# Recent Advances in Heart Failure Treatment

CHEUK-MAN YU

From Department of Medicine & Therapeutics, Prince of Wales Hospital; and Institute of Vascular Medicine, The Chinese University of Hong Kong, Hong Kong

Heart failure (HF) is a disease with high morbidity and mortality. It is also the commonest cause of medical ward admission in developed countries. The incidence of HF has been increasing world-wide in the past two decades. With the current state-of-the-art therapy, 3-year mortality remain >30% in NYHA class III HF, and close to 40% in NYHA class IV HF.

Nowadays HF is classified according to its stages into A to D. Stage A: High risk for developing HF, Stage B: Asymptomatic HF, Stage C: Symptomatic HF, and Stage D: Refractory end-stage HF. Most of the clinical trials targeting on Stage C, though some of them also focused on stage B and D. In the diagnosis, the use of natriuretic peptide has shown to be a both sensitive and in particular specific marker, i.e. good as a rule-out test if BNP or NT-proBNP levels are normal. Medical therapy has not been significantly changed in the last few years, but consolidated on the use of neurohormonal blockers, such as ACE inhibitors, beta-blockers, and consider the third drug by either aldosterone receptor blocker or angiotensin receptor in selected patients. These agents are important as survival benefit and reduction of hospitalization rate are clearly demonstrated.

Despite medical therapy which has been rather steady in the past few years, device therapy for HF has been blooming. Studies observed that at least a quarter of patients with heart failure had evidence of electromechanical delay, commonly in the form of left bundle branch block or intraventricular conduction delay on surface electrocardiogram. This condition results in asynchronous contraction, mitral regurgitation and was associated with a poor prognosis. Cardiac resynchronization therapy (CRT) has a potential role in these patients. Initial non-randomized, and subsequently multicenter clinical trials, consistently found the following benefits after CRT: improvement of symptoms and exercise capacity (6-minute hall walk distance), gain in ejection fraction as well as improvement of quality of life. In addition, we have demonstrated that biventricular pacing increases diastolic filling time, reduces pre-systolic time, reduces mitral regurgitation, and decreases left ventricular volume (reverse remodeling). Reduction of all-cause mortality, heart failure event and sudden cardiac death by CRT has also been confirmed by mutlicentre trials (COMPANISON and CARE-HF studies). Although not every patient response to CRT, the use of echocardiographic imaging has been found highly useful in assessment pre-pacing intraventricular asynchrony and therefore predicting responders of CRT. Another potentially useful device is cardiac contractility modulation (CCM), which is an implantable which boost the intrinsic contractility of the left ventricular by delivering a current to the heart in late systole. Initial results of the device appears promising in Europe, with improvement of symptoms, exercise capacity and ejection fraction. We are currently conducting the only clinical trial outside US and Europe for further evaluation of this new device. Lastly, the use of monitoring device for heart failure is becoming increasingly important in patients receiving HF therapy.

Address for reprints: Prof. Cheuk-Man Yu
Professor of Medicine, Head of Division of Cardiology, Department of Medicine & Therapeutics, Prince of Wales Hospital, Shatin, New Territories, Hong Kong

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