President's Page

Acute Heart Failure: An Old Syndrome Revisited

Dimitrios Th. Kremastinos

2nd University Department of Cardiology, University General Hospital "Attikon", Athens, Greece

Acute heart failure was for many years overshadowed by chronic heart failure, with the result that very few randomised studies of its treatment were carried out and only recently have guidelines been published for its diagnosis and management. In reality, we are talking about a set of different disease entities, whose common clinical expression is an elevated morbidity and mortality, and which are known as acute heart failure (AHF) syndromes. According to the new classification of the European Society of Cardiology, these are: a) acutely decompensated heart failure, which affects about 70% of patients; b) hypertensive AHF; c) acute pulmonary oedema; d) cardiogenic shock; e) high output heart failure; and f) right heart failure.[1,2] Although this classification is based on the underlying pathophysiological mechanisms, the clinical phenotype, and the severity of clinical expression of AHF syndromes, it nevertheless seems to create problems in everyday clinical practice with regard to delivery of the appropriate therapy, since the conditions it comprises have a considerable overlap, while at the same time it is responsible for the great variations among the epidemiological data collected in various registries.[2]

AHF syndromes have an in-hospital mortality that ranges from 4% (ADHERE registry, USA) to 7% (European registries). However, the mortality of these syndromes can reach as high as 27% (in one year), according to Finnish data (Finnish Acute Heart Failure Study, FINN-AKVA), while they are also associated with an extremely high hospital readmission rate (according to EuroHF survey I, around 24% of patients are readmitted at least once within three months for AHF).[3,4] The main parameters that determine the short- and long-term prognosis of patients with AHF are systolic blood pressure; left ventricular ejection fraction; age; markers of renal function (urea, creatinine); serum sodium; plasma levels of brain natriuretic peptide (BNP), or N-terminal pro-BNP, and troponins.[5] Newer biochemical markers, such as cystatin and mid-regional pro-atrial natriuretic peptide (MR-proANP) seem to have additional prognostic value in certain subpopulations of patients with AHF, such as those with renal failure, but more data are needed before they can become established in everyday clinical practice.[6]

A newer, more rational approach to the optimisation of therapy in patients with AHF syndromes is their categorisation into three large subgroups according to their level of systolic blood pressure, which is the best prognostic index in these disorders. The first category is hypertensive AHF, in which symptoms develop acutely, without evidence of chronic pulmonary congestion, and are due mainly to a sudden increase in afterload (vascular failure). These patients usually have a preserved ejection fraction, four times lower mortality than those with low blood pressure, and respond better to treatment with high doses of vasodilators (nitrates, sodium nitroprusside) and low doses of diuretics.[7]

The second large category of patients is normotensives with AHF, who usually have an impaired ejection fraction and chronic congestion, which is worsened by some triggering agent. The management of these patients remains difficult, since despite their initial symptomatic improvement in response to the available treatments, the majority continue to have evidence of congestion. Accepted therapies in this category of patients are diuretics and vasodilators and, if the clinical picture and renal function deteriorate, support with inotropic agents.[1] The calcium sensitiser levosimendan appears superior to standard inotropes in improving these patients' symptoms and in reducing BNP, while it also improves in-hospital mortality when the AHF patient is taking β-blockers (SURVIVE trial).[8]

Finally, the third category of patients is those with low blood pressure and cardiogenic shock, who have the worst prognosis but make up a minority of AHF cases: 2-8% according to studies.[2] These patients should be treated with inotropes and vasoconstrictors, and with mechanical circulation support, and are perhaps the only category of AHF patients who need a haemodynamic examination with right heart catheterisation in order to guide their therapy.[1]

All available clinical evidence shows that the medications used to date for the treatment of AHF do not improve the patients' prognosis. There is a consequent need for the administration of new drugs based on new pathophysiological mechanisms. Vasopressin antagonists are newer diuretics that reduce congestion and may offer an alternative solution for the improvement of symptoms in patients with hyponatraemia and resistance to standard diuretics.[9] Istaroxime is a novel Na/K-ATPase inhibitor and an enhancer of the action of SERCA 2a, which reinforces cardiac contractility with a parallel improvement in left ventricular function.[9] This drug is undergoing phase 2 clinical trials in patients with AHF. Other very promising drugs for AHF are adenosine inhibitors as diuretics, the natriuretic peptide ularitide and relaxin as vasodilators, and myosin activators as intropes.[9] Large, randomised studies that are currently in progress will reveal the short- and long-term efficacy and safety of these drugs in clinical practice. The management of patients with AHF should be carried out by an organised team in accordance with the guidelines, and treatment should be individualised in relation to each patient's underlying clinical condition.[10]

References

1. Nieminen MS, Bohm M, Cowie MR, et al; ESC Committee for Practice Guidelines. Executive summary of the guidelines on the diagnosis and treatment of acute heart failure: the Task Force on Acute Heart Failure of the European Society of Cardiology. Eur Heart J. 2005; 26: 384-416.
2. Gheorghiade M, Zannad F, Sopko G, et al; for the International Working Group on Acute Heart Failure Syndromes. Acute heart failure syndromes: current state and framework for future research. Circulation. 2005; 112: 3958-3968.
3. Fonarow GC, Corday E; ADHERE Scientific Advisory Committee. Overview of acutely decompensated congestive heart failure (ADHF): a report from the ADHERE registry. Heart Fail Rev. 2004; 9: 179-185.
4. Nieminen Burtsaert D, Dickstein K, et al. EuroHeart Failure Survey II (EHFS II): a survey on hospitalized acute heart failure patients: description of population. Eur Heart J. 2006; 27: 2725-2736.
5. Isaac D. Biomarkers in heart failure management. Cur Opin Cardiol. 2008; 23: 127-133.
6. Von Haehling S, Jankowska EA, Morgenthaler NG, et al. Comparison of midregional pro-atrial natriuretic peptide with N-teminal pro B-type natriuretic peptide in predicting survival in patients with heat failure. J Am Coll Cardiol. 2007; 50: 1973-1980.
7. Cotter G, Metzkor E, Kaluski E, et al. Randomised trial of high-dose isosorbide dinitrate plus low-dosefurosemide versus high-dose furosemide plus low-dose isosorbide dinitrate in severe pulmonary oedema. Lancet. 1998; 351: 389-393.
8. Parissis J, Filippatos G, Farmakis D, Adamopoulos S, Paraskevaidis I, Kremastinos D. Levosimendan for the treatment of acute heart failure syndromes. Exp Opin Pharmacother. 2005; 6: 2741-2751.
9. Shin DD, Brandimarte F, De Luca L, et al. Review of current and investigational pharmacologic agents for acute heart failure syndromes. Am J Cardiol. 2007; 99: 4A-23A.
10. Kremastinos D, Parissis J, Filippatos G. In: Textbook of Acute Heart Failure Syndromes. London: Springer Verlag; 2008; p. 297-305.