

Decompensated Heart Failure. What Are We Talking About?

Insuficiencia cardíaca descompensada. ¿De qué estamos hablando?

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ABSTRACT

The aim of this study was to know the problematic posed by a significant range of patients hospitalized for heart failure in private urban centers which do not receive patients referred with end-stage disease. Baseline characteristics and outcome of 865 consecutive elderly patients hospitalized due to heart failure were analyzed in two of the above-mentioned centers. Mean age was 81 years and 48% were women. Heart failure was of coronary etiology in 25.5% of cases and chagasic in 0.4%, and 78% of patients were hypertensive. Average comorbidities were 3 per patient. Half of the patients had preserved systolic function. Systolic blood pressure on admission was 145 mmHg and ≥ 170 mmHg in 25% of cases. Average hospital stay was 6 days and in-hospital mortality 6.13%. The one-year evolution of these patients is a matter of great concern, with 70% of readmissions and 40.12% mortality. It should be pointed out that half of the post discharge deaths were not due to heart failure.

Key words: Heart Failure - Follow-Up Studies

RESUMEN

El objetivo del trabajo es conocer la problemática de una franja significativa de pacientes hospitalizados por insuficiencia cardíaca en centros urbanos privados que no son receptores de derivaciones de pacientes en estadios avanzados. Se analizaron las características basales y la evolución de 865 pacientes consecutivos hospitalizados por insuficiencia cardíaca en dos centros con las características precitadas. Se trata de una población anciana –mediana de edad 81 años– 48% mujeres. La etiología coronaria era de 25,5%, y la chagásica, 0,4% y el 78%, hipertensos. El promedio de comorbilidades fue de 3 por paciente. La mitad tenía función sistólica preservada. La presión sistólica de ingreso fue de 145mmHg, y en el 25% fue ≥ 170 mmHg. La estadía promedio fue 6 días, y la mortalidad intrahospitalaria 6,13%. Es muy preocupante la evolución de estos pacientes al año, con un 70% de reinternación y 40,12% de mortalidad. Debe destacarse que cerca de la mitad de los fallecimientos posalta no fueron debido a insuficiencia cardíaca.

Palabras clave: Insuficiencia cardíaca - Estudios de seguimiento

Abbreviations

HF Heart failure
IQR Interquartile range

OR Odds ratio
SBP Systolic blood pressure

INTRODUCTION

The national registries on heart failure (HF) provide unquestionable information on this disease; (1-4) however their data condenses an average of reality. In a country with marked geographical, epidemiological and social differences, it is also important to understand the reality separated in homogeneous groups.

This study focuses on a significant segment of the population: patients admitted with HF in two urban private centers with a high rate of consultations due to proximity (as opposed to selective referrals from other centers). The purpose of our study was to examine the specific characteristics and outcome of this population

in order to identify its difficulties and postulate useful alternative strategies.

METHODS

All consecutive adult patients admitted with HF to the Coronary Care Unit were registered between February 2010 and December 2016 in two private centers of the Autonomous City of Buenos Aires. Follow-up was performed during hospital stay and continued for one year.

Decompensated HF was diagnosed in any patient admitted presenting signs and symptoms compatible with this condition, requiring intravenous medication according to the treating physician.

Baseline characteristics, form of presentation of adopted

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measures and in-hospital outcome were analyzed, as well as one-year follow-up to explore readmission and mortality. Only the first admission was considered as event and, in case of readmission and death, both were recorded.

The forms of presentation were divided into congestion, acute lung edema, anasarca, and low cardiac output/cardio-genic shock.

Statistical analysis

Quantitative variables were expressed as mean and standard deviation or median and 25%-75% interquartile range (IQR), according to their parametric or non-parametric distribution.

For variables with parametric distribution, Student's t test was used to compare between two groups and ANOVA when comparing three or more groups, and in the case of non-parametric distribution, the corresponding Wilcoxon test or the Kruskal-Wallis test were used.

Qualitative variables were expressed as percentages and statistical significance was analyzed with the chi-square test or Fischer's exact test for binary variables. Risk ratio was expressed as odds ratio (OR) with its corresponding 95% confidence interval (95% CI). Statistical significance was established for $p < 0.05$. Epi Info 7.0 software package was

used to perform the statistical analyses.

Ethical considerations

The study was evaluated and approved by the Ethics Committee and the Scientific Committee of the participating institutions.

RESULTS

A total of 865 patients were included in the study and at one year of follow up information was collected from 795 (92%). Population characteristics are presented in Table 1. In summary: average age was 81 years and 48% were women; there was relatively low prevalence of coronary heart disease (25.5%) and minimal of Chagas disease (0.4%); 37.1% of patients had no history of HF and 40.7% had preserved systolic function. There was elevated prevalence of comorbidities. Median systolic blood pressure on admission was 140 mmHg and in 25% of cases it was ≥ 170 mmHg. Hypertension (35%) was among the most frequent decompensating factors (Table 2).

	n=865	%
Age (years). Median (IQR).	81 (73-87)	
Female gender	414	47.8
Systolic dysfunction (LVEF <45%)	412	49.3
History of HF	544	62.9
HF etiology:		
Ischemic/necrotic	221	25.5
Valvular	173	20
Idiopathic/unknown (not studied)	212	24.5
Hypertensive	130	15
Chagasic	4	0.4
Others	129	15
Hypertension	681	78.7
Diabetes	217	25.1
Previous infarction	197	22.7
Chronic AF	285	32.9
COPD	134	15.5
Previous kidney failure	204	23.6
Dysthyroidism	162	18.7
Neoplasm	87	10
Stroke	80	9.2
Comorbidities/patient. Median (IQR)	3 (2-5)	
Physical examination		
Systolic blood pressure (mmHg). Median (IQR).	140 (120-170)	
Heart rate. Median (IQR).	90 (75-100)	49.1
Sinus rhythm on admission	425	
Hematocrit (%). Median (IQR).	37.5 (33.8-41)	
White blood cells/mm ³ . Median (IQR).	8,000 (6,700-11,900)	
Urea (mg/dl). Median (IQR).	54 (40-76)	
Creatinine (mg/dl). Median (IQR).	1.2 (0.9-1.5)	
Blood sodium/potassium (mEq/L). Median (IQR).	138 (135-141)/4.1 (3.7-4.6)	
Blood glucose (mg/dl). Median (IQR).	126 (106-162)	
NT proBNP (pg/ml). Median (IQR)	3,947 (1,559-8,000)	

Table 1. Patient characteristics on admission

IQR: 25-75% interquartile range. LVEF: Left ventricular ejection fraction. HF: Heart failure. AF: Atrial fibrillation. COPD: Chronic obstructive pulmonary disease.

The presentation forms were: 63% congestion, 34% acute lung edema, and very low rate of anasarca (2%) and cardiogenic shock (1%).

Intravenous diuretics were used in 96.5% of patients, vasodilators in 51.5% and inotropic agents in 12.6%. Non-invasive ventilation was necessary in 15% of cases. At hospital discharge, 54.22% of patients were prescribed beta-blockers, 19.5% ACEI/ARB 2 and 19.6% anti-aldosterone agents. Analyzing only patients with systolic dysfunction, beta-blockers, ACEI/ARB 2 and anti-aldosterone agents were used in 69.8%, 26.8% and 26.5% of cases, respectively.

Median hospital stay was 6 days (IQR: 4-9) and in-hospital mortality was 6.13% (53 patients)

Among discharged patients, readmission was 70.2% and mortality 40.12%. Figure 1 presents the distribution of deaths by periods and by cause. Heart failure was the main cause of mortality in only 37% of deaths.

DISCUSSION

Knowing the patients we take care of is essential to identify their problems and improve the therapeutic strategy. This survey represents a very qualified segment of patients admitted to centers where they perform their first consultation.

In most cases, they present to these centers due to proximity (either spontaneously or by ambulance) and the information is not influenced by referral of high risk patients. Different from wide national registries reporting the average of different realities, this survey

is limited to a homogeneous population. Therefore, it may contribute to the decision of conduct strategies in centers with similar characteristics, representing a significant range of urban areas.

The study points out the advanced age of the patients (81 years), evidently higher than that of national registries, where the average is 74 years. (1-4) This information suggests special characteristics: comorbidities, poor functional capacity and frequent cognitive impairment. Also, in general, these patients are polymedicated, with low tolerance to drugs and consequently a subtherapeutic scheme for their HF. (5)

As expected, the prevalence of women increases with age, same as patients with preserved or mildly impaired systolic function.

With a clear therapeutic implication, blood pressure levels on admission were high; half of the patients had SBP >140 mmHg and in 25% \geq 170 mmHg. Hypertension as cause of decompensation was present in 35% of patients, but it is possible that it has also been a frequent fundamental factor in other causes of decompensation (medication abandonment, dietary transgression). Other analyses considering similar populations have also agreed about elevated blood pressure on admission. (6) It is possible that a better approach to the hypertensive patient may reduce the incidence of decompensated HF.

The high prevalence of comorbidities (3 per patient) directs us to a vulnerable, high risk population, (7) even without considering HF. This explains that 63% of deaths are not attributable to HF as its main cause.

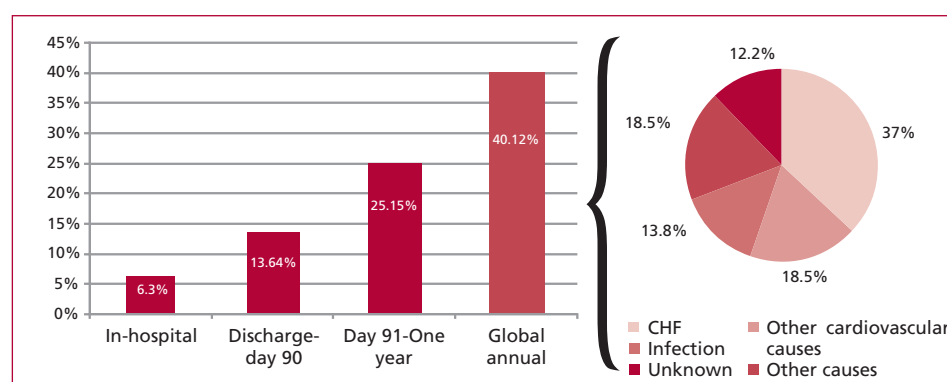
In this population, there was minimal prevalence of chagasic etiology. Even though a subdiagnosis cannot be ruled out, it is probable that this result is accurate due to the urban origin of the population.

The heart of the problem does not seem to be the hospital stage, but the high rate of readmissions and mortality observed after patient discharge; 70% of readmissions and 40% mortality are significant figures, indicating a challenge to be overcome. In Medicare patients, Kociol et al. observed similar percentages. (8) The Italian registry ARNO, developed from an administrative database found that 56.6% of patients had at least one readmission. (9) In the European registry,

Table 2. Causes of decompensation.

Causes	%
Progression of the underlying disease	8
Treatment discontinuation	9
Arrhythmia	11
Dietary transgression	6
Hypertension	35
Infection	15
Acute ischemic syndrome	2
Without trigger	9
Others	5

Fig. 1. Distribution of mortality by periods and causes



mortality at one-year was 23.6% in a population 12 years younger. (10)

Among patients recruited in Argentina for the same registry, readmission was 45.6% and one-year mortality reached 20.8%; (1) however, in both cases the population was almost 10 years younger.

It is important to emphasize the high percentage of deaths that do not acknowledge HF as its main cause. Although it is possible to associate this result with the great therapeutic progress for the treatment of this disease, (9, 11) we assume that it is due to the characteristics of the population. As patient age increases together with those with preserved ejection fraction, the probability that events (deaths or rehospitalization) are due to causes different from HF, increases. (12, 13)

It is, however, possible that HF has a facilitating role for the development or worsening of other pathological conditions, as it enhances patient vulnerability. In this sense, the possibility of increasing predischage prescription of neurohormonal antagonists should be reassessed, albeit we have no evidence in this respect, especially in a population as frail as the one included in this study. (14, 15)

CONCLUSION

The information provided by this study is representative of patients with decompensated HF treated in centers of the above-described characteristics. The challenge is prevention (specially the control of blood pressure), both to avoid decompensation as to reduce readmission and death after discharge. Due to the high prevalence of comorbidities and the fact that half of the deaths do not recognize HF as its main cause, it is essential to have a multidisciplinary approach of these patients.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/ Supplementary material)

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