



Using ACE inhibitor and beta-blocker therapies in heart failure

Why is this important?

Heart failure is a chronic and complex syndrome with high morbidity and mortality, and is a major health care burden. It is estimated to affect one to two per cent of all Australians and is known to increase sharply with age, affecting around 10–13 per cent of people aged 65 years and older.[1,2] In 2000, an estimated 325,000 Australians were affected by heart failure. A further 214,000 were estimated to have underlying heart failure without overt symptoms.[3]

In elderly people, heart failure is a common reason for seeing their general practitioner and a common cause of hospital admission, with a longer than average length of stay.[1,3] The cost of heart failure to the Australian health care system was estimated to be greater than \$1 billion in the year 2000 and is predicted to continue to rise.[3] This is because of the ageing of the population, the increase in people

suffering from high blood pressure, and improved survival rates for people who experience heart attacks – all of which are known risk factors for the later development of heart failure.[4]

The National Institute of Clinical Studies has chosen heart failure as one of its clinical priority areas because published data suggest there is a gap between evidence and current practice, particularly in the use of angiotensin-converting enzyme (ACE) inhibitor and beta-blocker therapies.

Best available evidence

The term 'heart failure' or 'chronic heart failure' is used here in preference to the term 'congestive heart failure' because symptoms of congestion are not always present.[5]

The definition includes either systolic or diastolic dysfunction of the ventricle(s) or a combination of both.[4] Systolic heart failure is defined as the inability of the heart to pump

normally and is the most common form of heart failure. Diastolic heart failure refers to impairment of filling of the ventricle(s). It should be noted that most of the good quality evidence about heart failure relates to patients with documented systolic ventricular dysfunction.[4]

Numerous clinical practice guidelines on the management of patients with chronic heart failure have been published in recent years, including guidelines for Australia and New Zealand.[4–7] These guidelines recommend that all patients with heart failure due to left ventricular systolic dysfunction should be started on treatment with an ACE inhibitor, regardless of whether the patient's symptoms are mild, moderate or severe, or even when the patient suffers no symptoms at all. The recommendations are based on evidence that ACE inhibitors improve symptoms of heart failure, improve heart function, decrease admissions to hospital and enable patients to live longer.[8,9] ACE

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inhibitor therapy has also been shown to stop patients with left ventricular dysfunction from later developing symptoms of heart failure.[10,11]

Beta-blockers are recommended therapy for patients with heart failure due to left ventricular systolic dysfunction after stabilisation with diuretic and ACE inhibitor therapy, regardless of whether or not symptoms persist.[7] Evidence shows that beta-blocker therapy can improve survival, decrease hospitalisation and improve left ventricular function.[2,12–15]

Current practice

The Cardiac Awareness Survey and Evaluation (CASE) study found that ACE inhibitors were under-prescribed by GPs in Australia. It found that ACE inhibitors were prescribed by GPs in 58 per cent of patients aged 60 years and over with chronic heart failure and in 71 per cent of patients in whom ventricular dysfunction had been objectively documented.[1] Alternatives to

ACE inhibitors, in patients who cannot tolerate this medication or who have contraindications, were prescribed in five per cent of chronic heart failure patients and seven per cent of systolic heart failure patients. Similarly, studies of patients with congestive heart failure in hospital suggest that ACE inhibitors are under-prescribed by hospital medical staff.[16] These findings are consistent with those of similar international studies.[17]

The CASE study also reported under-prescribing of beta-blocker therapy by medical specialists. It found that beta-blockers approved for heart failure use were prescribed for less than six per cent of chronic heart failure patients. At the time of the study, only specialists were permitted to prescribe beta-blockers approved for heart failure use in Australia.

Evidence supporting the benefits of beta-blockers in all severities of heart failure due to left ventricular systolic dysfunction has been

published since the CASE study, and GPs in Australia are now permitted to prescribe two of the beta-blockers approved for heart failure. Studies of GPs indicate that there are a number of barriers to beta-blocker therapy in community settings.[18] Underutilisation of beta-blocker therapy has also been reported in patients hospitalised with heart failure.[16]

Implications

- The prognosis and quality of life for people with heart failure is poor, with only 50 per cent surviving 12 months in severe cases, and 50 per cent surviving five years in asymptomatic cases.[19] Patients diagnosed with heart failure have a three times higher chance of dying within three years than patients diagnosed with breast cancer.[20]
- While there are documented barriers to the effective assessment and management of heart failure patients, some of this morbidity

and mortality could be prevented through the more widespread use of ACE inhibitor and beta-blocker therapies in all patients in whom ventricular dysfunction has been objectively documented.[18]

- Echocardiography is the preferred investigation for the assessment of ventricular function.[4–7] Several Australian and overseas studies have reported that echocardiography is not routinely used by doctors when diagnosing heart failure.[1,17,21] Increased awareness of the appropriate use of echocardiography is needed to improve the assessment of people with heart failure.
- Quality improvement programs are needed that address clinicians' practical concerns about applying research findings to their daily practice. Systems of care that better support the complex needs of people with chronic conditions like heart failure are also required.

References

- 1 Krum H, Tonkin AM, Currie R, Djundjek R, Johnston CI (2001) Chronic heart failure in Australian general practice. The Cardiac Awareness Survey and Evaluation (CASE) Study. *Med J Aust* 174: 439–444
- 2 Doughty RN, Rodgers A, Sharpe N, MacMahon S (1997) Effects of beta-blocker therapy on mortality in patients with heart failure. A systematic overview of randomized controlled trials. *Eur Heart J* 18: 560–565
- 3 Stewart S, McLennon S, Dawson A, Clarke R (2003) Uncovering a hidden epidemic: a study of the current burden of heart failure in Australia. Centre for Innovation in Health, University of South Australia, Adelaide. (Available from www.unisa.edu.au/hsc/events.htm)
- 4 Krum H, National Heart Foundation of Australia and Cardiac Society of Australia & New Zealand Chronic Heart Failure Clinical Practice Guidelines Writing Panel (2001) Guidelines for management of patients with chronic heart failure in Australia. *Med J Aust* 174: 459–466
- 5 Hunt S, Baker D, Chin M, Cinquegrani M, Feldman A, Francis G et al (2001) ACC/AHA guidelines for the evaluation and management of chronic heart failure in the adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1995 Guidelines for the Evaluation and Management of Heart Failure). American College of Cardiology website (Available from http://www.acc.org/clinical/guidelines/failure/hf_index.htm)
- 6 Remme WJ, Swedberg K (2001) Guidelines for the diagnosis and treatment of chronic heart failure. *Eur Heart J* 22:1527–1560
- 7 National Institute for Clinical Excellence (2003) Chronic heart failure: management of chronic heart failure in adults in primary and secondary care. Clinical Guideline 5. (Available from <http://www.nice.org.uk/pdf/CG5NICEguideline.pdf>)
- 8 The SOLVD Investigators (1991) Effect of enalapril on survival in patients with reduced left ventricular ejection fractions and congestive heart failure. *N Engl J Med* 325: 293–302
- 9 The CONSENSUS Trial Study Group (1987) Effects of enalapril on mortality in severe congestive heart failure. Results of the Cooperative North Scandinavian Enalapril Survival Study (CONSENSUS). *N Engl J Med* 316: 1429–1435
- 10 The SOLVD Investigators (1992) Effect of enalapril on mortality and the development of heart failure in asymptomatic patients with reduced left ventricular ejection fractions. *N Engl J Med* 327: 685–691



- 11 Pfeffer MA, Braunwald E, Moye LA, Basta L, Brown EJ Jr, Cuddy TE et al (1992) Effect of captopril on mortality and morbidity in patients with left ventricular dysfunction after myocardial infarction. Results of the survival and ventricular enlargement trial. The SAVE Investigators. *N Engl J Med* 327: 669–677
- 12 CIBIS-II Investigators and Committees (1999) The Cardiac Insufficiency Bisoprolol Study II (CIBIS-II): a randomised trial. *Lancet* 353: 9–13
- 13 MERIT-HF Study Group (1999) Effect of metoprolol CR/XL in chronic heart failure: Metoprolol CR/XL Randomised Intervention Trial in Congestive Heart Failure (MERIT-HF). *Lancet* 353: 2001–2007
- 14 Packer M, Coats AJ, Fowler MB, Katus HA, Krum H, Mohacsi P et al (2001) Effect of carvedilol on survival in severe chronic heart failure. *N Engl J Med* 344: 1651–1658
- 15 The Beta-Blocker Evaluation of Survival Trial Investigators (2001) A trial of the beta-blocker bucindolol in patients with advanced chronic heart failure. *N Engl J Med* 344: 1659–1667
- 16 Scott IA, Denaro CP, Flores JL, Bennett CJ, Hickey AC, Mudge AM et al (2003) Quality of care of patients hospitalized with congestive heart failure. *Intern Med J* 33: 140–151
- 17 Komajda M, Follath F, Swedberg K, Cleland J, Aguilar JC, Cohen-Solal A et al (2003) The EuroHeart Failure Survey programme – a survey on the quality of care among patients with heart failure in Europe. Part 2: treatment. *Eur Heart J* 24: 464–474
- 18 Fuat A, Hungin AP, Murphy JJ (2003) Barriers to accurate diagnosis and effective management of heart failure in primary care: qualitative study. *BMJ* 326: 196
- 19 Davis RC, Hobbs FD, Lip GY (2000) ABC of heart failure. History and epidemiology. *BMJ* 320: 39–42
- 20 Cleland GJ (2000) Improving patient outcomes in heart failure: evidence and barriers. *Heart* 84 (Suppl.): i8–10
- 21 Senes S, Britt H (2001) A general practice view of cardiovascular disease and diabetes in Australia. AIHW cat. no. CVD 17 (Cardiovascular Disease Series no. 18). AIHW, Canberra