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Original Paper

Clinical Characteristics and Outcomes of Patients with Heart Failure Hospitalized in the Clinical Emergency Hospital of Bucharest

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REZUMAT

Caracteristicile clinice și evoluția pacienților cu insuficiență cardiacă internați în Spitalul Clinic de Urgență București

Obiectivul studiului a fost de a investiga caracteristicile clinice, management-ul și evoluția pacienților cu insuficiență cardiacă cronică internați consecutiv în Clinica de Medicină Internă a Spitalului Clinic de Urgență București, pe o perioadă de 8 luni (1 ianuarie 2012 - 31 august 2012).
Metoda: Studiul a inclus 436 pacienți. Au fost analizate datele din baza de date a spitalului. La fiecare pacient s-a efectuat examen obiectiv, EKG, teste de laborator, ecocardiografie 2-D și alte teste imagistice.
Rezultate: Vârsta medie a pacienților a fost de 59.2 ±17.4 ani. Distribuția în funcție de sex: 233 (53,4%) bărbați și 203 (46,6%) femei. Hipertensiunea arterială a reprezentat cauza principală a insuficienței cardiace (45.92%), urmată de boala cardiacă ischemică (38.22%), diabetul zaharat (16.51%), bolile valvulare și alte cardiomiopatii. 46% din pacienți au fost în ritm sinusal și 44.50% în fibrilație atrială. Principalele comorbidități au fost: 31.6% dislipidemie, 22% boală cronică de rinichi și 5.3% boală arterială periferică; 11.7% din pacienți au avut hipertensiune pulmonară. Durata medie de spitalizare a fost de 7 zile. Mortalitatea intraspitalicească a fost de 5.9%. Rata de re-internare la 90 zile, datorită insuficienței cardiace, a fost de 6.7%. Diureticele parenterale au fost administrate la 69.21% din pacienți; 82.55% din pacienți au primit inhibitori ai enzimei de conversie sau blocante ale receptorilor de angiotensină, 62.11% beta-blocante, 39.24% antagoniști de aldosteron și 29.36% inotrope în timpul spitalizării.
Concluzii: Cea mai frecventă cauză a insuficienței cardiace în grupul de studiu a fost hipertensiunea arterială, urmată de boala coronariană. Aproape 2/3 din pacienți au primit diuretice parenterale pentru ameliorarea simptomelor; majoritatea au primit inhibitori ai enzimei de conversie și blocante ale receptorilor de aldosteron. Pentru prevenția trombembolismului la pacienții cu fibrilație atrială, acenocumarol-ul a fost medicamentul preferat.
Cuvinte cheie: insuficiență cardiacă, comorbidități, rata internărilor

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ABSTRACT

The aim of the study was to investigate clinical characteristics, management and outcomes of patients with chronic heart failure consecutively admitted in the Internal Medicine Clinic of the Clinical Emergency Hospital of Bucharest, during a period of 8 months (1st of January - August 31, 2012).

Methods: The study included 436 patients. We analyzed data from the hospital record database. In each patient clinical examination, ECG, laboratory tests, 2-D echocardiography and other imaging tests were performed.

Results: The mean age of the patients was 59.2 ±17.4 years. The distribution by sex: 233 (53,4%) men and 203 (46,6%) women. Arterial hypertension was the leading cause of heart failure (45.92%), followed by ischemic heart disease (38.22%), diabetes mellitus (16.51%), valvular diseases and other cardiomyopathies. 46% of patients were in sinus rhythm and 44.50% in atrial fibrillation. The main comorbidities were: 31.6% dyslipidemia, 22% chronic kidney disease and 5.3% peripheral artery disease; 11.7% of the patients had pulmonary hypertension. The median length of hospital stay was 7 days. In hospital mortality was 5.9%. Post-discharge 90-day rehospitalization due to heart failure was 6.7%. Parenteral diuretics were administered in 69.21% of the patients; 82.55% of patients received angiotensin-converting enzyme (ACE) inhibitors or angiotensin-receptor blockers (ARBs), 62.11% beta-blockers, 39.24% aldosteron antagonists and 29.36% inotropics during hospitalization.

Conclusions: The most common etiology of heart failure in the group was arterial hypertension, followed by coronary artery disease. Almost 2/3 of the patients received parenteral diuretics for symptoms relief; the majority received ACE inhibitors or ARBs. For the prevention of thromboembolism in patients with atrial fibrillation, acenocumarol was the preferred treatment.

Key words: heart failure, comorbidities, hospitalization rate

INTRODUCTION

Heart failure is a complex clinical syndrome that can be determined by any structural or functional cardiac disease that impairs the ability of the left ventricle to fill or eject blood. In developed countries, heart failure is a main cause of morbidity and mortality for adults older than 65 years, the risk of developing heart failure being increased with advancing age. Heart failure hospitalizations are associated with substantial morbidity and mortality. Understanding factors that influence clinical outcomes of patients hospitalized for heart failure, particularly the modifiable ones, may be useful for identifying strategies to improve the outcomes of these patients.

The aim of the study was to investigate the clinical characteristics, management and outcomes of patients with chronic heart failure consecutively admitted in the Internal Medicine Clinic of the Clinical Emergency Hospital of Bucharest, during a period of 8 months (1st of January - August 31, 2012).

METHODS

We performed a retrospective study on 436 patients. For every case we collected information about demographics, medical history, current medication. In each patient clinical examination, thoracic X-Ray, ECG, laboratory tests, 2-D echocardiography were performed and in special cases other imaging tests were added. We analyzed data from the hospital record database.

RESULTS

The mean age of the patients was 59.2 ±17.4 years. 233 patients (53,4%) were men and 203 (46,6%) were women.The distribution by NYHA class in our study group was: no patient with NYHA class I, 149 (34,2%) patients with class II, 142 (32,5 %) patients with class III, 119 (27,3%) patients with class IV; 26 (6%) patients didn't have the NYHA class recordered (**Fig. 1**). The mean ejection fraction in patients with symptoms of NYHA class II was 46±5 %, in those with class III was 35±3% and 17±3% in patients with class IV.

Arterial hypertension was the leading cause of heart failure (45.92%), followed by ischemic heart disease (38.22%), diabetes mellitus (16.51%), valvular diseases and other cardiomyopathies (**Fig. 2**).

46% of patients were in sinus rhythm, 44.50% in atrial fibrillation, 2% had supraventricular tachycardia and 3% ventricular tachycardia (**Fig. 3**). The main comorbidities in the group of study-4

were: 31.6% dyslipidemia, 22% chronic kidney disease and 5.3% peripheral artery disease; 11.7% of the patients had pulmonary hypertension (**Fig. 4**). 96% of patients with chronic heart failure and atrial fibrillation were anticoagulated. For the prevention of thrombo-embolism in patients with atrial fibrillation, acenocumarol was the preferred treatment.

The median length of hospital stay was 7 days. 26 patients died during hospitalization (5.96% in-hospital mortality rate). Post-discharge 30-day rehospitalization rate due to heart failure was 11.2%, whereas 90-day rehospitalization was 6.7%.

Parenteral diuretics (furosemide) were administered during hospitalization in the majority of cases (69.21% of the patients) for congestion relief; 82.55% of patients received angiotensin-converting enzyme (ACE) inhibitors or angiotensin-receptor blockers (ARBs), 62.11% received beta-blockers, 39.24% aldosteron antagonists, and 29.36% inotropics (97 patients received digoxin and 31 patients dobutamine or dopamine). Only 4.75% of patients received ivabradine (**Fig. 5**).

DISCUSSIONS

In the 1970s, hypertension and coronary artery

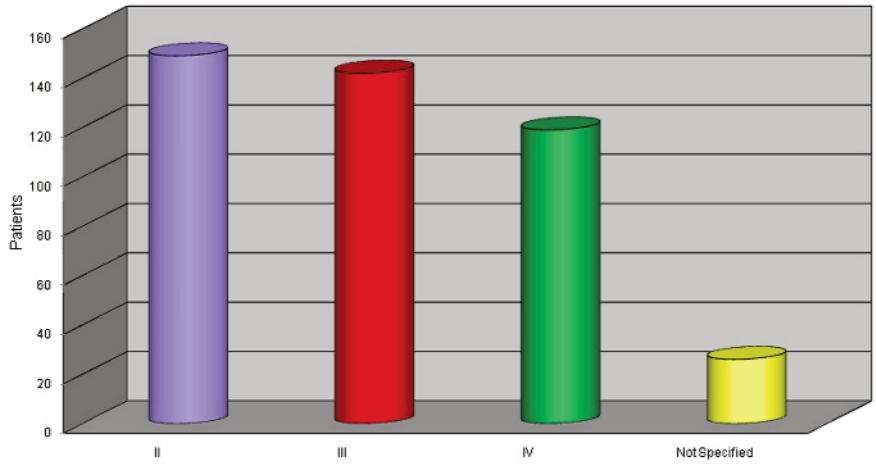

Figure 1. Distribution by NYHA class of our study group

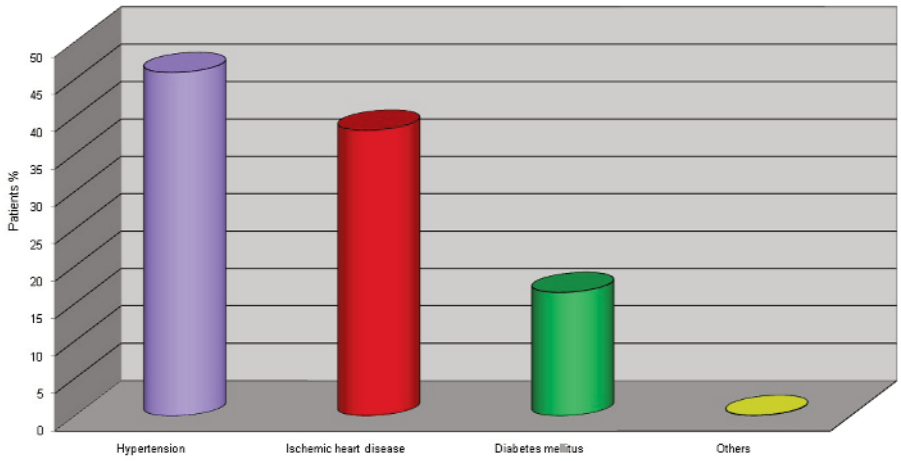

Figure 2. Distribution by etiology of heart failure

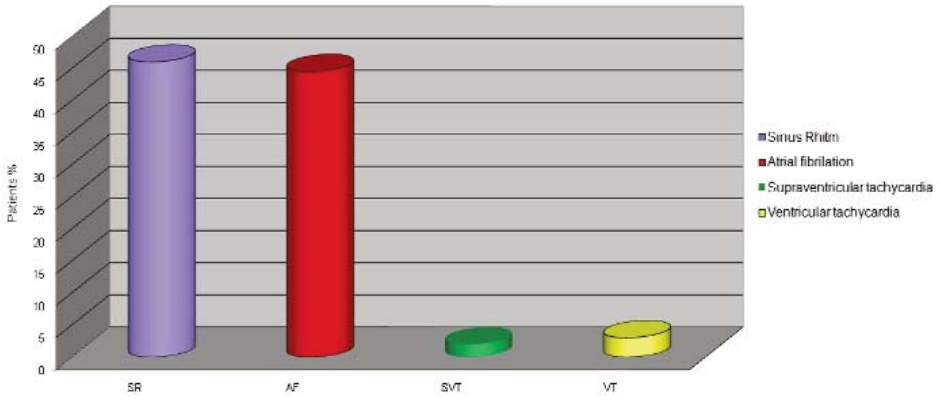

Figure 3. Distribution of heart rhythms in the group of study

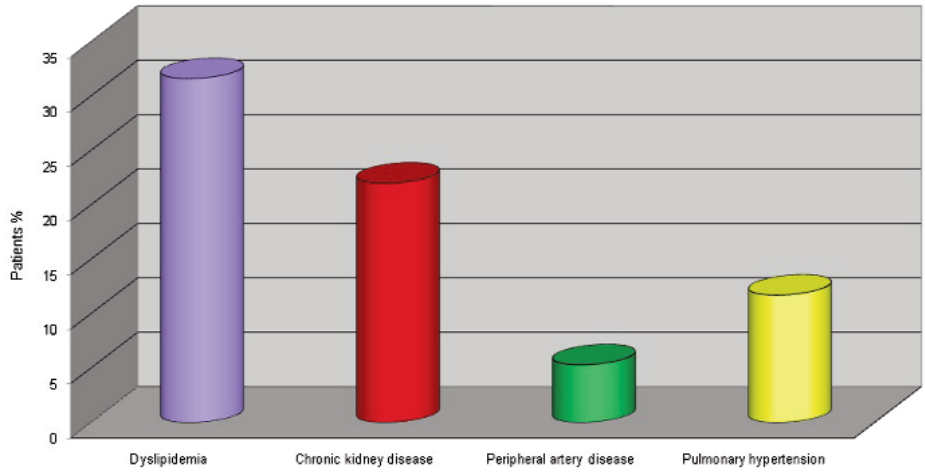

Figure 4. Distribution of comorbidities

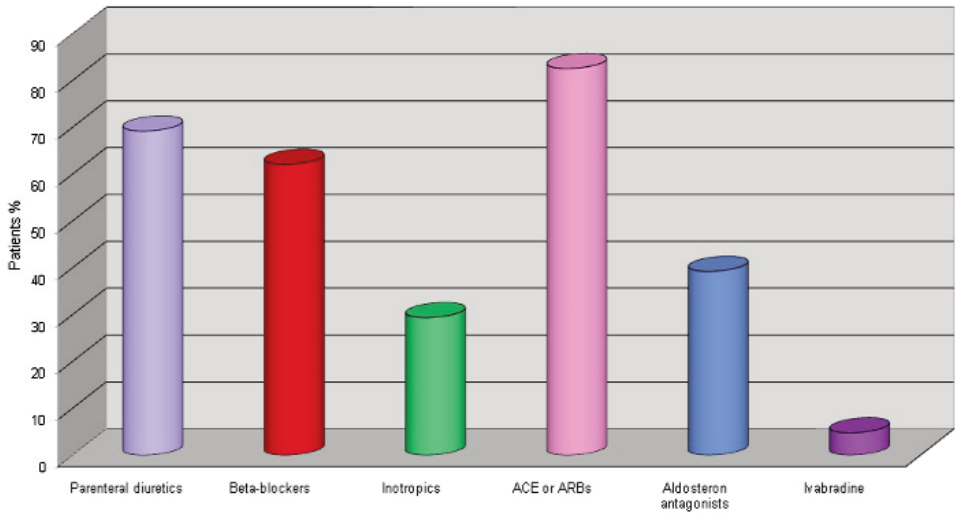

Figure 5. Distribution according to therapeutic classes

disease were the main causes of heart failure in the United States and Europe (1). In recent years, coronary artery disease and diabetes mellitus have become the primary causes of heart failure, while hypertension and valvular diseases have decreased as causes of heart failure, due to progresses in diagnosis and therapy (2, 3, 4). In less developped countries the data about the causes of heart failure is scarce. The

fact that in our study hypertension was the leading cause of heart failure (45.92%) may correlate with the younger mean age of our subjects comparing to the mean age of patients with heart failure (2, 3). Diabetes mellitus increases the risk of heart failure independent of coronary artery disease and hypertension (5, 6). In our study, 16.51% of patients had heart failure due to diabetic cardiomyopathy.

Discharge from a heart failure hospitalization is followed by a readmission within 30 days in approx. 24% of cases (7). Recurrent heart failure and related cardiovascular conditions account for only about half of readmissions in patients with heart failure (7). Our study revealed a lower post-discharge 90-day rehospitalization due to heart failure, of only 6.7%. A possible explanation is that some patients might have addressed to other hospitals.

22% of our heart failure patients have been diagnosed with chronic kidney disease. Heart failure is frequently accompanied by a reduction in glomerular filtration rate (GFR) via different mechanisms. The prevalence of moderate to severe chronic kidney disease (defined as a GFR < 60 mL/min/1.73 m^2) is approximately 30-40% in heart failure patients (8, 9). A variety of factors can contribute to a reduction in GFR in patients with heart failure. The major mechanisms that have been evaluated include neurohumoral adaptations, reduced renal perfusion, increased renal venous pressure, and right ventricular dysfunction.

European Society of Cardiology Guidelines for Heart Failure (10) recommend angiotensin-converting enzyme (ACE) inhibitors as a main therapeutic class for heart failure (recommendation class I, level of evidence A), because these drugs have proven their benefit in controlling the symptoms and reducing both hospitalization and mortality (11, 12). Angiotensin receptor blockers are recommended as an alternative in patients intolerant of an ACE inhibitor (13). Beta-blockers also play a key role in heart failure treatment. The treatment of our heart failure patients was according to guidelines, 82.55% of patients receiving angiotensin-converting enzyme inhibitors or angiotensin-receptor blockers and 62.11% receiving beta-blockers. A small percentage of patients (4.75%) received ivabradine for slowing the heart rate.

The effects of diuretics on mortality and morbidity have not been studied in patients with heart failure, unlike ACE inhibitors or beta-blockers. However, diuretics relieve dyspnea and edema and are recommended for this reason in patients with signs snd symptoms of congestion, irrespective of ejection fraction. The majority of patients can be trained to self-adjust the diuretic dose, by monitoring the symptoms and signs of congestion and daily weight measurement. Because the main reason of hospitalization in heart failure remains dyspnea due to congestion, almost 2/3 of our patients (69.21%) received parenteral diuretics (furosemide) during hospitalization. Seric electrolites must be carefully monitored during the treatment with diuretics, due to the risk of hyponatremia or hypokalemia, that can lead to cardiac arrhytmias or hyponatremic encephalopathy. Aldosterone receptor antagonists (spironolactone, eplerenone) have some proven benefits in heart failure patients and are recommended for all patients with persisting symptoms and an ejection fraction < 35%, despite treatment with an ACE inhibitor and a beta-blocker (10). In our study, a large number of patients (39.24%) received an aldosterone receptor antagonist, mainly spironolactone, associated to intravenous furosemide.

The prevalence of atrial fibrillation in patients with heart failure varies between 10-50%, depending in part upon the severity of heart failure and NYHA class (14). Atrial fibrillation may worsen symptoms in patients with heart failure and uncontrolled heart failure can precipitate or speed the ventricular response of atrial fibrillation or precipitate atrial fibrillation in patients in sinus rhythm. Most atrial fibrillation patients with heart failure need long-term anticoagulation due to significantly increased risk of embolization (15). For the prevention of thromboembolism in patients with heart failure and atrial fibrillation, acenocumarol was the preferred treatment in our group of study.

Our study sample demonstrated an in-hospital mortality rate of 5.96%, lower than that shown by other studies. One possible explanation is that the mortality rate in our study was considered to be as case-fatality rate; in that situation, the mortality rate obtained in our study could be lower, because some patients had more than one chronic heart failure hospitalization during the 8 months study period. As expected, mortality increased with increasing disease severity and age.

CONCLUSIONS

The aim of our study was to examine clinical

characteristics, management and outcomes of patients with chronic heart failure consecutively admitted in the Internal Medicine Clinic of the Clinical Emergency Hospital of Bucharest. We found that the most common etiology of heart failure in the studied group was arterial hypertension, followed by coronary artery disease. There was a predominance of the male sex in our group of study. The majority of patients admitted with chronic heart failure were in advanced stages of heart failure (NYHA class III or IV). In our study, almost half (46%) of the patients were in sinus rhythm despite the predominance of NYHA class III-IV. Dyslipidemia and chronic kidney disease were the most common comorbidities. Almost 2/3 of the patients received parenteral diuretics for symptoms relief.

The study can help clinicians as well as health services policy makers to gain insights regarding the chronic heart failure management and outcomes, which can assist in making decisions regarding management of heart failure patients in order to optimize the outcomes. Heart failure remains a major health problem as it is the end stage of many cardiovascular disorders.

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