SCIENTIFIC EDITORIAL

Echocardiographic examination: A major role in the management of heart failure

Échocardiographie : rôle capital dans la prise en charge de l’insuffisance cardiaque

Damien Logeart

Département de cardiologie, hôpital Lariboisière, 2, rue Ambroise-Paré, 75010 Paris, France

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Echocardiographic examination is the main imaging tool for the comprehensive assessment of heart failure, with respect to diagnosis, stratification, and follow-up. Hospitalization for heart failure tends to be associated with worsened prognosis [1]. The pathology is identified in around one-third of hospitalizations for acute heart failure, leading to initial assessment of the underlying cardiomyopathy, usually performed with an echocardiogram. This examination forms part of the diagnosis, looking for systolic and/or diastolic left ventricular dysfunction, evidence of ischaemic disease, hypertrophic cardiomyopathy, valvular disease, pulmonary hypertension, right ventricular dysfunction, and pericardial disease. Identification of any of these abnormalities can be highly clinically relevant, although specific concerns regarding echographic-based diagnosis of heart failure with preserved ejection fraction have been underlined recently [2].

In patients with chronic heart failure, decompensated heart failure may be due to a worsening of the underlying cardiomyopathy or to another factor such as deterioration of an associated valvular disease, presence of atrioventricular or intraventricular asynchronism, intraventricular thrombosis, or significant pulmonary hypertension. Serial echographic examinations can help to guide treatment during hospitalization in difficult cases [3], mainly by monitoring cardiac output and filling pressures [4]. In most intensive care units, echocardiography is now more frequently used than pulmonary artery catheters. Moreover, Doppler analysis-derived filling pressures can predict early outcome after discharge. Although brain natriuretic peptide testing is very useful to rule out the diagnosis on admission and to stratify patient severity [1], this exam cannot replace echocardiography. Therefore, echocardiography should be performed during any hospitalization for heart failure.
Guidelines on the management of acute heart failure contain little information on the use of echocardiography. In recent European guidelines, echocardiographic examination was associated with a class I recommendation, but with only a C level of evidence [1]. Although it would be highly informative to demonstrate that daily use of echocardiography would favourably alter the outcome of heart failure patients, ethical issues will not permit prospective and randomized trials to prove this is the case. Thus, evidence can be obtained only from observational studies.

In this issue of the journal, Tribouilloy et al. report on one of the very few studies that analyse the impact of echographic examination on outcome. This multicentre survey recruited 799 consecutive patients hospitalized for new-onset heart failure in cardiology, internal medicine and geriatric units [5,6]. The authors show that echocardiographic examination during the index hospitalization is associated with better outcome after discharge compared to that of patients discharged without echocardiography performed. It is not surprising to observe that echocardiography was less likely to be used in the elderly, in those suffering from other comorbidities, or in patients admitted in geriatric units. To reduce such obvious biases, the authors performed multivariable analyses and used propensity scores to match patients from the two groups, with or without echocardiography. After adjustment, there was still a strong difference between the groups: the rates of total mortality and cardiovascular mortality at 3 years were, respectively, 40 and 50% lower if echocardiography was performed during the index hospitalization. However, it is also likely that some patients did not undergo an echocardiographic exam because of a high rate of comorbidities, lower socioeconomic status, or psychological disabilities, when these characteristics are associated with the worst prognosis but are poorly measurable in statistical analysis. Finally, the results of Tribouilloy et al. are very similar to those from the Mayo Clinic study, which was performed in 1991 in outpatients with a recent diagnosis of heart failure [7]: the adjusted rate of survival was 40% higher in patients who underwent echocardiography compared with those who did not.

These results raise the question of the specific links between echocardiography and outcome. Which parameters are actually considered by physicians to adjust their therapeutic strategy: left ventricular ejection fraction, dilation, filling parameters, pulmonary artery pressure? Is there any increase in prescription of angiotensin-converting enzyme inhibitors and beta-blockers if the echocardiography reports a low ejection fraction, as suggested by Tribouilloy et al.? Are diuretics adjusted to the level of Doppler-derived filling pressures? Is the diagnosis of specific aetiologies such as valvular or ischaemic disease more common?

If echocardiography is so important in patients with heart failure, how can we improve its integration in our daily clinical practice? Echocardiography was performed in 81% of cases in the survey by Tribouilloy et al. In the EuroHeartFailure survey, conducted in 2000–2001 [8], echo was performed in only 34% of the patients admitted for heart failure (53% in France). The more recent EuroHeart Failure Survey II, performed in 2004–2005, reported a higher echocardiography rate of 85% [9]; but such surveys, in which participation by cardiologists is voluntary, are unlikely to be representative of real-world practice. In the large, American Acute Decompensated Heart Failure National Registry (ADHERE) registry, echocardiography was performed in 80% of patients admitted for heart failure [10]. In a similar and recent registry from the United Kingdom, the rate of echocardiographic examination fell to 56% [11]. How can we explain such differences? Are they due to differing access to cardiac units and/or echolab, or to the awareness and/or interest of practitioners for heart failure (and consequently adherence to practice guidelines)? In the study by Tribouilloy et al., echocardiography was performed in 90% of patients in cardiac units but in only 36% of patients in geriatric units. Such results can be compared to those from other observational studies, which concluded that patients’ survival rate was higher when they were treated by cardiologists versus noncardiologists, mainly because of better adherence to evidence-based guidelines [12–14]. To improve access to echolabs and to increase the number of cardiologist visits in noncardiac units, specific strategies of care for each medical institution have to be developed. Accurate and early identification of patients with heart failure is an important and difficult issue that can be solved partially by brain natriuretic peptide testing [15]. Then, complementary echocardiography combined with a visit by a cardiologist should complete the strategy. In a randomized trial, Heinderich et al. demonstrated that clinical reminders attached to echocardiography reports increased the use of beta-blockers (74% versus 66%) for patients with reduced left ventricular ejection fraction [16]. Echocardiography reports should be as comprehensive as possible. For example, diagnosis of diastolic heart failure, which is frequent in geriatric units, can be challenging without a comprehensive echocardiography report [2]. The delay between admission and performing the echocardiography is also an issue. An echocardiogram performed early is clearly more efficient for therapeutic adjustment and for reducing length of hospital stay.

Acute heart failure — de novo or decompensation of chronic heart failure — is not a common event that requires only intravenous diuretics before discharge. As in acute coronary syndromes, acute heart failure requires accurate assessment and an ‘active’ therapeutic strategy during hospitalization as well as after discharge. This involves performing an echocardiogram as soon as possible after admission, and providing an understandable and comprehensive report for use by noncardiologist physicians.

References


