



Research Article

Death prognosis factors of chronic heart failure in the elderly in Burkina Faso

Yaméogo NV^{1-3*}, Kagambèga LJ^{1,2}, Sib JDE¹,
Tall Thiam A^{1,3}, Koudougou KJ^{1,2}, Millogo GRC^{1,3},
Samadoulougou AK^{1,3}, Simporé J⁴ and Zabsonré P^{1,3}

¹Department of Cardiology, Yalgado Ouédraogo University Hospital, 03 BP 7022, Ouagadougou 03, Burkina Faso

²Cardiology, Unit of Saint Camille Hospital of Ouagadougou, 09 BP 444, Ouagadougou 09, Burkina Faso

³Doctoral School in Health Sciences, Joseph KI-ZERBO University, 03 BP 7021, Ouagadougou, Burkina Faso

⁴Biomolecular Laboratory of Saint Camille Hospital of Ouagadougou, 09 BP 444 Ouagadougou 09, Burkina Faso

Received: 23 December, 2021

Accepted: 04 January, 2022

Published: 05 January, 2022

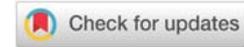
*Corresponding author: Yameogo Nobila Valentin, Department of Cardiology, Yalgado Ouédraogo University Hospital, 03 BP 7022, Ouagadougou 03, Burkina Faso, Tel: +226 72161665; E-mail: nobilavalentin@gmail.com, drnova@hotmail.fr

Keywords: Heart failure; Elderly; Sub-Saharan Africa; Death; Prognosis factors

Copyright License: © 2022 Yaméogo NV, et al.

This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

<https://www.peertechz.com>



Abstract

Background: Heart failure is the main reason for hospitalization in the cardiology department of Yalgado Ouédraogo University Hospital. The main causes of heart failure are arterial hypertension and myocardial ischemia. Mortality is high during hospitalization and can reach 48%. The follow-up of patients after hospitalization is difficult with many lost to follow-up. The medium and long term prognosis of chronic heart failure is not known in our country.

Objective: Identify death prognosis factors of heart failure in elderly subjects aged at least 60 years old.

Patients and Method: We conducted a retrospective, cross-sectional study that consisted of systematic inclusion from hospitalization registers of patients of both sexes aged at least 60 years, hospitalized in the cardiology department CHU Yalgado Ouédraogo from January 1 to December 31, 2016. We assessed the type of heart failure, electrocardiographic and echocardiographic parameters, comorbidities, etiologies of heart failure as well as the intra-hospital evolution during this hospitalization until discharge. After including these patients, they were called to participate in the study (which ran from December 1 to 31, 2020) by giving informed consent. We collected follow-up data (since discharge from the first hospitalization, i.e., one consultation each month for at least 42 months) from the patients' individual follow-up diaries (rehospitalization, improvement, therapeutic compliance). We then performed a complete clinical examination, an electrocardiogram, a cardiac echography, and a biological workup including blood count, creatinine level, liver function tests, blood glucose and blood ionogram.

Results: We included 87 elderly subjects representing 53.05% of all patients received for chronic heart failure in the cardiology department in 2016.

The mean age was 71.49 ± 8.46 years and the sex ratio was 2. High blood pressure was the main cardiovascular risk factor in 62.07% of cases. In-hospital mortality was 20.69%, and factors associated with it included male sex (OR= 11.60 $p < 0.01$), renal dysfunction on admission (OR= 1.30 $p = 0.03$), and cardiogenic shock developed during hospitalization (OR= 10.30 $p < 0.01$). Mortality at approximately 4 years was 67.47% with a mean time to death of 13.60 months. No independent factor was found to predict death after discharge.

Conclusion: The prognosis of heart failure in the elderly is poor in our context. The in-hospital death prognosis factors are renal dysfunction, cardiogenic shock, An early and adapted management of this age group will improve survival.

Introduction

Heart Failure (HF), a progressive term for most heart diseases, has been designated as an emerging epidemic worldwide since 1997 [1]. Its prevalence increases progressively with age, affecting 0.7% of people between 45 and 54 years of age and 8.4% of people older than 75 years [2]. Mortality data from the major trials - CONSENSUS, SOLVD, SAVE, and RALES - clearly show that despite therapeutic advances, CI is still associated with high mortality. It is the leading cause of morbidity, mortality and hospitalization in populations over 65 years of age [3]. In addition, there is a lack of evidence-based therapies for this population as they are underrepresented in clinical trials [3]. The assessment of its prognosis is therefore essential for adequate patient management. Indeed, the best possible assessment of the risk profile will determine the rational use of available therapeutic resources.

Methodology

We conducted a retrospective, cross-sectional study that consisted of systematic inclusion from hospitalization registers of patients of both sexes aged at least 60 years, hospitalized in the cardiology department CHU Yalgado Ouédraogo from January 1 to December 31, 2016. We assessed the type of heart failure, electrocardiographic and echocardiographic parameters, comorbidities, etiologies of heart failure as well as the intra-hospital evolution during this hospitalization until discharge. After including these patients, they were called to participate in the study (which ran from December 1 to 31, 2020) by giving informed consent. We collected follow-up data (since discharge from the first hospitalization, i.e., one consultation each month for at least 42 months) from the patients' individual follow-up diaries (rehospitalization, improvement, therapeutic compliance). We then performed a complete clinical examination, an electrocardiogram, a cardiac echography, and a biological workup including blood count, creatinine level, liver function tests, blood glucose and blood ionogram.

The studied variables were

- Sociodemographic data: age, sex, origin.
- Cardiovascular risk factors: hypertension, diabetes, smoking, dyslipidemia, obesity.
- Clinical data: type of heart failure: right, left, or global
- Paraclinical parameters:

Electrocardiographic data: The presence of rhythm disorders, conduction disorders, left atrial hypertrophy and left ventricular hypertrophy.

Echocardiographic data: Left ventricular ejection fraction, left ventricular end-diastolic diameter, left ventricular end-systolic diameter, interventricular septal thickness (IVS), Posterior Wall Thickness (PWT), left atrial diameter, right ventricular systolic function (TAPSE), Pulmonary Arterial Systolic Pressure (PASP), presence of thrombus or intra-cavity contrast, valvular damage, disturbance of LV kinetics;

Biological data: Lipid balance, blood sugar, creatinine, natremia, kalemia, calcemia, magnesemia, uric acid, hemoglobin level

- Complications during hospitalization: Rhythm troubles, conduction troubles, cardiogenic shock, septic shock, collapse and death.
- etiologies of heart failure: hypertensive, ischemic, deficiency, valvular heart disease, cardiomyopathy, myocarditis, restrictive heart disease, idiopathic dilated cardiomyopathy, infective endocarditis, pericarditis.
- Decompensation factors: non-compliance with therapy, heart rhythm trouble, intercurrent infection, anemia, hydro electrolytic disorders.
- Treatments at discharge: diuretics, angiotensin-converting enzyme inhibitors, beta-blockers, spironolactone, calcium channel blockers, digoxin, amiodarone, platelet aggregation inhibitors, statins, vitamin K inhibitors
- The evolution after hospital discharge: rehospitalization (number and indication), decompensation episode, death.
- Clinical and paraclinical data at T+1: signs of heart failure, electrocardiographic and echocardiographic parameters, glomerular filtration rate.

Collected data were analyzed by the 7 versions of Epi Info software.

Categorical variables were expressed as percentages and continuous variables as means \pm standard deviation. Comparison of data was done using the Chi-square, Fisher, or Student test as appropriate. The univariate and multivariate analysis of factors associated with death within the hospital and after surgery was performed using the logistic regression model. $p < 0.05$ was considered as statistically significant. Survival analysis was performed using the Kaplan-Meier curve.

The protocol has been submitted to the local ethics committee.

Results

During the inclusion period (the year 2016), 405 subjects, including 164 for heart failure, were admitted to the cardiology department, representing a hospitalization rate of 40.49%. Elderly subjects represented 53.05% (87) of all patients received for heart failure.

The mean age was 71.49 ± 8.46 years [60-100] and the sex ratio was 2. High blood pressure was the main cardiovascular risk factor in 62.07% of cases. Rhythm trouble was present in 44.83% and the mean LVEF was $44.43 \pm 15.34\%$ [19-85]. The general characteristics of the subjects are presented in Table 1.

In-hospital mortality was 20.69% (18 cases). Compared with surviving patients in terms of sociodemographic,



clinical, electrocardiographic, biological, and left and right ventricular function characteristics, patients who died during hospitalization had a higher percentage of males (41.46% H deceased vs. 3.57 F, $p < 0.01$), higher plasma creatinine level (152.69 $\mu\text{mol/l}$ vs. 119.65 $\mu\text{mol/l}$, $p = 0.04$), presented more cardiogenic shock during hospitalization (7 vs. 4, $p < 0.01$).

Logistic regression analysis revealed that male sex (OR= 11.60 95% CI 1.46 to 92.30 $p < 0.01$), high plasma creatinine level on admission (OR= 1.30 95% CI 1.1 to 2.4 $p = 0.03$), and development of cardiogenic shock during hospitalization (OR= 10.30 95% CI 2.23 to 47.30 $p < 0.01$) were the independent factors for in-hospital mortality Table 2.

After a period of at least 42 months after the first hospitalization in 2016, subjects or their families were contacted by telephone. Of the 69 subjects placed on exeat, 8 or 11.59% could not be reached. The families contacted reported 42 deaths or 67.47%. The mean time to death at least 42 months after was 13.60 ± 10.80 months [1-49]. No independent factors for mortality after at least 42 min were identified (Table 3).

Figure 1 shows the Kaplan–Meier survival curve.

Discussion

The average age of the subjects was 71.49 years. Ikama, et al. [4] in Brazzaville and Barry, et al. [5] in Conakry found respectively an average age of 70.40 and 75.32 years. These average ages correspond to those of the European series. Indeed, they report that the age group over 70 years represents the most affected by HF [2]. The sex ratio was 2. Our series noted an 11-fold greater risk of death in men than in women.

Table 1: General characteristics of 87 aged patients, suffering from chronic heart failure.

Caractéristiques	Number	Percentage
Number	87	100
Sex-ratio 58m/29w = 2		
Mean age 71.49 \pm 8,46 year old [60-100]		
Hypertension	54	62.07
Known history of heart disease	30	34.48
alcohol consumption	14	16.09
Active smoking	11	12.64
Obesity	12	13.79
Diabetes	14	16.09
Dyslipidemia	2	2.30
History stroke	5	5.77
History of acute coronary syndrome	1	1.15
chronic kidney disease	3	3.45
Left heart failure	51	58.62
Arrhythmias	39	44.83
Mean left ventricular ejection fraction = 44.43 \pm 15.34 [19-85]		
Reduced Left Ventricular Ejection Fraction	39	44.83
Preserved Left Ventricular Ejection Fraction	32	36.78
Pulmonary artery Hypertension	62	79.49

Table 2: Factors associated with death during hospitalization in univariate and multivariate analysis in young subjects.

Variables	Univariate analysis		Multivariate analysis	
	OR (IC : 95%)	P	OR (IC: 95%)	p
Heart rhythm trouble at admission	2.31[0.58-9.27]	0.25	-	-
Cardiogenic shok at admission	3.94[0.62-25.04]	0.17	-	-
Cardiogenic shok during hospitalization	8.57[1.98-37.13]	<0.01	7.73[1.54-38.71]	0.01
Threatening hyperkalemia	17.71[1.42-221.16]	0.04	8.80[0.52-148.44]	0.13
renal insufficiency at admission	1.95[0.13-2.23]	0.47	-	-
Left ventricular ejection fraction < 40%	0.77 [0.20-2.97]	0.75	-	-
TAPSE < 15 mm	1.11 [0.16-7.63]	1	-	-
Pulmonary systolic arterial pressure > 30 mm Hg	1.5 [0.26-8.55]	0.64	-	-
Presence of intra-cavity thrombus	Not defined	0.58	-	-

Table 3: Factors associated with death during the 4 years after surgery in univariate analysis in elderly subjects.

Variables	Univariate analysis	
	OR (IC: 95%)	P
Left ventricular ejection fraction < 40%	3 [0.92-9.75]	0.09
Vitamin K antagonist use	0.50 [0.16-1.64]	0.35
Beta Blokers use	0.39 [0.11-1.41]	0.18
Heart rhythm trouble	0.75[0.17-3.19]	0.50
TAPSE < 15 mm	4.17 [0.85-20.44]	0.14
Pulmonary systolic arterial pressure > 30 mm Hg	0.31 [0.08-1.23]	0.15
Presence of intra-cavity thrombus	0.95 [0.08-11.14]	1

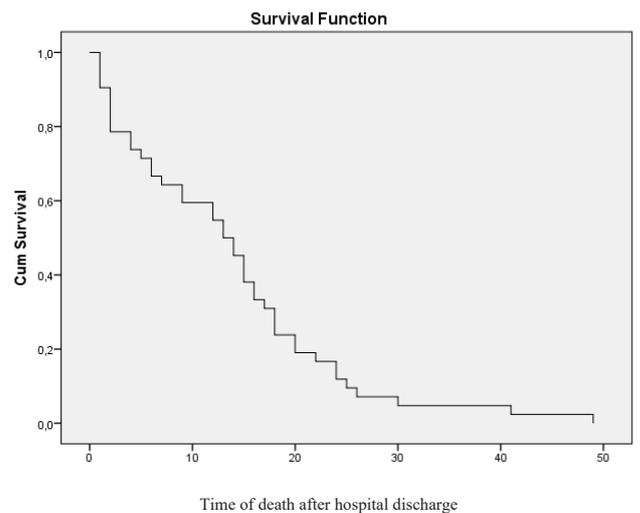


Figure 1: Kaplan Meier analysis of survival data. It shows the survival curve of elderly subjects with heart failure. Survival curve for patients discharged from hospital.

The more frequent exposure of men to certain cardiovascular risk factors (tobacco and alcohol) as well as the conception of health by African populations (where women have easier access to the health center) could explain this finding.

High blood pressure was the main cardiovascular risk factor. Thiam [6] in Senegal and Dokainish, et al. [7] made the same observation regarding hypertension as the main cardiovascular risk factor. The epidemiological transition in sub-Saharan African countries explains the high prevalence

of hypertension in these populations. However, there was no correlation between the history of hypertension and risk of death in our series.

An arrhythmia was present in 44.83% and AF was the primary one. Barry, et al. [5] also found atrial fibrillation as the main arrhythmia. The increased necrosis and apoptosis in the elderly explain the high prevalence of RDR in this age group. LVEF was preserved in 36.78% of cases. The literature reports a higher frequency of preserved LVEF in elderly subjects. LVEF is one of the prognostic factors known for a long time. Indeed, different African and European series have reported a poor prognosis in cases of severe LVEF impairment [8,9].

The in-hospital mortality was 20.69%. Barry, et al. [5] and Ikama, et al. [4] reported similar rates of 17.59% and 20.20% respectively. The in-hospital mortality rate in this age group is higher than in the general population where African series show a rate of about 10% [9,10]. The presence of renal dysfunction on admission and the occurrence of cardiogenic shock during hospitalization gave a risk of in-hospital death 1.30 and 10.30 times greater respectively. These factors are consistent with those found in the various studies on the factors of CI. In addition, in these series, factors such as old age, high NT-proBNP level, hyponatremia, and a cardiothoracic index higher than 0.7 were found [9-11].

The mortality rate at 42 months was 67.47%. This rate is probably underestimated because of the lost to follow-up. But it gives us valuable information about the severity of long-term HF in the elderly.

Conclusion

Heart failure in the elderly has a high in-hospital mortality. Its evolution in this age group is marked by the death of more than half of the subjects after 4 years. The prognostic factors found in our study are related to the delay in consultation and management of cases. Education of the population to avoid cardiovascular risk factors, as well as early and appropriate management, will probably reduce this mortality.

Acknowledgments

We would like to thank the staff of the different collection sites for their collaboration.

References

1. Braunwald E (1997) Shattuck lecture--cardiovascular medicine at the turn of the millennium: triumphs, concerns, and opportunities. *N Engl J Med* 337: 1360-1369. [Link: https://bit.ly/3zp3K4p](https://bit.ly/3zp3K4p)
2. Mosterd A, Hoes AW (2007) Clinical epidemiology of heart failure. *Heart* 93: 1137-1146. [Link: https://bit.ly/3zmDc3V](https://bit.ly/3zmDc3V)
3. Cvetinovic N, Loncar G, Farkas J (2016) Heart failure management in the elderly - a public health challenge. *Wien Klin Wochenschr* 128: 466-473. [Link: https://bit.ly/3sT4opw](https://bit.ly/3sT4opw)
4. Ikama MS, Kaky GS, TR G, Ellenga-Mbolla B, Dilou-Bassemouka L, et al. (2008) Insuffisance cardiaque du sujet âgé à Brazzaville : aspect cliniques, étiologiques et évolutifs. *Médecine tropicale: revue du Corps de santé colonial*. 68: 257-260. [Link: https://bit.ly/3JGAzPa](https://bit.ly/3JGAzPa)

5. Barry IS, Balde MD, Balde AS, Balde EY, Sylla IS, et al. (2017) Insuffisance cardiaque du sujet âgé : Aspects épidémiologiques, cliniques, thérapeutiques, et évolutifs dans le Service de Cardiologie de l'Hôpital National Ignace Deen. *Cardiologie Tropicale*. [Link: https://bit.ly/32GjEM3](https://bit.ly/32GjEM3)
6. Thiam M (2003) Insuffisance cardiaque en milieu cardiologique africain. *Bull Soc Patho Exot* 96: 217-218. [Link: https://bit.ly/3sRSWus](https://bit.ly/3sRSWus)
7. Dokainish H, Teo K, Zhu J, Roy A, AlHabib KF, et al. (2016) Heart Failure in Africa, Asia, the Middle East and South America: The INTER-CHF study. *Int J Cardiol* 204: 133-141. [Link: https://bit.ly/3HsSBCK](https://bit.ly/3HsSBCK)
8. Authors/Task Force Members, Steg C, James SK, Atar D, Badano LP, Lundqvist CB, et al. (2012) ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. *European Heart Journal* 33: 2569-2619. [Link: https://bit.ly/3qKwcdc](https://bit.ly/3qKwcdc)
9. Bivigou EA, Allognon MC, Ndoume F, Mipinda JB, Nzengue EE (2018) Létalité de l'insuffisance cardiaque au Centre Hospitalier Universitaire de Libreville (CHUL) et facteurs associés. *Pan Afr Med J* 31: 27. [Link: https://bit.ly/3qG6qGW](https://bit.ly/3qG6qGW)
10. Zoghi M, Duygu H, Güngör H, Nalbantgil S, Yilmaz GM, et al. (2008) The determination of the factors impacting on in-hospital mortality in patients with acute heart failure in a tertiary referral center. *Anadolu Kardiyol Derg* 8: 255-259. [Link: https://bit.ly/3FScsXN](https://bit.ly/3FScsXN)
11. Villalba NL, Ballesteros BC, Álvarez LDP, Mainar PD, Sánchez AN, et al. (2019) Facteurs de prédiction de réadmission précoce et mortalité dans l'insuffisance cardiaque dans le Service de Médecine Interne de l'Hôpital Universitaire San Carlos, Espagne. *Pan Afr Med J* 34: 202. [Link: https://bit.ly/3t0L6il](https://bit.ly/3t0L6il)

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds' renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services (<https://www.peertechz.com/submission>).

Peertechz journals wishes everlasting success in your every endeavours.