Heart Failure Laboratory: Experience in a University Hospital

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Abstract

Introduction: Most of the management of patients with heart failure (HF) is accomplished on an outpatient basis. Adherence to the recommended treatment standards and access to the health system determine their evolution. We describe our experience with patients with ambulatory HF in a University Hospital.

Material and Methods: Patients referred for inter-consultation to the HF Laboratory between the months of January 2021 and October 2022 were included. A structured intervention was carried out, which included face-to-face visits and follow-up by email and/or telephone and nutritional advice.

Results: 98 patients were included. The mean age was 64.05 years. The total mean LVEF was 36.26%. A significant association was observed between those over 60 years of age (n = 65; 66.33%) and dyslipidemia, arterial hypertension, oncological disease, and coronary disease, compared to younger individuals. The low LVEF was correlated with coronary and oncological disease. In them was observed greater use of beta-blockers, ARNI, iSGLT2, and acetylsalicylic acid. Male sex, decreased LVEF and age were predictors of a worse prognosis.

Conclusion: The use of pharmacological treatment in HF depends on multiple factors. Despite this, a distribution of the established therapy according to the guideline recommendation and national registries and hospitalizations of patients with HF was observed.

Keywords: Heart Failure; Treatment Adherence; Hospital Care

Introduction

Heart failure (IC) is one of the most incidence diseases, which generates the most hospitalizations and expenses to health systems in the Western world. It affects 2 - 3% of the general population but increases to more than 10% in those over 70 years. It is the common final route for the majority of heart diseases not properly treated [1,2]. Markedly affects the forecast and its associated morbidity and mortality is high [3]. Records of acute IC in different countries and contexts have been made [4,5]; In our country the most recent and with the largest number of patients is argen IC [6]. Recently, the results of the Office IC AR registry were published that specifically represents patients with chronic IC in outpatient monitor More relevant, therefore the appropriate daily behavior by the patient, the adherence to the recommended treatment standards and rapid access to the health system determine evolution. In the same way, the analysis of disparity in the degree of medical adhesion to guide indications in relation to pharmacological treatment is considered interesting [7-9]. Our country is no exception; in addition, the corporate records may not be truly considered representative of the Argentine reality since the geographical area effectively covered by the Argentine Society of Cardiology and the Argentine Federation of Cardiology is different from other rural areas [10]. On the other hand, the medical coverage systems vary significantly according to geographic zone or Medical Institution.

The primary objective of our registry was to describe a population of patients in follow-up by IC in a university hospital, in this case dependent on the University of Buenos Aires, including patient characteristics, use of diagnostic and therapeutic resources, adherence to the guides and prognosis of patients with ischemic-necrotic heart disease.

Methodology

A descriptive and comparative study of cross-section was conducted. Derived patients were included for inter-consultation to the IC Laboratory of the José de San Martín Clinics between the months of January 2021 and October 2022. A structured intervention with regular monitoring of the patient was performed, which included face-to-face visits and follow-up by email and /or telephone, in addition to nutritional advice. Basal characteristics, echocardiographic measurements, and

pharmacological treatment were described. The variables of relevance of the ischemic etiology were considered according to gender, age group, deterioration of the FEVI, and functional class. The incidence of hospitalization and survival after a year of monitoring was evaluated. It was considered as an ejection fraction of the left ventricle (FEVI) low if it was less than 50%, and also considered FEVI less than 40% to compare drug use, and a high plasma creatinine if it was greater than 1.2 mg/dl. The population was divided into older and children under 60 years of age. There were no exclusion criteria. The categorical variables were expressed as absolute values and percentages, and the continuous variables with average and standard deviation (of), assuming normal distributions. For the statistical comparison of the discrete variables, the Chi2 test and Student T test for continuous variables were used. A value of $p < 0.05$ was considered significant. Stata 11.1 software was used.

Results

98 patients were included. The average age was 64.05 years (12.59) and 42.86% were female. The basal characteristics of the population can be observed in Table 1, and pharmacological treatment in Figure 1. 77.55% had sinus rhythm, 20.41% atrial fibrillation, and 2.04% pacemaker rhythm. 13.27% were CDI bearers and 8.16% were resynchronizer.

The total FEVI average was 36.26% (of 12.79) and 85.71% had a FEVI of less than 50% (n = 84). PSAP's average was 36.03 mmHg.

The male sex was significantly associated with greater coronary heart disease (86.67 vs. 13.33; $p < 0.001$) and CDI carrying (92.31 vs. 7.69; $p = 0.006$).

A significant association was observed between those over 60 years
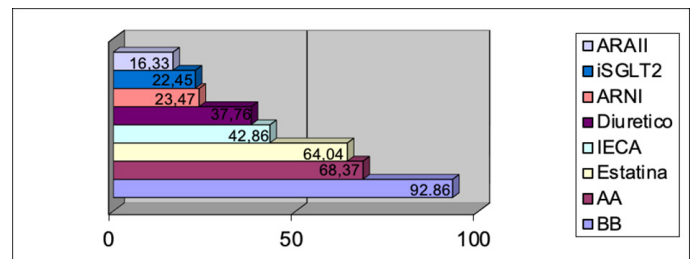

Figure 1: Pharmacological treatment.

(n = 65; 66.33%) and dyslipidemia ($p = 0.001$), arterial hypertension ($p = 0.03$), oncological disease ($p = 0.03$) and coronary heart disease ($p = 0.04$), compared to younger individuals.

The low number of patients who presented in functional class III was associated with higher creatinine values than the rest ($p = 0.03$) and a greater PSAP (45 vs. 34.80 mmHg; $p = 0.07$).

Low FEVI (n = 81; 82.65%) correlated with coronary heart carriers ($p = 0.03$) and oncological disease ($p = 0.006$). They observed a statistically significant difference in the pharmacological treatment with greater use of beta-blockers ($p < 0.001$), RNAI ($p = 0.02$), ISGLT2 ($p = 0.02$), and salicylic acetyl acid ($p < 0.001$). Likewise, with respect to the ischemic, idiopathic etiology, cardiotoxicity, valvular and Chagásica, 96.5%, 100%, 62.5%, 75%, and 100% had Lower Low, respectively. The ischemic etiology was more frequent in the male sex (88.46% vs. 11.54%; $p < 0.001$); 96.15% (n = 25) had FEVI <50% and 73.07% (n = 19) had FEVI <40% (Table 2). 95.24% of all patients with FEVI < 40% were under treatment with triple therapy. For the patients with ischemic etiology, there were 6 re-interactions (four per IC, one per device implant, and one by venous thrombosis). Among those reinterred by IC, all male and with FEVI ≤ 30%, half had atrial fibrillation, half had a glomerular filter < 60 ml/min/1.73 m² per ckd-epi, and 75% were without triple therapy. One of them died in hospitalization.

Table 1: Basal characteristics.

Coverage	n	%
PAMI (national public post-retirement health care organization)	41	41,84
Without signal	44	44,90
Other	13	13,27
Etiology		
Idiopathic	27	27,84
Ischemic	26	26,80
Cardiotoxicity	16	16,49
Chagasica	9	9,28
Valvular	4	4,12
Renal	2	2,06
Hypertrophic	1	1,03
Hypertensive	1	1,03
Others (myocarditis, tachimiocardiopathy, MNC, family, HP)	11	11,34
Functional class		
Yo	37	38,95
II	51	53,68
III	7	7,40
Cardiovascular risk factors		
Arterial hypertension	59	60,20
Dyslipremia	50	51,55
Smoking	41	41,84
Oncological disease	32	32,65
Coronary heart disease	30	30,93
Anemia	20	22,22
Diabetes	19	19,39
Chagas	16	16,33

Note: MNC: Non-compact myocardium; HP: Pulmonary hypertension.

Table 2: Etiology.

Etiology	Ischemic (n = 26)	Ischemic + FEVI < 40% (n = 19)
	n (%)	n (%)
Age (average, DE)	67,42 (1,96)	66,84 (10,73)
Male sex	23 (88,46)	17 (89,47)
Female sex	3 (11,54)	2 (10,53)
> 60 years	20 (76,92)	14 (73,68)
%FEY (mean, DE)	34,50 (2,11)	29,00 (7,70)
PSAP (mean, DE)	28,73 (2,15)	30,18 (7,87)
FUNCTIONAL CLASS I-II	24 (92,30)	17 (94,44)
HTA	23 (88,46)	15 (78,95)
Dyslipremia	23 (88,46)	18 (94,74)
Diabetes	6 (23,08)	3 (15,79)
Smoking	16 (61,54)	12 (63,16)
Diuretics	9 (34,62)	7 (36,84)
Beta Blockers	26 (100,00)	18 (94,74)
IECA	8 (30,77)	5 (26,32)
ARAII	7 (26,92)	4 (21,05)
ARNI	6 (23,08)	7 (36,84)
ISGLT2	4 (15,38)	4 (21,05)
AA	20 (76,92)	17 (89,47)
Statins	24 (100,00)	17 (100,00)
Triple therapy	6 (28,57)	6 (37,50)

Note: DE: Standard deviation; HT: Arterial hypertension; IECA: Angiotensin-converting enzyme inhibitors; ARAII: Angiotensin II receptor antagonists; ARNI: Angiotensin-Neprilisin receptor inhibitor; ISGLT2: Type 2 sodium-glucose collection inhibitors; and AA: Mineralocorticoid antagonists.

Discussion

Our registration included 98 patients who were referred to the IC laboratory and the result of the analysis showed that the male gender, the diminished FEVI, and the age were predictors of a worse prognosis. While this information is worldwide, we can observe that in our experience, this evolution does not discriminate etiology (70% of the etiologies are composed of idiopathic, ischemic, and cardiotoxicity) or socio-economic state (45% of patients without coverage).

It is inevitable to compare our results with those of the Office IC AR registry, where we have observed similarities in terms of gender, age group, and cardiovascular risk factors; Meanwhile, we find differences in the etiology of IC (higher prevalence of idiopathic vs. ischemic). Our laboratory has a Cardio-Oncology program, and this reality explains that cardiotoxic causes are one of the main etiologies in our center, unlike other records made to date, in which this population is not represented.

In addition, in both records, the functional class I-II was the most prevalent (92.63% vs. 82.00%). We consider this data of extreme relevance because the current approach of the IC must focus on early detection and prevention.

As for the analysis of the socioeconomic situation, the main health coverage was PAMI. In our opinion, there is a big difference in the purchasing power of the population with particular attention present in the National Registry, which could have implications when analyzing the complete treatment.

According to the current recommendations for pharmacological treatment in individuals with reduced ejection fraction [11,12], we have reached satisfactory figures, with better adhesion and an even greater indication of beta-blockers (94.74%), anti-alesteronic (89.47%), and statins (100%). 37.00% received Triple Therapy, 36.84% ARNI, and 21.05% ISGLT2; While in the Office IC AR registry, the percentage of patients with triple therapy was 79.70%. Finally, the comparison around the percentage of device bearers was similar (12% vs. 10%). In the same way, when comparing our data with large international records of IC we find similarities in the functional class, age, ejection fraction, and pharmacological treatment (IECA/ARAII 91.7%, Beta blockers 92.9% and anti-foothills 67.8%, vs. 47.37%, 94.74% and 89.47%, respectively in our analysis). In the Champ HF Registry, which included outpatients with chronic IC, those with FEVI < 40% were medicated with IECA/Ara II, beta-blockers, and anti-alesteronic, 59.9%, 66.8%, and 33.1%, respectively; and 12.8% medicated with RNAI. In this study, 1% of patients simultaneously received an objective dose of IECA/ARAII/RNAI, beta-blockers, and anti-alesteronic [13,14]. As we have observed in our patients, often the advanced age, the lowest blood pressure, the most serious functional class, renal failure, or recent hospitalization by IC, possibly harmed the use or favored the lowest doses of medications.

In the European Registry the ischemic etiology was predominant in 48.6% of the population, data that makes an important difference in relation to our work [12].

In short, the prevalence of IC continues to increase worldwide, particularly in the third age, and the prognosis remains unfavorable despite efforts in early diagnosis and treatment with scientific evidence of prognostic improvement.

In our work, the percentage of heart disease of ischemic-necrotic origin and its evolution per year was similar to that of the Argentine Registry of Ambulatory IC. On the other hand, the high percentage of patients without medical coverage makes it difficult to meet the recommended treatment objectives but, despite this, the percentage of CDI placement (12.7%) remained at standard levels, both in heart disease of Ischemic origin as Chagasic, in the same way as what was observed in records with medical coverage close to 90% [7].

Finally, in the last two years, only 7% of patients who attended cardiovascular rehabilitation (RCV) in our hospital were derived by IC. 75% adhered without complications to the RCV at a distance, with an improvement of functional capacity and quality of life. Undoubtedly, the substantial gain in the quality of life-related to health emphasizes the importance of its combination with current pharmacological therapy such as the "fifth pillar" of the management of IC [15-19].

Conclusion

The use of pharmacological treatment in IC depends on multiple factors. Despite this, a distribution of the therapy established according to the national guidance and international records recommendation and international patients with CI was observed.

The effort made to maintain quality standards regarding pharmacological therapies and electrical therapies (CDI) is of particular interest, taking into account that 45% of the analyzed population do not have any type of medical coverage and in many cases their socioeconomic status it is unfavorable to adhere to treatments that suppose a high cost.

Finally, the evolution of the subgroup of patients with myocardiopathy of ischemic-necrotic origin is highlighted, being similar in terms of re-international and cardiovascular mortality compared to other records.

Conflict of Interest

The authors declare that they have no conflicts of interest. The article was sent with the consent of all authors for their evaluation and publication.

Ethics Statement

Work has been approved by the ethics committee responsible in the workplace, and does not declare means of financing of the work carried out.

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