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Sociodemographic, Clinical, Paraclinical, Therapeutic and Evolutionary Profile of Heart Failure with Preserved Ejection Fraction (HFpEF) in an African Cardiology Setting

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Abstract

Objective: To study the clinical, paraclinical, evolutionary and therapeutic aspects of heart failure with preserved ejection fraction, as well as the factors associated with death, in order to contribute to the improvement of care. **Method:** This was a retrospective, cross-sectional, and analytical study conducted over five years, from January 1, 2019, to December 31, 2023. It included patients aged 18 years and older with heart failure with preserved ejection fraction (HFpEF), diagnosed based on clinical, laboratory, and echocardiographic data. A total of 273 patients with HFpEF were included, representing a prevalence of 24% of heart failure patients in the internal medicine department of the ICA (Abidjan Cardiology Institute). Data were collected from medical records and recorded in a questionnaire. **Results:** Our study provided a detailed description of heart failure with preserved ejection fraction (HFpEF). The mean age of the patients was 54.89 ± 18.18 years, with a male predominance (59%). Patients were admitted in NYHA class IV (50%) and III (40%). The most frequently observed major risk factors were hypertension (61.9%), diabetes (19.05%), and obesity (11.72%). Heart failure was global (52%), left-sided (39%), and right-sided (7%), with acute renal failure (4.4%) and pneumonia (2.56%) as complications occurring during hospitalization. Cardiomegaly was noted in most patients on chest radiography. Atrial fibrillation, the most frequent electrocardiographic abnormality, was followed by left ventricular hypertrophy. The underlying heart disease was primarily hypertension (58.6%), followed by ischemic heart disease (9.52%). Comorbidities were mainly diabetes (7.3%), followed by coronary artery disease (6.96%). Treatment was exclusively medical, with the most frequently used medications be-

ing furosemide (79.89%), beta-blockers (56.7%), anticoagulants (50.1%), ACE inhibitors (49.8%), and gliflozins (2.2%). The outcome was favorable in the majority of patients, with a mortality rate of 9%. Factors associated with mortality related to HFpEF were the NYHA class and rhythm disturbances. **Conclusion:** In our series, Heart failure with preserved ejection fraction (HFpEF) increases with age and affects men more than women; it is often associated with hypertension and atrial fibrillation. Treatment options for HFpEF remain limited. Future prospective studies should lead to improvements in clinical and therapeutic approaches.

Keywords

Heart Failure with Preserved Ejection Fraction, Cardiovascular Risk Factors, Factors Related to Mortality

1. Introduction

Heart failure is a disease that affects approximately 26 million people worldwide [1]. This condition is responsible for 17.5 million deaths annually, representing 31% of global mortality [2]; it constitutes a major public health problem worldwide [3].

Heart failure is divided into three main types: heart failure with reduced ejection fraction (HFrEF), heart failure with moderate ejection fraction (HFmEF), and heart failure with preserved ejection fraction (HFpEF). In HFrEF, the left ventricular ejection fraction is less than 40%, in HFmEF it is between 41 and 49%, while in HFpEF it is greater than 50% [4].

Heart failure with preserved ejection fraction (HFpEF) affects approximately 3 million people in the United States and 13 million worldwide [5].

Studies conducted in sub-Saharan Africa have shown a growing incidence of this condition in the region. For example, a study in Cameroon found that HFpEF accounted for 10% of heart failure cases in a cardiology department in Yaoundé. Furthermore, a comparative study at the Abidjan Heart Institute showed that HFpEF was present in 25% of heart failure patients. These figures indicate that HFpEF is a growing public health problem in sub-Saharan Africa [6] [7].

HFpEF is associated with high morbidity and mortality, as well as a poor prognosis [5]. The prognosis of patients with HFpEF is influenced by several factors, including clinical and individual characteristics as well as associated complications [8].

Predictors of mortality related to HFpEF vary worldwide. In Western countries, they are primarily hypertension, overweight, renal insufficiency, atrial fibrillation, tachycardia, loss of atrial systole, and cardiac arrhythmias [9] [10]. In sub-Saharan Africa, poor clinical and paraclinical prognostic factors include delayed treatment, severe cardiac involvement, and significant comorbidities [10]. In Côte d'Ivoire, despite its increasing prevalence and significant impact on mortality, predictors of mortality related to HFpEF remain poorly understood.

This study is justified by the need to address the lack of local information on predictive factors of mortality in patients with heart failure with preserved ejection fraction (HFpEF). Understanding the characteristics of patients treated at the Abidjan Cardiology Institute between 2019 and 2023 will allow for better targeting of medical interventions and the improvement of prevention and treatment strategies. By identifying specific risk factors, this study can contribute to reducing mortality and improving patients' quality of life; hence our main objective: to study predictive factors of mortality in patients with HFpEF.

A better understanding of these predictive factors will allow us to optimize the management of patients with HFpEF in order to reduce mortality.

2. Patients and Methods

This was a retrospective cross-sectional analytical study of the records of patients hospitalized for heart failure in the medical department of the Abidjan Cardiology Institute between January 2019 and December 2023, a period of 60 months.

We selected a total of 1137 patient records of individuals hospitalized for heart failure during the study period. Of these, 307 presented with heart failure, with 34 incomplete or unusable records, leaving 273 complete and usable records, resulting in a frequency of 273/1137, or 24%.

The inclusion criteria were as follows. Patients aged 18 years and older with heart failure with preserved ejection fraction (HFpEF), defined according to the 2021 ESC guidelines as the presence of symptoms and/or physical signs of heart failure with a left ventricular ejection fraction (LVEF) ≥ 50% associated with an elevated NT-proBNP level above 220 pg/ml and also structural abnormalities (the presence of left atrial > 34 ml/m^2 and/or left ventricular hypertrophy (LVH) and functional abnormalities (E/e ≥ 9 ; pulmonary arterial systolic pressure (PAPS)) > 35 mmHg).

Medical records of patients with heart failure and an LVEF < 50% were excluded.

The data were collected using a standardized survey form and univariate and multivariate analysis methods. The following factors were recorded: epidemiological (age, sex), clinical (cardiovascular risk factors, functional and physical signs, etiologies, comorbidities), paraclinical (electrocardiographic, echocardiographic, radiological and biological abnormalities), therapeutic (the fantastic 4), and evolutionary (mortality rate).

Data entry and analysis were performed using Microsoft Word 2016 and Excel 2016. For data analysis, we used SPSS 20 and Microsoft Excel 2016. Qualitative variables are expressed as proportions and quantitative variables are expressed as measures of central tendency and dispersion.

We also used univariate analysis methods to search for a statistically significant link between sociodemographic, clinical, paraclinical, therapeutic, and evolutionary variables and the occurrence of death.

Variables that showed a statistically significant association with the occurrence

of death were included in a multivariate regression model to control for confounding factors in order to identify predictors of mortality related to HFpEF. The significance level for the statistical tests was set at 0.05, with odds ratios (OR) calculated and a 95% confidence interval.

3. Results

In our study, the predictive factors associated with mortality in heart failure with preserved ejection fraction (HFpEF) are: advanced NYHA stages and rhythm disturbances exacerbated by atrial fibrillation (Table 1).

Table 1. Synopsis of sociodemographic, clinical, paraclinical, therapeutic and evolutionary data.

	Effective	Percentage (%)
Age		
≤40 years old	58	21.15
[40 - 60[	116	42.59
≥60	99	36.26
Sex		
Female	112	41
Male	161	59
Symptoms on admission		
Chest pain	101	37.00
Dyspnea	**208**	**76.19**
Fatigue	7	2.56
OMI	82	30.04
Palpitations	51	18.68
cardiovascular risk factors		
Diabetes	52	19.05
HTA	**169**	**61.90**
Hypercholesterolemia	20	7.33
Obesity	32	11.72
Sedentary lifestyle	13	4.76
Stress	7	2.56
Smoking	19	6.96
NYHA Stadium		
Step I	4	1.47
Stage II	24	8.79
Stage III	109	39.93
Stage IV	136	49.82

Continued

Type of heart failure		
Left Integrated Circuit	99	36.19
OAP	22	8.12
Intellectual property rights	15	5.33
Global IC	137	50.36
Comorbidities		
Coronary artery disease	19	6.96
Atrial fibrillation	13	4.76
Kidney failure	16	5.86
COPD	2	0.73
Diabetes	**20**	**7.33**
Anemia	13	4.76
Hyponatremia	5	1.83
Hypokalemia	4	1.47
Hyperkalemia	3	1.10
Hyperleukocytosis	3	1.10
Hypoglycemia	1	0.37
Complications		
IC refractory	8	2.93
Sudden death	1	0.37
Thromboembolic complications	1	0.37
Rhythmic complications	**19**	**6.96**
Cardiothoracic Index		
Pupil	246	90
Normal	27	10
Electrocardiogram		
HVG	79	28.94
HVD	15	5.49
HAG	19	6.96
HAD	8	2.93
Heart rhythm disorders	124	45.42
Conduction disorders	35	12.82
transthoracic echocardiography		
DTDVG (mm)	48.15 ± 9.08	
DTSVG (mm)	33.40 ± 7.10	
FEVG (%)	58.30 ± 7.17	
VOG (ml/m^2)	35.65 ± 12.42	
PAPS (mmHg)	51.28 ± 25.74	
E/É	17.3 ± 4.15	

Continued

Treatment		
ARA II	34	12.45
Beta blocker	155	56.78
Mineralocorticoid receptor antagonist	42	15.38
IEC	136	49.82
Diuretics	199	72.89
Digital	18	6.59
Anticoagulants	137	50.18
Antiplatelet agents	77	28.21
Antiarrhythmics	38	13.92
Stations	57	20.88
Nitrates	27	9.89
Calcium channel blockers	119	43.59
Sucabitril-valsartan	3	1.10
Glifozines	9	3.30
ARA II	34	12.45
Length of hospital stay		
≤7 days	214	78.29
8 to 14 days	40	14.55
15 - 21	12	4.30
≥21 days	7	2.86
Complications that occurred during hospitalization		
Acute renal failure	**12**	**4.40**
Arrhythmias	5	1.83
Anemia	7	2.56
Hypokalemia	3	1.10
Hyponatremia	6	2.20
Pneumonia	7	2.56
Thrombocytopenia	1	0.37
Bronchopneumopathy	1	0.37
Hepatic cytolysis	1	0.37
Evolution		
Life	248	91
Deceased	25	9
Rehospitalization		
Readmitted to the hospital	38	14
Not readmitted	235	86

The frequency of heart failure with preserved ejection fraction (HFpEF) was 24%, with a male predominance.

Patients were admitted primarily for NYHA stage IV dyspnea and with global heart failure in most cases (52.38%).

The etiology was dominated by hypertensive heart disease (58.61%), followed by ischemic heart disease (9.52%) (Table 2).

Table 2. Distribution of ICFEP patients according to etiology.

Etiologies	Effective	Percentage %
Hypertensive heart disease	160	58.61%
Ischemic heart disease	26	9.52%
HTAP/CPC	23	8.42%
CMH	7	2.56%
Restrictive heart disease	10	3.66%
Endocrine	2	0.73%

Several comorbidities were observed, primarily diabetes (7.33%), followed by coronary artery disease (6.96%). Treatments were exclusively pharmacological. Furosemide was used in 72.89% of patients, followed by beta-blockers (56.78%) and anticoagulants (50.18%). Complications occurring during hospitalization were dominated by acute renal failure (4.40%), followed by anemia and pneumonia (2.56%), then hyponatremia (2.20%), and finally arrhythmias (2.5%). The majority of patients with heart failure associated with comorbidities had a favorable outcome (Table 3).

Table 3. Logistic regression model for determining mortality risk factors.

Features	Full model			Scale model		
	Complete Gold	IC_95 Complete	Value Complete	GOLD Reduced	IC_95 Reduced	Reduced value
NYHA Stadium (Stadium 3)	2.65	[1.98 - 3.54]	<0.001	2.6	[1.94 - 3.49]	<0.001
NYHA Stadium (Stadium 4)	4.95	[3.52 - 6.96]	<0.001	4.82	[3.42 - 6.81]	<0.001
ECG (Arrhythmia)	2.65	[1.98 - 3.55]	<0.001	2.6	[1.94 - 3.49]	<0.001
Comorbidities (Atrial fibrillation)	2.25	[1.65 - 3.06]	<0.001	2.2	[1.61 - 2.99]	<0.001

4. Discussion

We encountered a major difficulty, namely the lack of data in medical records, which could compromise the quality of our results. Furthermore, given the retrospective nature of our study, we only assessed factors associated with in-hospital mortality, and these results cannot be extrapolated to predict mortality in patients who survived hospital discharge, were followed up in outpatient settings, and were subsequently lost to follow-up.

In our study, the prevalence of heart failure with preserved ejection fraction (HFpEF) was approximately 24% among hospitalized patients. This prevalence is close to those previously observed in Côte d'Ivoire (25%) [7] and Senegal (28.8%) [11]. Higher hospital prevalences have been reported in African studies, notably in Nigeria (39.5%) [12], while they were lower in other studies conducted in Cameroon (10%) [6] and Côte d'Ivoire (15%) [13]. On a regional or international scale (Latin America, Middle East, North Africa), this prevalence of HFpEF could reach 65% [14]. This difference in distribution could probably be explained by variations in the sample size of the studied population, the age of the patients, their ethnic origin, and the updated threshold values used to define left ventricular ejection fraction (LVEF) during the study.

Our study revealed a male predominance of HFpEF (59%), unlike the studies by Abebe in Ethiopia and Benjamin in the United States, which observed a female predominance in 76% and 63% of cases, respectively [15] [16]. Our results therefore suggest that men are more likely to develop HFpEF. The Framingham study, on the other hand, showed that female sex and atrial fibrillation were associated with a twofold increased risk of developing HFpEF [17].

The mean age of patients with heart failure in our study was 54.89 ± 18.18 years. In Africa, specifically in a study conducted in Togo, this mean age was 52 ± 16.7 years [18], and in a study conducted in Djibouti, it was 55 ± 12 years [19]. However, this mean age was significantly lower than that observed in American and European studies. In the latter, the mean age was 79 ± 7.6 years in the United States [20] and 71 ± 12 years in Europe [21]. This difference could be related to the lower life expectancy in sub-Saharan Africa.

Regarding clinical characteristics, in our study, hypertension was the main cardiovascular risk factor associated with heart failure with preserved ejection fraction (HFpEF), at 61.90%. This frequency was similar to that observed in Bamba-Kamagaté, Côte d'Ivoire (69.7%) [13]. However, it was the most frequent etiology of heart failure in sub-Saharan Africa (45.4% and 85.9%, respectively [7] [22]), as well as in the United States (65%) [20] and Europe (59%) [21]. In African Americans, hypertension was present in 96.1% of patients with diastolic dysfunction [23]. Upon admission to the ICA, ICFEP patients were mostly admitted for stage IV (50%) and stage III (40%) dyspnea according to the NYHA classification, as in a Moroccan study where heart failure patients were mostly admitted at stages III and IV (54%) [24].

More than half of our patients with HFpEF presented with global heart failure (52%), followed by left heart failure (39%), as reported by some authors in Africa [25] [26]. Global heart failure was the most frequent clinical manifestation; this could be due to late consultation, precarious living conditions, and insufficient or non-existent healthcare resources, which could explain this progression to severe forms [22].

The most common comorbidities were diabetes (7.33%), followed by coronary artery disease. Our results contradict those of other African studies [11] [13] [27]

[28]. The prevalence of diabetes in our study was 7.33%, while it was 44% in Nurcan [23], 45% in Mouhamed Cherif [11], and 21% in Shamagian [29].

Renal failure was the most frequent decompensation factor (4.40%), followed by pneumonia and anemia (2.56%). Our results are contrary to those of the THESUS-HF multicenter study, where the most frequently observed decompensation factors were poor treatment adherence, followed by bronchopulmonary infection [30].

The etiologies of HFpEF were dominated by hypertensive heart disease (58.61%). Our results are comparable to those of Traoré (85.6%) [7] and Bamba-Kamagaté (65.7%) [13] in Côte d'Ivoire. This could be related to the high prevalence of hypertension in our setting and its pathophysiological consequences, notably the development of left ventricular hypertrophy with increased arterial stiffness [31]. Ischemic heart disease was the second most frequent cause of HFpEF in our study (9.52%). This result is comparable to that of a Chinese study (29.3%) [32] and an American study (21%) [20]. Ischemic heart disease has also been found to be the second leading cause of HFpEF, although in a smaller proportion (4.6%) [7]. This higher proportion observed in our study could be explained by the increasing activity of interventional cardiology over the years at the ICA, allowing for more accurate diagnosis.

In paraclinical studies, radiological features were consistent with cardiomegaly in most of our patients (90%). These data do not agree with those of Bamba-Kamagate [13], where cardiomegaly was rare (23.6%) in HFpEF. This difference could probably be attributed to variations in the sample size of the studied population.

In our study, the electrocardiogram (ECG) revealed that patients with HFpEF presented, in decreasing order of frequency, with atrial fibrillation (AF) in 45.42% of cases, followed by left ventricular hypertrophy (LVH) in 28.94% of cases. In the literature, the prevalence of atrial fibrillation (or AF) in HFpEF was similar, at 20%, 30%, and 40%, respectively [10] [33] [34], while left ventricular hypertrophy (LVH) was described as the most frequent echocardiographic morphological abnormality [35].

Two-dimensional echocardiography was the paraclinical examination of choice to confirm the presence of heart failure with preserved ejection fraction (HFpEF). In our series, echocardiography revealed a preserved left ventricular ejection fraction (LVEF), with a mean of 58.3 ± 7.10%. The mean left ventricular end-diastolic diameter (LVEDD) was 48.15 ± 9.08 mm, which is consistent with data from the literature showing that, in HFpEF, left ventricular size remains normal for a prolonged period in the absence of associated factors, such as myocardial ischemia [26]. Left atrial dilation was uncommon in our series, observed in 0.73% of patients. These figures are significantly lower than those reported by Mboup [11], which were 75%. In general, the severity of dilation was correlated with the severity of diastolic dysfunction [17].

In biology, the level of NT-proBNP was high, with an average of 6077.9 + 833 pg/ml, which was also correlated with ICFEP [18].

Regarding therapeutic characteristics, unlike the treatment of heart failure with reduced ejection fraction (HFrEF), the treatment of heart failure with preserved ejection fraction (HFpEF) has remained largely empirical in clinical practice. Its main objective was to reduce signs of congestion and improve symptoms and quality of life [19]. Thus, the 2022 European Society of Cardiology guidelines for HFpEF remained well-structured and informative. Furosemide and beta-blockers were the standard treatment for heart failure; their use rates were 79.89% and 56.78%, respectively, in our series. In Hong Kong SAR, YI showed that only diuretic therapy (furosemide, thiazide) significantly improved symptoms and quality of life, while irbesartan or ramipril provided little benefit [32]. Dapagliflozin or empagliflozin reduced the combined risk of worsening heart failure and cardiovascular death in patients with preserved left ventricular ejection fraction, while also demonstrating a good safety profile [19]. They currently represent the only therapeutic class whose efficacy has been demonstrated [13].

In our series, only 2.2% of patients benefited from glifozine; this could be explained by the fact that our study began well before these recommendations.

In evolutionary characteristics, in our series, the average length of hospital stay was 6 days, similar to that observed by Goyal in the United States (more than 4 days) [14]. The one-year mortality rate was 9% in our study. Abebe, in Ethiopia, reported different figures, with a one-year mortality rate of 14.02% at the ICFEP [15]; however, this rate was higher in Canada (22.2%) and the United States (29%) [5]. This difference is likely due to variations in the size and characteristics of the study population sample. It is possible that the mortality rate was underestimated in our case because we did not account for deaths occurring before or after hospitalization, nor for those of patients lost to follow-up.

5. Conclusions

This study carried out at the Abidjan Cardiology Institute showed that ICFEP is an increasingly common entity in our context.

ICFEP occurred in elderly male subjects admitted at NYHA stage IV with global heart failure.

The comorbidities were primarily diabetes, coronary artery disease, renal failure, and atrial fibrillation.

The dominant etiology was arterial hypertension (HTA).

This is the ideal place to remind and raise public awareness about early screening and effective management of cardiovascular risk factors.

Conflicts of Interest

The authors declare that they have no conflict of interest.

References

[1] Ambrosy, A.P., Fonarow, G.C., Butler, J., Chioncel, O., Greene, S.J., Vaduganathan, M., *et al.* (2014) The Global Health and Economic Burden of Hospitalizations for

Heart Failure. *Journal of the American College of Cardiology*, **63**, 1123-1133. https://doi.org/10.1016/j.jacc.2013.11.053

[2] World Health Organization (2019) Cardiovascular Diseases. https://www.who.int/health-topics/cardiovascular-diseases

[3] Christian, A.M., Cajole, N.A., Carole Fadilath, Y., Latifa, B.B., *et al.* (2024) Clinical, Paraclinical, Therapeutic and Evolutionary Aspects of Acute Heart Failure in Libreville. *Health Sciences and Disease*, **25**, 31-35.

[4] González-Guerrero, J.L., Paredes-Galán, E., Ferrero-Martínez, A.I., Galán, M.C., Hornillos-Calvo, M., Menéndez-Colino, R., *et al.* (2020) Characteristics and One-Year Outcomes in Elderly Patients Hospitalized with Heart Failure and Reduced, Mid-Range, or Preserved Ejection Fraction. *Revista Española de Geriatría y Gerontología*, **55**, 195-200. https://doi.org/10.1016/j.regg.2019.12.001

[5] Galinier, M. (2008) Heart Failure with Preserved Ejection Fraction. *La Presse Médicale*, **37**, 1121-1131. https://doi.org/10.1016/j.lpm.2007.09.017

[6] Kingue, S., Dzudie, A., Menanga, A., Akono, M., Ouankou, M. and Muna, W. (2005) A New Perspective on Chronic Heart Failure in Adults in Africa in the Doppler Echocardiography Era: Experience of the Department of Medicine at Yaoundé General Hospital. *Annales de Cardiologie et d'Angéiologie*, **54**, 276-283. https://doi.org/10.1016/j.ancard.2005.04.014

[7] Traore, F., Bamba, K.D., Koffi, F., Ngoran, Y.N.K., Mottoh, M.P., Esaie, S., *et al.* (2017) Heart Failure with Preserved Ejection Fraction: A Report about 64 Cases Followed at the Heart Institute of Abidjan. *World Journal of Cardiovascular Diseases*, **7**, 285-291. https://doi.org/10.4236/wjcd.2017.79026

[8] Lejeune, S. and Pouleur, A.-C. (2022) Evaluation of Right Ventricular Function by Echocardiography and Its Prognostic Impact in Heart Failure with Preserved Circulatory Function: Current State and Perspectives. *VCP— Vaisseaux Cœur Poumon*, **27**, 12.

[9] Dunlay, S.M., Roger, V.L. and Redfield, M.M. (2017) Epidemiology of Heart Failure with Preserved Ejection Fraction. *Nature Reviews Cardiology*, **14**, 591-602. https://doi.org/10.1038/nrcardio.2017.65

[10] Isnard, R., Legrand, L. and Pousset, F. (2021) Heart Failure and Diabetes: Epidemiological Data, Phenotype, and Impact on Prognosis. *Metabolic Diseases Medicine*, **15**, 246-251. https://doi.org/10.1016/j.mmm.2021.02.009

[11] Mboup, M.C., Dia, K. and Fall, P.D. (2013) Heart Failure with Preserved Ejection Fraction in Sub-Saharan Africa: A Report of 32 Cases. *Pan African Medical Journal*, **16**, Article 100. https://doi.org/10.11604/pamj.2013.16.100.2323

[12] Adebayo, A.K., Adebiyi, A.A., Oladapo, O.O., Ogah, O.S., Aje, A., Ojji, D.B., *et al.* (2009) Characterisation of Heart Failure with Normal Ejection Fraction in a Tertiary Hospital in Nigeria. *BMC Cardiovascular Disorders*, **9**, Article No. 52. https://doi.org/10.1186/1471-2261-9-52

[13] Bamba-Kamagaté, Koffi, F., N'cho-Mottoh, M.P., Ehouman, E., Djamen, N.C.M. and Anzouan-Kacou, J.B. (2021) Comparative analysis of heart failure with reduced and preserved ejection fraction at the Cardiology Institute of Abidjan. *Tropical Cardiology*, **394**, Article 163. https://tropical-cardiology.com/Accueil/index.php/2013-08-10-06-44-55/annee-2021/n-163-jan-fev-mars-2021/394-analyse-comparative-de-l-insuffisance-cardiaque-alteree-et-preservee-a-l-institut-de-cardiologie-d-abidjan

[14] Magaña-Serrano, J.A., Almahmeed, W., Gomez, E., Al-Shamiri, M., Adgar, D., Sosner, P., *et al.* (2011) Prevalence of Heart Failure with Preserved Ejection Fraction in Latin American, Middle Eastern, and North African Regions in the I Prefer Study

(Identification of Patients with Heart Failure and Preserved Systolic Function: An Epidemiological Regional Study). *The American Journal of Cardiology*, **108**, 1289-1296. https://doi.org/10.1016/j.amjcard.2011.06.044

[15] Abebe, T.B., Gebreyohannes, E.A., Tefera, Y.G. and Abegaz, T.M. (2016) Patients with HFpEF and HFrEF Have Different Clinical Characteristics but Similar Prognosis: A Retrospective Cohort Study. *BMC Cardiovascular Disorders*, **16**, Article No. 232. https://doi.org/10.1186/s12872-016-0418-9

[16] Steinberg, B.A., Zhao, X., Heidenreich, P.A., Peterson, E.D., Bhatt, D.L., Cannon, C.P., *et al.* (2012) Trends in Patients Hospitalized with Heart Failure and Preserved Left Ventricular Ejection Fraction. *Circulation*, **126**, 65-75. https://doi.org/10.1161/circulationaha.111.080770

[17] Ho, J.E., Gona, P., Pencina, M.J., Tu, J.V., Austin, P.C., Vasan, R.S., *et al.* (2012) Discriminating Clinical Features of Heart Failure with Preserved vs. Reduced Ejection Fraction in the Community. *European Heart Journal*, **33**, 1734-1741. https://doi.org/10.1093/eurheartj/ehs070

[18] Pio, M., Afassinou, Y., Pessinaba, S., Baragou, S., N'djao, J., Atta, B., *et al.* (2014) Epidemiology and Etiologies of Heart Failure in Lomé. *Pan African Medical Journal*, **18**, Article 183.

[19] Massoure, P.L., Roche, N.C., Lamblin, G., Topin, F., Dehan, C., Kaiser, É., *et al.* (2013) Heart Failure Patterns in Djibouti: Epidemiologic Transition. *Médecine et Santé Tropicales*, **23**, 211-216. https://doi.org/10.1684/mst.2013.0188

[20] Masoudi, F.A., Havranek, E.P., Smith, G., Fish, R.H., Steiner, J.F., Ordin, D.L., *et al.* (2003) Gender, Age, and Heart Failure with Preserved Left Ventricular Systolic Function. *Journal of the American College of Cardiology*, **41**, 217-223. https://doi.org/10.1016/s0735-1097(02)02696-7

[21] Lenzen, M., Scholte op Reimer, W.J.M., Boersma, E., Vantrimpont, P.J.M.J., Follath, F., Swedberg, K., *et al.* (2004) Differences between Patients with a Preserved and a Depressed Left Ventricular Function: A Report from the Euroheart Failure Survey. *European Heart Journal*, **25**, 1214-1220. https://doi.org/10.1016/j.ehj.2004.06.006

[22] Ikama, M.S., Kimbally-Kaky, G., Gombet, T., Ellenga-Mbolla, B.F., Dilou-Bassemouka, L., Mongo-Ngamani, S., Ekoba, J. and Nkoua, J.L. (2008) Heart Failure in the Elderly in Brazzaville: Clinical, Etiological and Evolutionary Aspects. *Tropical Cardiology*, **68**, 257-260.

[23] Ilksoy, N., Hoffman, M., Moore, R.H., Easley, K. and Jacobson, T.A. (2006) Comparison of African-American Patients with Systolic Heart Failure versus Preserved Ejection Fraction. *The American Journal of Cardiology*, **98**, 806-808. https://doi.org/10.1016/j.amjcard.2006.03.066

[24] Kheyi, J., Benelmakki, A., Bouzelmat, H. and Chaib, A. (2016) Management of Heart Failure in a Moroccan Center. *Pan African Medical Journal*, **24**, Article 85. https://doi.org/10.11604/pamj.2016.24.85.8521

[25] Fofana, M., Toure, S., Dadhi, B.M., Sow, T., Yassima, C.A., Damby, B.O., *et al.* (1988) Etiological and Nosological Considerations Concerning 574 Cases of Heart Failure in Conakry. *Annales de Cardiologie et d'Angéiologie*, **37**, 419-424.

[26] Thiam, M. (2003) Heart Failure in an African Cardiological Context. *Bulletin of the Society of Exotic Pathology*, **96**, 217-218.

[27] Roux, E., Pieri, B., Bergeri, I., Jauffret, B., Villeneuve, L. and Arquès, S. (2003) Aggravating Factors Associated with Heart Failure with Preserved Systolic Function in Older Adults. *Annales de Cardiologie et d'Angéiologie*, **52**, 308-312. https://doi.org/10.1016/s0003-3928(03)00094-5

[28] Fatema, K., Hirono, O., Takeishi, Y., Nitobe, J., Kaneko, K., Ito, M., *et al.* (2002) Hemodialysis Improves Myocardial Interstitial Edema and Left Ventricular Diastolic Function in Patients with End-Stage Renal Disease: Noninvasive Assessment by Ultrasonic Tissue Characterization. *Heart and Vessels*, **16**, 227-231. https://doi.org/10.1007/s003800200029

[29] Shamagian, L.G., Roman, A.V., Garcia-Acuña, J.M., Ramos, P.M., Lamela, A.V. and Gonza-lez-Juanatey, J.R. (2005) Anaemia Is Associated with Higher Mortality among Patients with Heart Failure with Preserved Systolic Function. *Heart*, **92**, 780-784. https://doi.org/10.1136/hrt.2005.064394

[30] Damasceno, A., Mayosi, B.M., Sani, M., Ogah, O.S., Mondo, C., Ojji, D., *et al.* (2012) The Causes, Treatment, and Outcome of Acute Heart Failure in 1006 Africans from 9 Countries: Results of the Heart Failure Survey in Sub-Saharan Africa. *Archives of Internal Medicine*, **172**, 1386-1394. https://doi.org/10.1001/archinternmed.2012.3310

[31] Diamond, J.A. and Phillips, R.A. (2005) Hypertensive Heart Disease. *Hypertension Research*, **28**, 191-202. https://doi.org/10.1291/hypres.28.191

[32] Hai, J.J., Chan, P.H., Huang, D., Ho, M.H., Ho, C.W., Cheung, E., *et al.* (2016) Clinical Characteristics, Management, and Outcomes of Hospitalized Heart Failure in a Chinese Population. *Journal of Cardiac Failure*, **22**, 600-608. https://doi.org/10.1016/j.cardfail.2016.03.007

[33] Hogg, K., Swedberg, K. and McMurray, J. (2004) Heart Failure with Preserved Left Ventricular Systolic Function. *Journal of the American College of Cardiology*, **43**, 317-327. https://doi.org/10.1016/j.jacc.2003.07.046

[34] Cleland, J.G.F., Tendera, M., Adamus, J., Freemantle, N., Polonski, L., Taylor, J., *et al.* (2006) The Perindopril in Elderly People with Chronic Heart Failure (PEP-CHF) Study. *European Heart Journal*, **27**, 2338-2345. https://doi.org/10.1093/eurheartj/ehl250

[35] Berry, C., Hogg, K., Norrie, J., Stevenson, K., Brett, M. and McMurray, J. (2005) Heart Failure with Preserved Left Ventricular Systolic Function: A Hospital Cohort Study. *Heart*, **91**, 907-913. https://doi.org/10.1136/hrt.2004.041996