied before these important therapies came into general use.

Fortunately, the care of patients with chronic heart failure and reduced ejection fraction, while still far from ideal, is at last improving. Therefore, the creation of an instrument to estimate risk in future patients presenting with chronic heart failure in a field that is as dynamic as this one is quite challenging. Such a score that is based on observations in patients receiving what would be considered to be inadequate therapy by contemporary standards, and that does not consider a key prognostic measure that is widely used, is analogous to trying to discern the road ahead by peering through a rear view mirror.

Conflict of interest: none declared.

References