Scientific Research Publishing

Open Journal of Epidemiology, 2025, 15(2), 321-334
https://www.scirp.org/journal/ojepi
ISSN Online: 2165-7467
ISSN Print: 2165-7459

Atrial Fibrillation in Heart Failure Patients in the Cardiology Department of Ignace Deen University Hospital: Epidemiological, Clinical and Therapeutic Aspects

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How to cite this paper: Baldé, E.Y., Bah, M.B., Barry, I.S., Diallo, M.M., Doumbouya, A.D., Koné, A., Sylla, I.S., Aliou, B., Bah, M.D., Diakité, S. and Baldé, M.D. (2025) Atrial Fibrillation in Heart Failure Patients in the Cardiology Department of Ignace Deen University Hospital: Epidemiological, Clinical and Therapeutic Aspects. *Open Journal of Epidemiology*, **15**, 321-334.
https://doi.org/10.4236/ojepi.2025.152020

Received: January 6, 2025
Accepted: May 3, 2025
Published: May 6, 2025

Abstract

Introduction: Atrial fibrillation (AF) and heart failure (HF) are increasingly common cardiovascular diseases. They often occur together or lead to mutual complications. Patients with both conditions are at particular risk of cardiovascular complications, including all-cause death, cardiovascular death, stroke and worsening heart failure. **Patients and Methods:** A prospective, cross-sectional, descriptive study conducted over six months, from 1 April 2024 to 30 September 2024. All patients hospitalised in the department for heart failure and atrial fibrillation were eligible for the study. Sociodemographic, clinical, paraclinical and therapeutic data were collected. **Results:** Of the 372 patients included, 26.34% had AF, often associated with rheumatic valve disease. The mean age was 56.47 years, with females predominating. Therapeutic strategies focused on controlling heart rate, with extensive use of beta-blockers. Direct oral anticoagulants (DOACs) were the treatment of choice for thromboembolic prevention, despite access constraints. **Conclusion:** The high prevalence of AF in a relatively young population with little education highlights the need for prevention and early detection programmes targeting at-risk populations.

Keywords

Atrial Fibrillation, Heart Failure, Cardiology, Ignace Deen

1. Introduction

Atrial fibrillation (AF) is a supraventricular tachyarrhythmia with uncoordinated atrial electrical activation and consequent ineffective atrial contraction [1]. By substituting disordered electrical activity for regular sinus pulses, AF has haemodynamic consequences, with a loss of atrial contribution to cardiac output and an increased risk of thromboembolic events [2]. It can be complicated by stroke and heart failure [3].

AF and HF share common pathophysiological features (4). The association of AF and CHF is explained by common risk factors such as age, arterial hypertension (AH), diabetes, obesity, as well as valvular, ischaemic or hypertrophic heart disease, and even hyperthyroidism [4]. Its management focuses on thromboembolic prevention, ventricular rate control, maintenance of sinus rhythm and management of risk factors and co-morbidities [5]. Epidemiologically, AF is the most common cardiac arrhythmia, affecting 1 to 2% of the general population [6]. It is the most common sustained arrhythmia in heart failure, with an average prevalence of 25% [7]. CHF and AF have emerged as two new epidemics of cardiovascular disease over the last 20 years. The prevalence of both conditions is expected to increase as the population ages. By 2030, there will be 12 million Americans with AF and more than 8 million with IC [8].

The results of the NATURE HF registry show that among the 2040 heart failure patients, 337 with an average age of 65 ± 13 years had AF (16.5%) [9].

In sub-Saharan Africa, a major cause of AF is rheumatic disease [10].

The VALVAFRIC study carried out in 7 countries in West and Central Africa found that 22% of the 3441 patients with rheumatic valve disease had AF [11].

In Senegal in 2023, AFFANGLA DA found 47.76% heart failure in patients suffering from atrial fibrillation [12].

The aim of this study was to investigate the sociodemographic, diagnostic and therapeutic aspects of AF in patients hospitalised for IC in the cardiology department of the Ignace Deen University Hospital.

2. Patients and Methods

2.1. Scope of the Study

This study was carried out in the Republic of Guinea, a country in West Africa. The cardiology department of the Ignace Deen University Hospital was the setting for the study.

2.2. Type and Duration of Study

This was a prospective cross-sectional descriptive study, lasting six months from 1 April to 30 September 2024.

2.3. Characteristics of the Population Studied

- Inclusion criteria

This study focused on heart failure patients with atrial fibrillation. All included

patients had at least a 12-lead ECG and/or Holter ECG and transthoracic echocardiography.

- **Non-inclusion criteria**

All patients admitted or hospitalised for heart failure in whom atrial fibrillation has not been diagnosed and all other cases of atrial fibrillation not associated with heart failure.

2.4. Variables

The variables studied were as follows:

a) Sociodemographic: age, gender, level of education.

b) Clinical: included history, cardiovascular risk factors, reasons for consultation, NYAH stages, mean heart rate, etc...

c) Paraclinical:

- ECG and Holter ECG: used to diagnose AF, measure heart rate and identify other associated abnormalities (LVH, LAH, RVH, RAH, electrical signs of ischaemic heart disease, bundle branch block).
- Cardiac Doppler ultrasonography was used to search for structural and functional cardiac abnormalities and to assess the cardiac repercussions of AF, such as: left ventricular hypertrophy, left ventricular dilatation, left atrial dilatation, systolic and diastolic dysfunction, segmental kinetic disorders, valvulopathies and assessment of the left ventricular ejection fraction.

d) Therapeutics: includes the medicinal treatments used: Anticoagulants (VKA, DOAC, LMWH), platelet anti-aggregants, Antiarrhythmics (bisoprolol, digoxin and amiodarone), ACE inhibitors, ARBs, diuretics and positive inotropes).

2.5. Data Management and Analysis

Our data was collected using a pre-established survey form on the Kobocollect application. The data were analysed using SPSS software and presented using Microsoft 365.

2.6. Confidentiality

The data was collected anonymously and confidentiality was respected.

3. Results

During the study period, 372 patients were hospitalised for heart failure, 98 of whom had atrial fibrillation, a rate of 26.3%. The mean age of the patients was 56.47 ± 20.37 years. The 60 - 74 age group was the most represented (30.6%). The majority of patients were female (59%) with a sex ratio M/F of 0.6. The majority of our patients had a primary school education (57.1%) (Table 1). Age (53.1%) and arterial hypertension (44.9%) were the risk factors most frequently encountered in our study. A history of heart disease and atrial fibrillation were found in 36.7% and 30.6% respectively (Table 2).

Dyspnoea was the main reason for consultation (85.7%), followed by palpita-

tions (63.7%). NYHA class III was the most common (42.8%) (Table 3). ECG abnormalities were dominated by left ventricular hypertrophy (38.7% of cases). The mean ventricular rate was 116 bpm ± 30.24 with extremes of 100 and 165. Permanent AF was predominant in 70% of our patients, persistent AF in 26% and paroxysmal AF in 4% (Table 4). Dilatation of the left ear was predominant on TTE, accounting for 79.6% of cases. Underlying heart disease was dominated by rheumatic valve disease (48.9%), followed by hypertensive heart disease (22.4%) (Table 5). The strategy of frequency control was the main objective in all our patients, beta-blockers were used in 81.6% of our patients followed by Digoxin in 29.5% of cases. Direct oral anticoagulants (DOACs) were used in 48% of our patients. Furosemide was prescribed in 94 patients (96%), Aldactone in 71%, ACE inhibitors in 57%, and inotropes and ARAII in 2% each (Table 6).

Table 1. Socio-demographic characteristics.

Variables		Number (N= 98)	Percentage (%)
Age groups			
15 - 29		12	12.2
30 - 44		20	20.4
45 - 59		14	14.2
60 - 74		**30**	**30.6**
>74		22	22.4
Gender			
Female		59	59.6
Male		40	40.4
Level of education			
Unschooled		24	24.4
	Primary	**56**	**57.1**
Schooled	Secondary	10	10.2
	Superior	8	8.1

Table 2. Antecedents and cardiovascular risk factors.

Variables	Number (N = 98)	Percentage (%)
History		
Heart disease	36	36.7
Atrial fibrillation	30	30.6
Diabetes	12	12.2
Stroke	6	6.1

Continued

Dysthyroidism	2	2.0
Kidney disease	2	2.0
Cardiovascular risk factors		
AGE	**52**	**53.1**
Hypertension	**44**	**44.9**
TOBACCO	4	4.1
Diabetes	14	14.3
Obesity/Overweight	6	6.1

Table 3. Reasons for consultation and NYHA classification.

Variables	Number (N = 98)	Percentage (%)
Reasons for consultation		
Dyspnoea	**84**	**85.7**
Palpitations	66	67.3
lower limb edema	44	44.9
Asthenia	42	42.9
Chest pain	18	18.4
Other	12	12.2
Neurological deficit	8	8.1
Fever	6	6.1
NYHA classification		
Class I	8	8.1
Class II	30	30.6
Class III	**42**	**42.8**
Class IV	14	14.3

Other: Cough, Tinnitus, epigastralgia, dizziness.

Table 4. Electrical abnormalities associated with the ECG.

Variables	Number (N = 98)	Percentage (%)
Electrical abnormalities associated with the ECG		
Atrial flutter	4	4.1
* LAH	20	20.4
* RAH	4	4.1
* LVH	**38**	**38.7**

Continued

* RVH	12	12.2
Necrosis Q wave	6	6.1
Wide QRS	4	4.1
Permanent AF	69	70.4
Persistent	F	26.5
Paroxysmal AF	4	4.1
	AHR	
100 - 120	10	10.2
>120	**88**	**89.8**
Mean HR was 116 bpm ± 30.24 with extremes of 100 and 165		

LAH: Left atrial hypertrophy, RAH: right atrial hypertrophy, LVH: left ventricular hypertrophy, RVH: right ventricular hypertrophy. **AHR**: average heart rate.

Table 5. Structural and functional abnormalities on TTE and according to underlying heart disease.

Variables	Number (N = 98)	Percentage (%)
Structural and functional abnormalities		
LV diastolic dysfunction	40	40.8
Dilatation of the LA	**78**	**79.6**
Dilatation of the RA	38	38.8
Dilatation of the LV	42	42.8
Hypertension artérielle pulmonaire	20	20.4
Dilation of the RV	24	24.4
Disturbance in LV segmental kinetics	12	12.2
Valvular defects	48	48.9
Mitral narrowing	24	28.5
Mitral insufficiency	16	16.3
Aortic insufficiency	4	4.1
Intracavitary thrombus	4	4.1
LVEF preserved	50	51.0
Reduced LVEF	38	38.7
Moderately reduced LVEF	10	10.2
Underlying heart disease		
Hypertensive heart disease	36	36.7
Ischaemic heart disease	6	6.1

Continued

Dilated cardiomyopathy	10	10.2
Valvular pathologies	**48**	**48.9**
Pericarditis	2	2.0

Table 6. Support.

Variables	Number (N = 98)	Percentage (%)
Antithrombotics		
Direct oral anticoagulants	**48**	**48.9**
Anti-vitamin K	40	40.8
Antiplatelet agents	16	16.3
Low molecular weight heparin	20	20.4
Anti-arrhythmic		
Amiodarone	6	6.1
Beta-blockers	**80**	**81.6**
Digoxine	29	29.5
Treatment of heart failure		
Furosemide	**94**	**95.9**
Spironolactone	70	71.4
ARAII	2	2.0
CEI	56	57.1
Beta-blocker	80	81.6
Dobutamine	2	2.0

4. Discussion

AF and heart failure have a complex, bidirectional relationship. AF aggravates heart failure, leading to a significant increase in symptoms, hospitalisations and cardiovascular mortality. These two conditions, which are constantly on the increase due to the ageing of the population, represent a major public health issue [13]. Both conditions have become epidemics of the 21st century, and prevalence continues to rise as a result of increased longevity and the successful reduction of cardiovascular (CV) mortality, significantly increasing the cost of treatment for healthcare systems worldwide [13].

Our study of 98 patients at Ignace Deen University Hospital illustrates this reality. However, the constraints associated with an unfavourable socio-economic context, such as limited access to certain complementary examinations, limited our study. Despite these constraints, our results highlight the importance of this issue.

During our survey period, 372 patients were admitted to the department for heart failure, 98 of whom had atrial fibrillation, a frequency of 26.34%. This proportion is lower than the results reported in other studies, such as those by DIOP KR *et al.* [3] (66%) or Parag Goyal *et al.* [14] (40%). In the Framingham Heart Study, AF occurred in more than half of people with CHF, and CHF occurred in more than a third of people with AF [15]. This difference with our study could be explained by the difference in sample size, the study conditions and the means used to screen for AF in IC patients. It should be remembered that in Guinea AF is under-diagnosed, paroxysmal or asymptomatic AF is often unrecognised because only symptomatic and severe forms are referred to cardiology.

The mean age of our patients (56.47 years) was comparable to that reported in other African studies by SANGARE I *et al.* [16] and DIOP KR *et al.* [3], but lower than the average observed in western countries (70 - 80 years). This difference could be explained by the higher prevalence of rheumatic valve disease in sub-Saharan Africa, which often affects younger populations [17]. Nevertheless, our results suggest a trend towards an increase in the mean age of patients with atrial fibrillation in Africa.

Our study revealed a predominance of females (59%), a result in agreement with the work of DIOP KR *et al.* [3] and SANGARE I *et al.* [16]. However, Samoura Aly *et al.* [18] reported a male predominance in their study of hypertensive patients. With regard to level of education, our results, similar to those of DIOP KR *et al.* [3], show a majority of patients with primary education. Age and hypertension were the main risk factors identified in our study (53.1% and 42.9%), in line with the literature [19] [20]. A history of heart disease (36.7%) and diabetes (14.3%) were also common. These results confirm the importance of hypertension, diabetes, cardiovascular disease and age in the development of atrial fibrillation, as highlighted in previous studies [19] [20]. The main reasons for consultation in our study were dyspnoea (85.7%), palpitations (67.3%) and oedema of the lower limbs (44.9%). These results are comparable to those reported by DIOP KR *et al.* [3] and SANGARE I *et al.* [16], where heart failure was the most frequent reason for consultation. These results could be explained by the fact that dyspnoea, a frequent symptom of heart failure, is often the main reason why patients consult their doctor.

With regard to NYHA classification, stage III was the most frequent in our cohort (42.8%), a result similar to that reported by Camara A *et al.* [21]. However, unlike that study, stage II was the second most common stage in our patients (30.6%). The difference in the study population could explain this result. The predominance of stage III suggests that our patients consult specialist facilities late.

We observed a predominance of permanent atrial fibrillation (70%) in our patients, followed by persistent AF (26%) and paroxysmal AF (4%). This distribution is in line with data from the African literature, where permanent AF is more frequently reported [3]. This difference can be explained by the high prevalence of valvular heart disease in sub-Saharan Africa and by later diagnosis, which favours progression to more chronic forms of AF.

Echocardiography revealed left atrial dilatation in 76.6% of our patients, a rate comparable to those reported by SANGARE I *et al.* [16] (42.31%) and Samoura A *et al.* [18] (95.92%). (20) and Samoura A *et al.* [18] (95.92%) (This association between AF and left atrial dilatation is well known. We also observed left (42.8%) and right (38.8%) ventricular dilatation, which could be explained by the prevalence of valvulopathy in our population.

We observed that 51% of cases had preserved LVEF. SANGARE I *et al.* [16] described left ventricular (LV) systolic dysfunction in 36.54% of cases. Studies in Korea and Sweden have shown that the prevalence of AF increases significantly in heart failure patients with preserved LVEF [15], which could be explained by earlier detection and the ageing of the population in these regions. Furthermore, LVEF may remain preserved for a long time in patients with valvular heart disease, which could partly explain our results.

The predominance of rheumatic valve disease (48.97%) among the causes of atrial fibrillation (AF) in our cohort is characteristic of sub-Saharan African populations [3] [16], where sequelae of rheumatic fever are still common. This observation contrasts with data from the international literature, where ischaemic heart disease and arterial hypertension are more often associated with AF [15]. These differences can be explained by socio-economic factors, lifestyle habits and variable access to healthcare in different regions.

Our study favoured a strategy of heart rate control in all patients, with the majority using beta-blockers (81.6%). This approach is in line with international recommendations [22] [23] and current practice in Africa, as shown by the work of DIOP KR *et al.* [3] (78%) (3) and SANGARE I *et al.* [16] (50%). The choice of frequency control rather than rhythm control is explained by the often late diagnosis, which limits the therapeutic options.

All our patients had a high thromboembolic risk (CHA2DS2-VASc ≥ 2) and received oral anticoagulation. AODs were the treatment of choice in 48% of patients, followed by VKAs (40%). This strategy is in line with international recommendations [22] [24], which favour OADs because of their favourable benefit-risk profile. Our results differ from those reported in other African studies [3] [16] where VKAs were more frequently used. This evolution suggests a gradual adoption of AODs, despite their higher cost, particularly in patients with the means to obtain them.

The predominant use of diuretics, particularly furosemide, is justified by their essential role in managing congestion and facilitating heart rate control in patients suffering from both heart failure and atrial fibrillation.

Systematic screening during consultations could prevent the onset of heart failure, particularly of rhythmic origin.

5. Conclusion

Atrial fibrillation and heart failure represent a double burden for public health in Guinea, with significant consequences for morbidity and mortality. AF,

which is particularly common in patients with rheumatic heart disease, is often under-diagnosed and more likely to be permanent. Although heart rate control is the preferred therapeutic strategy, access to anticoagulant treatments, particularly AODs, remains limited for some patients due to their cost. Despite this, AODs are becoming more widely available in clinical practice. The prevalence of AF in a young population with little education highlights the importance of setting up prevention and early detection programmes, targeting at-risk populations in particular.

Conflicts of Interest

The authors declare no conflict of interest regarding the publication of this article.

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Appendix

Survey Form

1) Civil Status

Age: …… Sex: …….. Profession: ……

Length of hospital stay: …….. Level of education: ……..

2) History and background

Known FA: Yes/No stroke: Yes/No

Known heart disease: Yes/No If yes, specify type……

Heart failure: Yes/No Dysthyroidism: Yes/No

kidney failure: Yes/No

3) Cardiovascular Risk Factors

HTA: Yes/No Diabetes: Yes/No Tobacco: Yes/No AP……

Alcohol: Yes/No Obesity: Yes/No Dyslipidemia: yes/No

4) Symptoms:

Palpitation: Yes/No

Dyspnoea: Yes/No NYHA stage: …..;

Precordialgia: Yes/No ;

Lipothymia: Yes/No

Other: ……..

5) Clinical Examination

- parameters: ----------

- Clinical examination:

- Risk score:

Score CHA_2 DS_2 VASc: …….. HAS-BLED: …….

6) Paraclinical examinations

Biology: ----------

ECG:----------

HOLTER ECG: …….

Trans-Thoracic Ultrasound

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7) Positive Diagnosis:

Paroxysmal Atrial Fibrillation: persistent Atrial Fibrillation:

Permanent Atrial Fibrillation:

Underlying heart disease: …….

Mode of onset of HF: Don't know ……. After onset of AF …….
Before the onset of AF ……

8) Treatment

Reduction of arrhythmia: Yes/No…….
Frequency control: Yes/No
Prevention of thromboembolic events: Yes/No

Others

Diuretic: …… IEC/ARAII: …… BB: ……
calcium channel blockers: ……
Mineralocorticoid antagonist: ……..……