Evaluation of heart failure management in a Military Hospital

Évaluation de la prise en charge de l’insuffisance cardiaque dans un Hôpital d’Instruction des Armées

O. Guiraudet, G. Lambert de Crémeur, L. Bonnevie, P. Héno, C. Pelletier, R. Fraboulet, P. Schiano, A.-C. Martin, M.-C. Chenilleau, D. Delarbre, X. Chanudet

Département de cardiologie, Hôpital d’Instruction des Armées Bégin, Saint-Mandé.
Département d’anesthésie et réanimation, Hôpital d’Instruction des Armées Bégin, Saint-Mandé.
Département des urgences, Hôpital d’Instruction des Armées Bégin, Saint-Mandé.
Département de cardiologie, Hôpital d’Instruction des Armées du Val-de-Grâce, Paris.

Summary
Purpose. — Evaluate heart failure management in a Military Hospital in 2005.
Methods. — Retrospective audit of 46 case records of patients hospitalised with heart failure within the framework of an accreditation procedure.
Results. — The left ventricular ejection fraction was evaluated in 85% of cases during the reference hospital stay. Systolic heart failure was detected in 63% of cases. At least one NT-proBNP assay was performed for each patient. A global assessment was systematically performed, except for the mini mental state examination in patients aged over 75 years who represented 80% of patients. Initial therapeutic education was provided for 50% of systolic heart failure patients. Prescription rates in systolic heart failure were 76% for angiotensin-converting enzyme inhibitors, 7% for angiotensin receptor antagonists; 84% for at least one medicinal product in the above 2 classes; 68% for beta-blockers and 32% for spironolactone. A hospital discharge report was available for 93% of the patients. Elective re-admissions to hospital for uptitration of treatment concerned 10% of systolic heart failure patients. Emergency hospital re-admissions after a cardiovascular event (usually decompensation), concerned 35% of patients, after an average duration of one year of follow-up. These latter re-admissions, often repeated, led to 4% of additional hospital deaths. The initial hospital mortality rate was 13%.
Conclusion. — Therapeutic patient education is under development. Medication may still be optimised, both qualitatively and quantitatively. Surveillance is planned with a yearly audit.

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KEYWORDS
Heart failure; Therapeutic management; Health care quality.
Résumé
Méthode. — Audit rétrospectif réalisé dans le cadre d’une procédure d’accréditation de 46 dossiers de patients hospitalisés pour insuffisance cardiaque.
Résultats. — La fraction d’éjection ventriculaire gauche a été évaluée dans 85 % des cas lors de l’hospitalisation de référence. Il s’agissait d’une insuffisance cardiaque systolique dans 63 % des cas. Chaque patient a bénéficié d’au moins un dosage du NT-pro BNP. L’évaluation globale a été systématique, sauf pour la réalisation du mini mental state examination chez les plus de 75 ans, représentant 80 % des patients. Une éducation thérapeutique initiale a été réalisée pour 50 % des insuffisants cardiaques. Le taux de prescription dans l’insuffisance cardiaque systolique des inhibiteurs de l’enzyme de conversion était de 76 %, des antagonistes des récepteurs de l’angiotensine II : 7 %, d’au moins un médicament des 2 classes précédentes : 84 %, de béta-bloquants : 68 %, de spironolactone : 32 %. Un compte rendu d’hospitalisation était disponible pour 93 % des patients. Les rehospitalisations programmées pour majoration progressive du traitement ont concerné 10 % des insuffisants cardiaques. Les rehospitalisations en urgence à l’hôpital motivées par un événement cardiovasculaire (le plus souvent une décompensation), ont intéressé 35 % des malades, pour une durée moyenne de suivi de un an. Ces dernières, souvent répétées, ont été à l’origine de 4 % de décès supplémentaires dans l’institution. Le taux de mortalité hospitalière initiale était de 13 %.
Conclusion. — L’éducation thérapeutique est en cours de développement. Il reste une marge pour l’optimisation du traitement médicamenteux, à la fois qualitative et quantitative. Une surveillance par audit annuel est prévue.

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Introduction
Heart failure constitutes a major public health problem, because of its prevalence, increasing with age and the ageing of the population as well as because of difficulties in diagnosis particularly in elderly subjects, its accompanying morbidity and mortality and the cost for society [1-7]. We were interested in assessing heart failure management at the Bégin Military Hospital (MH) in 2005 [8, 9] within the scope of an accreditation procedure. Like all military hospitals, the hospital has a public service role. Heart failure is the first reason for admission to the cardiology department, either in cardiology intensive care (75/355: 21% of admissions) or in the conventional hospitalisation sector (165/937: 18%).

Methods
Design
46 medical records from patients admitted to the cardiology department during the first six-month period of 2005 were reviewed retrospectively after random selection (using alphabetical lists of names obtained by using the heart failure codes of the 10th revision of the international classification of diseases: I50.0, I50.1, I50.9). The first six months of the year were chosen in order to have a longer follow-up (mean follow-up duration of 12 months [9 to 15 months]). A single medical record was incomplete (i.e. 5%), as it had a missing Emergency Department (ED) admission record.

Data collected
A data collection grid was prepared according to the joint national guidelines of the French Cardiology Society and the French Society of Geriatrics and Gerontology published in 2004, concerning the diagnosis and management of heart failure in elderly subjects [3] (appendix). The variables collected concerned the hospital department to which the patient was first admitted as well as clinical, paraclinical, social, therapeutic as well follow-up data.

Analysis
A descriptive analysis of collected variables was performed.

Results
Admissions
46% of patients were admitted via the ED and 35% directly to the cardiology department.
40% of transfers to the cardiology department were carried out on the day of admission and 20% during the following 2 days.

Evaluation of morbidity
Positive and differential diagnosis
A clinical examination (evaluation of dyspnoea, detection of asthenia, peripheral oedema, alveolar and/or bronchial ronchi, signs of right heart failure, tachycardia and an S3 ventricular gallop, advanced heart valve disease) and conventional paraclinical investigations (ECG, chest X-ray and measurement of SpO2 or arterial gazometry in ambient air) were systematically performed.

Transthoracic echocardiography or equivalent (evaluation of left ventricular ejection fraction [LVEF]) was
conducted during the reference hospital stay in 85% of patients (77% of cases during the stay in the cardiology department).

NT-proBNP was assayed at least once in all patients (this assay was systematically performed in the ED for patients admitted via this department).

Diagnosis of the type of LV dysfunction
Systolic for 63% of patients (threshold LVEF value lower than 50%), otherwise with preserved LV systolic function or rarely not assessed (no known systolic dysfunction or not tested in 4% of the cases).

Aetiology and precipitating factor
These were systematically sought, at least from the clinical and conventional paraclinical findings. There was no individually identifiable precipitating factor in 40% of cases, particularly in advanced dilated cardiomyopathy, except that acute coronary syndrome was more frequently observed (17%), followed by episodes of infection (15%), poor adherence or drug misadventures (8%), atrial fibrillation (8%), hypertensive flare-ups (8%) and anemia (8%). Coronary disease (37%) was the main etiology, followed by high blood pressure (24%), valve disease (16%), atrial fibrillation (13%) and these were often present concomitantly in elderly subjects.

Diagnosis of co-morbidities
The overall evaluation (of the underlying diathesis) was also systematically performed, except for the conduct of the mini mental state examination (MMSE) in patients aged over 75 years (80% of our patients), which was performed in 5%. Autonomy was assessed in a standardised manner using a questionnaire concerning food behaviour, drug compliance, washing, toileting, transfers, assistance from care-givers or in some cases a home aid and detection of incontinence. The nutritional status was evaluated from dietary habits and overall from body weight, analysis of motricity, tests for dependence, trophic disorders (pressure sores), and in some cases assay of serum albumin concentrations.

Social evaluation
Social data was collected on admission. A social aid file was opened if a welfare officer intervened.

Treatment

Institution of treatment without delay:
in 96% of the cases, with 4% delay due to diagnostic difficulties.

Dietary and lifestyle measures
(education, rehabilitation)
Therapeutic patient education (TPE) was provided during the hospital stay for approximately 50% of systolic heart failure patients, with interactive information given by a nurse. This was systematically evaluated using a questionnaire and the patient was then given a patient diary. This gave information about warning signs, factors of decompensation, dietary-lifestyle measures and medication, self-monitoring and laboratory monitoring procedures. Discharge body weight as well as blood electrolytes, serum creatinine and NT-proBNP levels were also recorded in the diary. TPE was repeated where necessary (if it had been poorly formulated). These TPE sessions were noted in the patient’s medical record. Education was sometimes restricted by the elderly age (95 years and more) or dementia syndromes (7% of heart failure patients). The family was then used as a healthcare partner. Rehabilitation was rarely used and concerned 7% of systolic heart failure patients.

Psychological support
This was sometimes provided by volunteers from palliative care associations.

Medication
Discharge medication included angiotensin-converting enzyme inhibitors (ACEi) for 82% of patients (76% for systolic heart failure patients), angiotensin receptor antagonists (ARA) for 7% (8% for systolic heart failure patients), and drugs in one of these two classes for 90% (84% of systolic heart failure patients). Beta-blockers were prescribed in 67% of patients and 68% of the systolic heart failure patients (who used validated products).

Spironolactone was prescribed in 20% of patients and 32% of systolic heart failure patients.

Patient end-of-life care was provided in accordance with the department’s protocol.

Surveillance and liaison

Hospital discharge report
This was available for 93% of patients.

Hospital readmissions
Elective readmissions to hospital for uptitration of treatment concerned 10% of the systolic heart failure patients.

Emergency hospital readmissions following a cardiovascular event, concerned 35% of patients and were often repeated (57%), in most cases secondary to decompensation (71%) with a further 4% of additional deaths at the Bégin MH (for an average follow-up duration of one year).

Mortality
The initial hospital mortality rate was 13%.

Discussion
This was a study on a small patient population, analysed retrospectively within the framework of an evaluation of professional practices, conducted at the time of the second accreditation visit. This population had the usual characteristics of heart failure patients: very elderly subjects including approximately half with systolic heart failure and a prevalence of ischemic heart disease. Precipitating factors were conventional, though quite often these were not individually identifiable and then showed the advanced stage of the cardiomyopathy [1-7]. The initial and total one-year hospital mortality were 13% and 17% respectively in our hospital, with 35% of emergency hospital readmissions. These
data agree with what is known about acute heart failure [7]. The SENIORS study (conducted between 2000 and 2002) showed for a younger population than ours of heart failure patients (systolic or with preserved LVEF) with an average age of 75 years, an annual mortality rate in the nebivolol arm of approximately 4% with 14% of hospital readmissions for cardiovascular events [10]. In the MERIT-HF sub-group of elderly subjects (age over 65 years, average age 72 years, with systolic heart failure, performed at the end of the 1990s), after one year of follow-up the cardiovascular death rate was 8% and the hospital readmission rate for cardiovascular events, was 27% in the metoprolol arm, including approximately half because of cardiac decompensation. In a small sub-group (490 patients) aged over 74 years in MERIT-HF, the annual death rate was 10%, with 23% of hospital readmissions for decompensation [11]. Lastly, the Euroheart Failure Survey registry, in 2001, for patients with an average age of 76 years, gave an initial hospital death rate of 6.9%; cumulative mortality at 3 months was 13.5% and the hospital readmission rate was 24% (including approximately 1/3 for heart failure) [12]. A Euroheart Failure Survey sub-study showed a mortality rate of 68% in patients aged over 75 years (vs 31% for younger patients) after a follow-up of almost 4 years [13].

The determination of LVEF is an indicator of the quality of the clinical evaluation [14]. Moreover the investigation of professional practices has a higher sensitivity for analyzing the quality of a healthcare structure than the evaluation of disease outcomes inside the same hospital [15]. In our study, LVEF was evaluated in 85% of patients during the audited hospital stay. Again for the Euroheart Failure Survey registry, the evaluation of LVEF was conducted in 63% of patients in Europe and 91% in France [12]. A cross-sectional study evaluating the quality of management of heart failure in 1999 in 3 Swiss university hospital centers demonstrated, in addition to large centers disparities, an evaluation of LVEF in 68% of patients [16]. Another retrospective study on a cohort of veteran outpatients in the USA, performed between 2000 and 2002, evaluating racial differences in the quality of care and prognosis showed that LVEF was determined in 85% [17]. An evaluation of the quality of healthcare and its outcome carried out in more than 3000 accredited US hospitals, from 2002 to 2004, showed, for heart failure, that LVEF was evaluated on average in 85% of patients (in less than 80% for the low performing centers, between 80 and 90% for average performing centers and more than 90% in the high performing centers) [14]. A single-center retrospective study on the quality of care dispensed to Afro-American patients admitted for heart failure in 2005 showed that LVEF was evaluated in 96% of patients [18]. At least one assay for NT-proBNP, initially used for diagnosis (particularly in the ED), was carried out in all patients [19].

The recommendation concerning the MMSE in patients aged over 75 years was not generally followed due to lack of time but was evaluated during TPE. Systematic realization of this examination is justified both by the fact that it is impossible to screen for incipient impairment during the usual clinical examination and by the insufficient reliability of data collected during the interview in such a context [3]. The 5-word test provides another tool to diagnose impairment before PTE as this screening test was designed to be easily and widely used and has a good diagnostic value (sensitivity of 63% and specificity of 91%) [20]. When this therapeutic patient education cannot be in an appropriate way dispensed, the close contacts are trained instead of the patient.

For discharge medication, the Euroheart Failure Survey program register showed for all types of heart failure put together, prescription rates of 62% for ACEi (80% in systolic heart failure), 4.5% for ARB (6% in systolic heart failure), 37% for beta-blockers (49% in systolic heart failure) and 20.5% for spironolactone (21%). For the subgroup of patients aged over 70 years, ACEi were prescribed in 58% of heart failure patients, and beta-blockers in 30% [12]. The Swiss study showed prescription rates of 86 % for ACEi and 21 % for beta-blockers [16]. The study in veterans showed prescription rates of 80% for ACEi, 8% for ARB and 63% for beta-blockers, in systolic heart failure patients [17]. The evaluation of the quality of care in US hospitals showed mean prescription rates of 75% for ACEi (up to 70% in the low performing centers, between 71 and 80% in average performing centers and more than 80% in the high performing centers) [14]. The study concerning quality of care provided to Afro-Americans patients admitted for heart failure in 2005 gave prescription rates of 76% for ACEi, 15 % for beta-blockers, 10% for spironolactone and these rates were 89%, 24% and 15% respectively for systolic heart failure patients [18]. A cross-sectional survey carried out in 2005 in the French Cardiology ICU concerning the management of post-MI heart failure and systolic LV dysfunction showed prescription rates of 73% for ACEi and 66% for beta-blockers [22]. These prescriptions are particularly meaningful [23]. Mortality was multiplied by 8 in the event of non-specialized management and 6 in the absence of a neurohumoral blockade [13]. The usual underdosing with ACEi and beta-blockers was not evaluated [24].

Concerning TPE, the North-American quality study showed that information about recommended post-discharge management was given to approximately 30% of patients in the low performing centers, close to 50% for average performing centers and more than 70% in the high performing centers [14]. The study of Afro-Americans patients admitted for heart failure in 2005 showed that 50% received advice about the importance of good adherence to drug treatment and a low-sodium diet and 9% on daily weighing [18]. The importance of therapeutic patient education, including in terms of a reduction in morbidity and mortality, is currently well documented, placing it at the same level as well-conducted medication [25-30]. Because of the impact of education and the unfavourable short-term outcome of heart failure, PTE is still relevant in subjects aged over 75 years [25, 26]. Moreover, it is ethically difficult to justify not providing information to patients about the most essential part of their treatment, just because of their advanced age.

The evaluation of professional practices legitimates audit as a tool for monitoring the performance of a healthcare structure [31, 32]. In particular, it has a positive impact on the quality of care, which is the main reason for the accreditation procedure [33, 34]. The rate of improvements is inversely correlated to the level of performance of the center [14]. It is mainly based on feedback-information and emulation [33, 34]. In our center, the desire for progress has made us more aware of the need to develop therapeutic patient education and improve team work in order to optimize global patient management.
## Appendix. Heart failure management evaluation grid

<table>
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<th>Department of admission:</th>
<th>Transferred to:</th>
<th>Death during stay:</th>
<th>Name of evaluator:</th>
<th>Title:</th>
<th>Patient identification: first 3 letters or label:</th>
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<td>Response to treatment</td>
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### POSITIVE DIAGNOSIS

### CONVENTIONAL PARACLINICAL INVESTIGATIONS

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<td>Precipitating factor</td>
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Conclusion

This evaluation shows that there is a possible margin for progression and invites us to continue this action by making therapeutic patient education a priority. The implementation of a healthcare guide in the department, the provision of an educational assessment as well as the creation of 2 weekly shifts for auxiliary medical staff dedicated to education is a step in this direction. Other approaches include forward optimization of medication, in particular by a wider use of beta-blockers which have been validated in elderly subjects and are very well tolerated and the development of treatment uptitration. Copies of medical reports are systematically sent to patients to increase their involvement. Education and surveillance are complementary. It is essential to integrate primary care doctors in the healthcare network. A software application dedicated to heart failure patients is under evaluation. An annual audit will be conducted to evaluate this progress.

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References

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