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Epidemiology, Clinical and Paraclinical Profiles of Heart Failure in Elderly Patients: A Cross-Sectional Study in Cameroon

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Abstract

Background: Heart failure (HF) is a major cause of morbidity and mortality worldwide, with a growing burden in sub-Saharan Africa. Data remain limited in Cameroon, particularly among older adults. This study aimed to describe the epidemiologic, clinical, and paraclinical profile of geriatric patients admitted for HF in two hospitals in Yaoundé. **Methods:** We conducted a cross-sectional study with a retrospective and prospective phase of data collection over six months (November 2021-April 2022) in the cardiology units of the Yaoundé Central Hospital and the Yaoundé General Hospital which are on our pyramid of our national health care facilities on the top. We aimed then to carry out this study in those highest level of care facilities. Patients aged ≥65 years with a diagnosis of HF based on clinical and echocardiographic criteria were included. Sociodemographic, clinical, geriatric, and paraclinical data were collected after informed patient consent. Analyses were performed using SPSS 23.0, with results expressed as means and proportions. The hospital prevalence was calculated by the ratio of patients above 65 years old admitted for heart failure over all the patients above 65 years old admitted in the selected hospitals during our period of study. We did not include in the study patients aged less than 65 years old, incomplete records and medical files without a clear diagnosis of deep veinous thrombosis (DVT) and or pulmonary embolism (PE). **Results:** 267 elderly patients have been admitted in those two hospitals among which 92 presented with heart failure. We included 63 elderly patients with HF, giving a hospital prevalence of 34.5% (95% CI: 28.9 - 40.2). The mean age was 75.0 ± 6.4 years. Hypertension (81.0%) and sedentary lifestyle (74.6%) were the most frequent risk factors. Acute decompensated HF was the com-

monest presentation (38.1%), and therapeutic non-compliance the leading precipitating factor (83.3%) for decompensation. Dyspnea (95.2%) and peripheral edema (82.5%) predominated as symptoms at presentation. On examination, jugular venous distension, hepatomegaly, ascites, basal crackles, and pulmonary congestion were frequently found. Frailty was the most common geriatric syndrome (42.9%). The majority of patients (58.7%) had HF with a preserved LVEF. **Conclusion:** In our context, studies on heart failure are common but to the best of our knowledge, this is the first study focusing on elderly patients. We have then found out that, the hospital prevalence of heart failure in elderly patients was 34.5% with a confidence interval of 28.9% - 40.2% which was high in our milieu due the high prevalence of uncontrolled hypertension among those group of patients. Dyspnea (95.2%) and peripheral edema (82.5%) was the predominated symptoms at presentation. Frailty was the most common geriatric syndrome (42.9%). The majority of patients (58.7%) had Left Hypertrophy associated with a preserved LVEF.

Keywords

Heart Failure, Elderly, Cameroon

1. Introduction

Heart failure (HF) represents the final common pathway of many cardiovascular diseases and is associated with high morbidity and mortality [1]. Globally, more than 64 million people are affected, with prevalence rising sharply in those over 65 years [2]. In sub-Saharan Africa, HF accounts for up to 30% of cardiovascular hospital admissions and contributes substantially to mortality [3].

In Cameroon, HF is increasingly encountered, yet published data on its epidemiologic, clinical, and paraclinical characteristics in older adults is sparse. Understanding the local profile is crucial for prevention, timely diagnosis, and appropriate management. This study therefore aimed to describe the epidemiologic, clinical, and paraclinical profile of HF in elderly patients admitted in two tertiary hospitals in Yaoundé.

2. Methods

Study design and setting: We carried out a retrospective cross-sectional study supplemented by prospective data collection from November 2021 to April 2022 in the cardiology units of the Yaoundé Central Hospital and the Yaoundé General Hospital; Cameroon.

Study population: Patients aged ≥65 years with HF were included. Patients aged ≥65 years with a diagnosis of HF based on clinical and echocardiographic criteria were included. Sociodemographic, clinical, geriatric, and paraclinical data were collected after informed patient consent. Analyses were performed using SPSS 23.0, with results expressed as means and proportions. The hospital prevalence was calculated by the ratio of patients above 65 years old admitted for heart

failure over all the patients above 65 years old admitted in the selected hospitals during our period of study. We did not include in the study patients aged less than 65 years old, incomplete records and medical files without a clear diagnosis of deep veinous thrombosis (DVT) and or pulmonary embolism (PE). The diagnosis of HF was based on symptoms and signs supported by echocardiographic findings. The ICOPE question via the application dedicated was used by the geriatrician to assess the geriatric syndrome.

Data collection: Data was extracted from medical records and supplemented with prospective interviews. Variables included: sociodemographic characteristics, cardiovascular risk factors, comorbidities, presenting symptoms and signs, decompensating factors, geriatric syndromes (according to the ICOPE, MNA-SF and Rockwood questionnaires), and paraclinical investigations.

Statistical analysis: Data was entered and analysed using SPSS version 23.0. Continuous variables were expressed as mean ± standard deviation and categorical variables as frequencies and percentages. Statistical significance was set at $p < 0.05$.

Ethical considerations: Ethical clearance No. 173/UY1/FMSB/VDRC/CSD was obtained from the Institutional Ethics Committee of the Faculty of Medicine and Biomedical Sciences; University of Yaoundé I. Administrative authorization was granted by the two hospitals. Confidentiality was maintained.

3. Results

3.1. Sociodemographic Characteristics and Comorbidities

A total of 63 patients were included, corresponding to a hospital prevalence of 34.5% (CI: 28.9 - 40.2). The mean age was 75.0 ± 6.4 years. The age group 70 - 79 years was most represented. There was a female predominance, with a sex ratio (M/F) of 0.5 (Table 1).

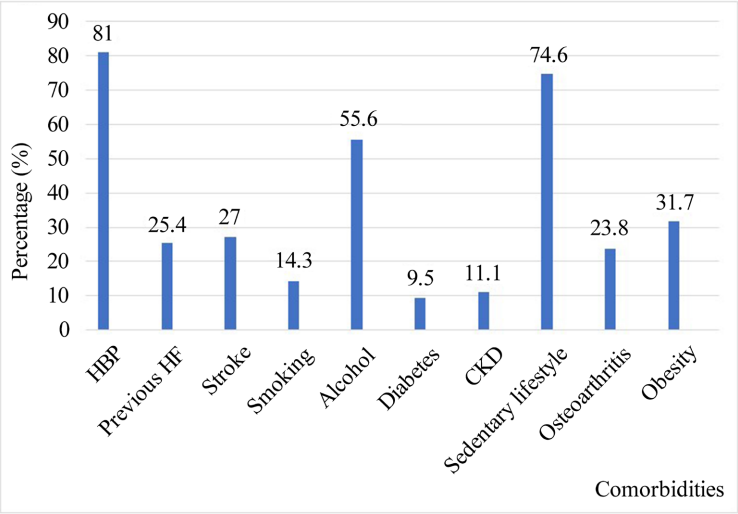
Table 1. Sociodemographic characteristics of study Population.

Sociodemographic Characteristics	Total	Percentages (%)
Age Ranges		
[65 - 75[	32	50.8
[75 - 85[	24	38.1
≥85	7	11.1
Sex		
Male	21	33.3
Female	42	66.7
Educational Level		
No formal education	19	30.2
Primary	26	41.3
Secondary	13	20.6
Higher	5	7.9

Continued

Employment status		
Active service	18	28.6
Retired	45	71.4
Marital Status		
Single	11	17.5
Married	28	44.4
Divorced	18	28.6
Widow/widower	6	9.5

Hypertension was present in 81.0% of patients being the most common comorbidity followed by a sedentary lifestyle in 74.6% (Figure 1).



HBP: High Blood Pressure; HF: Heart Failure; CKD: Chronic Kidney Disease.

Figure 1. Comorbidities and Cardiovascular risk factors.

3.2. Clinical Profile

Overall, 52 (82.5%) had global heart-failure symptoms. The most frequent symptom was dyspnea on exertion (n = 53; 84.1%). Six patients (9.5%) were asymptomatic at baseline.

The most frequent NYHA class of dyspnea was stage III (n = 21; 33.3%) followed by stage II (n = 20; 31.7%).

At admission 33 (52.4%) had an elevated blood pressure and 42 (66.7%) were polypneic (>20 cycles/min); altered consciousness (GCS < 15) occurred in 6 patients (9.5%). Concerning the signs of HF, right heart failure signs were present in majority of patients: lower-limb edema 41 (65.1%), jugular venous distension 38 (60.3%). Left heart failure signs were dominated by crackles 29 (46.0%) followed by displaced apex beat 25 (39.7). (See Table 2). 41 patients (65.1%) of our study population were admitted with 24 patients being admitted for Acute Heart Fail-

ure. Of the 24 patients admitted for acute HF, 21 (87.5%) had congestive HF and 3 (12.5%) had acute pulmonary edema. The dominant decompensating factor recorded was non-adherence to treatment. (See Figure 2 and Table 3).

Table 2. Clinical profile of patients with HF in our study population.

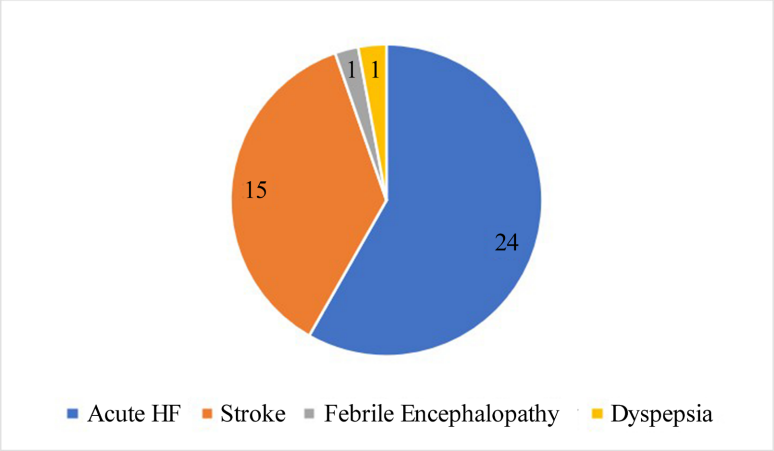
Variables	Study Population $N = 63$ (%)	Age range		
		[65 - 75[$n = 32$ (%)	[75 - 85[$n = 24$ (%)	≥85 $n = 7$ (%)
Symptoms of RHF				
Anorexia	22 (34.9)	5 (15.6)	11(45.8)	6 (85.7)
Hepatalgia	4 (6.3)	1 (3.1)	2 (8.3)	1 (14.1)
Symptoms of LHF				
Dyspnea on exertion	53 (84.1)	28 (87.5)	19 (79.2)	6 (85.7)
Orthopnea	19 (30.2)	9 (28.1)	9 (37.5)	1 (14.3)
Cough on effort or decubitus	15 (23.8)	7 (21.9)	7 (29.2)	1 (14.3)
Paroxysmal Nocturnal Dyspnea	1 (1.6)	1 (3.1)	0 (0)	0 (0)
Hemoptysis	1 (1.6)	0 (0)	1 (4.2)	0 (0)
NYHA stage				
Stage I	13 (20.6)	6 (18.8)	6 (25)	1(14.1)
Stage II	20 (31.7)	12 (37.5)	7 (29.2)	1 (14.1)
Stage III	21 (33.3)	10 (31.3)	8 (33.3)	3 (42.9)
Stage IV	9 (14.3)	4 (12.5)	3(12.5)	2 (28.7)
Vital Parameters				
Hypotension	2 (3.2)	2 (6.3)	0 (0)	0 (0)
Hypertension	33 (52.4)	15 (46.9)	15 (62.5)	3 (42.8)
Bradycardia (HR < 60)	8 (12.7)	4 (12.5)	3 (12.5)	1 (14.1)
Tachycardia (HR > 100)	16 (25.4)	10 (31.2)	4 (16.7)	2 (28.6)
Polypnea (RR > 20)	42 (66.7)	23 (71.9)	15 (62.5)	4 (57.1)
Hypoxia (SO2 < 95%)	17 (26.9)	7 (21.9)	7 (29.2)	3 (42.9)
Signs of RHF				
Oedema	41(65.1)	16 (50)	19 (79.2)	6 (85.7)
Jugular Veinous Distension	38 (60.3)	17 (53.1)	16 (66.7)	5 (71.4)
Hepatojugular Reflux	25 (39.7)	12 (37.5)	10 (41.7)	3 (42.9)
Harzer's sign	15 (23.8)	4 (12.5)	8 (33.3)	3 (42.9)
Functional Systolic Mumur	15 (23.8)	8 (25)	6 (25)	1 (14.3)
Hepatomegaly	9 (14.3)	0 (0)	7(29.2)	2 (28.6)
Ascitis	5 (7.9)	0 (0)	5 (20.8)	0 (0)
Signs of LHF				
Crackles	29 (46)	12 (37.5)	13 (54.2)	4 (57.1)
Deviated Apex Beat	25 (39.7)	17 (53.1)	7 (29.2)	1 (14.3)
Gallop Rythm (S3)	5 (7.9)	2 (6.3)	3 (12.5)	0 (0)

RHF: Right Heart failure, **LHF:** Left heart failure, **HR:** Heart rate, **RR:** Respiratory rate.

Table 3. Decompensating factors for HF and mode of decompensation of HF.

Variables	Acute HF *n* = 24 (%)	Age Range [65 - 75[*n* = 32	[75 - 85[*n* = 24	≥85 *n* = 7
Decompensating Factors				
Non-adherence to Treatment	20 (83.3)	9 (28.1)	9 (37.5)	7 (28.6)
Arrythmias	17 (70.8)	6 (18.7)	9 (37.5)	7 (28.6)
Infections	14 (58.3)	5 (15.6)	6 (25)	3 (42.8)
Anemia	13 (54.2)	6 (18.7)	4 (16.7)	3 (42.8)
Cardiac Conduction Blocks	5 (20.8)	1 (3.1)	4 (16.7)	0 (0)
Pulmonary Embolism	3 (12.5)	0 (0)	3 (12.5)	0 (0)
Myocardial Infaction	2 (8.3)	0 (0)	2 (8.3)	0 (0)
Mode of Decompensation of HF				
Congestive HF	21 (87.5)	8 (25)	11 (45.8)	3 (42.8)
Pulmonary Edema	3 (12.5)	1(3.1)	2 (8.3)	0 (0)

HF: Heart Failure.



HF: Heart Failure.

Figure 2. Distribution of admissions in study population.

3.3. Geriatric Syndromes

A geriatric evaluation carried out by a geriatrician with the ICOPE application was based on evaluating the intrinsic capacity by assessing the physical and mental capacities and frailty assessing the vulnerability to health issues. Thus, the decline in intrinsic capacity was the most common finding on comprehensive geriatric evaluation with 41 patients (65.1%) recorded as having a decreased intrinsic capacity. Frailty was present in 27 patients (42.9%). Both decrease intrinsic capacity and frailty were present in 100% of patients aged 85 years and above. Cognitive impairment was identified in 14 (22.2%), depressive symptoms in 23 (36.5%), malnutrition in 9 (14.3%), and social dependence in 19 (30.2%) (**Table 4**).

Table 4. Distribution of geriatric syndromes in study population.

Geriatric Syndrome	Study Population N = 63	Age Range		
		[65 - 75[*n* = 32	[75 - 85[*n* = 24	≥85 *n* = 7
Decline in Intrinsic capacity	41 (65.1)	14 (43.7)	20 (83.3)	7 (100)
Frailty	27 (42.9)	13 (40.6)	19 (79.2)	7 (100)
Depression	23 (36.5)	8 (25)	13(54.2)	2 (28.6)
Dependence	19 (30.2)	5 (15.6)	9 (37.5)	5 (71.4)
Cognitive Impairment	14 (22.2)	1 (3.2)	7 (29.2)	5 (71.4)
Malnutrition	9 (14.3)	3 (9.4)	2 (8.3)	4 (57.1)

3.4. Paraclinical Profile

Arrythmia was the most frequent ECG abnormality in the study population seen in 66.7% of patients with atrial fibrillation being the most common arrythmia; 39.7% of patients. Only 9 patients (14.3%) had signs of previous myocardial ischemia (Table 5). On cardiac echography, Left ventricular hypertrophy (LVH) was the predominant abnormality marked by eccentric LVH in 27 patients (42.8%), concentric LVH in 23 patients (36.5%) and concentric remodeling in 13 patients (20.6%). The majority of patients (58.7%) had a preserved LVEF while mildly reduced LVEF and reduced LVEF represented 17.5% and 23.8% respectively. Patients aged ≥ 85 years had the highest prevalence of reduced LVEF.

Table 5. Electrocardiographic abnormalities in our study population.

ECG Abnormality	Total	Percentage (%)
Arrythmia	42	66.7
Atrial Fibrillation	25	39.7
Ventricular Extrasystoles	13	20.6
Sinus Tachycardia	13	20.6
ECG Left Ventricular Hypertrophy	40	63.5
Conduction Abnormalities	19	30.2
First degree Atrioventricular block	5	7.9
Complete Right Bundle Branch Block	4	6.3
Repolarization Abnormalities	13	20.6
Pathologic Q waves	9	14.3
Left atrial Hypertrophy	9	14.3

Chest radiography showed cardiomegaly in 61.9% being the most common radiographic abnormality in the study population followed by pulmonary congestion in 23 patients (43.4%). Laboratory results found hypokalemia in 28.6%, anemia in 22.2%, and renal dysfunction in 15.9% of the patients (Table 6).

Table 6. Paraclinical profile of study population.

Paraclinical Characteristics	Study Population *n* = 63 (%)	Age Range		
		[65 - 75[*n* = 32 (%)	[75 - 85[*n* = 24 (%)	≥85 *n* = 7 (%)
Echography Characteristics				
Left Ventricular Ejection Fraction (%)				
≤40	15 (23.8)	7 (21.9)	5 (20.8)	3 (42.9)
41 - 49	11 (17.5)	8 (25)	3 (12.5)	0 (0)
≥50	37 (58.7)	17(53.1)	16 (66.7)	4 (57.1)
Left atrial dilatation	48 (76.2)	22 (68.7)	19 (79.2)	7 (100)
Diastolic Dysfunction	46 (73)	21 (65.6)	20 (83.3)	5 (71.4)
Left Ventricular Dilatation	37 (58.7)	16 (50)	17 (70.8)	4 (57.1)
Right Atrial Dilatation	37 (58.7)	14 (43.7)	18 (75)	5 (71.4)
Post Capillary Pulmonary hypertension	37 (58.7)	16 (50)	16 (66.7)	5 (71.4)
Valvulopathy	33 (52.4)	15 (46.8)	6 (25)	3 (42.8)
Eccentric Left Ventricular Hypertrophy	27(42.8)	16 (50)	10 (41.7)	1 (14.3)
Concentric Left Ventricular Hypertrophy	23(36.5)	13 (40.6)	6 (25)	4 (57.1)
Chest X ray Characteristics				
Cardiomegaly	39 (73.6)	15(46.9)	17 (62.9)	7 (100)
Interstitial Edema	23 (4.4)	7 (21.9)	13 (54.2)	3 (42.8)
Alveolar edema	21 (39.6)	7 (21.9)	11 (45.8)	3 (42.8)
Vascular redistribution to the summits	12 (22.4)	5 (15.6)	6 (25)	1 (14.3)
Pleural Effusion	6 (11.3)	1 (3.1)	3 (12.5)	2 (28.6)
Biologic Paraclinicals				
Anemia	32 (50.8)	16 (50)	13 (54.2)	3 (42.8)
Creatinine clearance <60 ml/min	32 (50.8)	10 (31.2)	15 (62.5)	7 (100)
Hypokalemia (<3.5 mmol/l)	18 (28.6)	8 (25)	9 (37.5)	1 (14.3)
Hyperkalemia (>5.5 mmol/l)	1 (1.6)	1(3.1)	0 (0)	0 (0)
Hyponatremia (<135 mmol/l)	15 (23.8)	8 (25)	5 (20.8)	2 (28.6)

4. Discussion

This study aimed to describe the epidemiologic, clinical, and paraclinical profile of HF in elderly patients admitted in two tertiary hospitals in Yaoundé.

4.1. Sociodemographic Characteristics and Comorbidities

In our study, the hospital prevalence of HF was 34.5% (CI: 28.9 - 40.2). This is similar to the 40.8% reported by Mfeukeu *et al.* in 2021 in the same hospitals [1], and to the 49.7% found by Bivigou *et al.* in Gabon in 2018 [4]. The mean age of our patients was 75.0 ± 6.4 years, with the 70 - 79 year group most represented.

This is close to the 66 ± 15 years reported by Mfeukeu *et al.* and the 57.4 ± 17 years reported by Bivigou *et al.* [1] [4]. Our average age is also consistent with data from developed countries where Saudubray *et al.* in France and Obata *et al.* in Japan reported averages of 79 and 84.7 years, respectively [5] [6]. The female predominance observed (sex ratio 0.5) has also been reported in other African and international series [1] [4].

Hypertension was the leading comorbidity (81.0%), followed by sedentary lifestyle (74.6%) and diabetes (28.6%). The frequency of hypertension in our series is higher than that reported in other African and Asian studies where prevalence usually ranges around 60% [4] [7]. This may be explained by the older age of our population, as vascular aging is an established contributor to hypertension.

4.2. Clinical Profile

Dyspnea on exertion was the most common symptom (84.1%), and the majority of patients were in NYHA class III (33.3%) or II (31.7%). These findings are consistent with reports from the literature that indicate advanced dyspnea is the predominant mode of presentation in African HF patients [8]-[10]. Altered consciousness was present in 9.5% of patients, reflecting the severity of decompensation and mechanisms as cerebral hypoxia and severe hyponatremia.

Acute HF was the most frequent mode of admission, observed in 38.1% of patients. This is higher than the 33.3% reported by Boombhi *et al.* in 2017 [11]. The main decompensating factor was non-adherence to treatment (83.3%), a finding similar to that of Bivigou *et al.* in Libreville who reported 88.6% [4]. This result is also in line with Kuate *et al.*, who found a prevalence of 35.3% in 2021 [1]. Poor treatment adherence has been widely described among African HF patients, explained in part by low therapeutic education and socioeconomic constraints [1] [12]. In deed, in our milieu, there is no national medical support in terms of social insurance. Therefore each patient has to afford his management which limits the adherence and when it comes ton therapeutic education, if consider all the previous cross sectional studies carried out, the majority of patients were not aware of the long term aspect of their treatment. Besides in our milieu, its very difficult for the families to invest a lot of finances in elderly patients for according to them their prognosis most of the time are unfavorable.

Signs of right heart failure were predominant, particularly lower-limb edema (65.1%) and jugular venous distension (60.3%), while left-sided signs were dominated by crackles (46.0%). These findings are comparable to those from earlier Cameroonian series [9].

4.3. Geriatric Profile

Decline in intrinsic capacity was the most common finding on comprehensive geriatric evaluation. Frailty was documented in 42.9% consistent with the range of 15% - 74% reported internationally [13]. Our results differ from those of Essomba *et al.*, who found dependence as the most frequent geriatric syndrome

(70.5%) [14], while in our study dependence was noted in only 30.2% of patients. This discrepancy may be related to differences in assessment tools, since Essomba *et al.* used the ADL scale while we applied the ICOPE questionnaire.

Malnutrition was present in 14.3%, with prevalence rising in patients ≥85 years. Obata *et al.* in Japan reported 44.1% malnutrition assessed by GNRI [6]. Our prevalence is closer to that found by Essomba *et al.* in Cameroon (17%) [15], likely reflecting the use of the same MNA-SF tool.

4.4. Paraclinical Profile

Arrhythmia was the most common ECG abnormality, present in 66.7% of patients, with atrial fibrillation being the most frequent rhythm disorder (39.7%). These findings are in line with Sung *et al.* in China (33.8%) [7] and Obata *et al.* in Japan (53.8%). Signs of previous myocardial ischemia were present in 14.3%, reflecting the contribution of ischemic heart disease to HF in the elderly.

On echocardiography, preserved LVEF was the predominant phenotype (58.7%), while 17.5% had mildly reduced LVEF and 23.8% reduced LVEF. Boombhi *et al.* reported preserved EF in 49% [11], which is close to our result. As in other studies, patients ≥85 years in our series had a higher frequency of HF with reduced LVEF, suggesting age-related decline in systolic function.

4.5. Limitations

Our study has some limitations. First, the sample size was relatively small and limited to two hospitals, which may restrict the generalizability of our findings. Second, the cross-sectional design does not allow inference of causal relationships between comorbidities, precipitating factors, and outcomes. Third, some investigations such as BNP were rarely performed, reflecting local practice constraints, and this limited our ability to analyze their role in the clinical profile of HF. Finally, the use of retrospective medical records for part of the data collection may have introduced information bias.

5. Conclusion

Heart failure is frequent among elderly patients in the studied services, with a higher prevalence in women. Acute decompensated heart failure with preserved ejection fraction was the most common clinical presentation. Electrocardiographic and echocardiographic abnormalities, including atrial fibrillation and left ventricular hypertrophy, were frequent. Functional decline and frailty were common in this population.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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