

Epidemiology of the Association between Atrial Fibrillation and Heart Failure in the Cardiology Department of the Hôpital National Ignace Deen

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Abstract

Introduction: Atrial fibrillation (AF) and heart failure (HF) are two closely related cardiovascular diseases, whose association worsens prognosis and is a major public health concern. The aim of this study was to assess the prevalence of AF in patients with chronic heart failure at the cardiology department of CHU Ignace Deen. **Methods:** This was a cross-sectional, descriptive study conducted over a 7-month period, from April 1 to November 30, 2024, of patients hospitalized for IC associated with AF. **Results:** Out of 377 admissions, 31 cases of IC associated with AF were identified, representing a hospital prevalence of 8.22%. The majority of patients were men (70.96%; sex ratio: 2.4), with an average age of 58.8 ± 12.4 years. The age groups most affected were 51 - 60 years (41%) and 71 - 80 years (22.5%). The main risk factors included arterial hypertension (48.38%), diabetes (22.58%) and smoking (16.22%). The most frequent etiologies of AF-associated CI were coronary artery disease (48.38%), hypertension (25.89%) and valvular heart disease (9.67%). CHA2DS2-VASc score ≥ 3 was present in 38.70% of patients. Direct oral anticoagulants (DACs) were the most widely used antithrombotic therapy (64.51%), while beta-blockers were the most prescribed antiarrhythmic drugs (58.06%), followed by digoxin (32.25%). **Conclusion:** The increase in coronary artery disease and hypertension in Africa is helping to make atrial fibrillation a frequent cardiac rhythm disorder in hospitals.

Keywords

Heart Failure, Atrial Fibrillation, CHU d'Ignace DEEN, Conakry

1. Introduction

Atrial fibrillation (AF) is characterized by rapid, disorganized electrical activity of the atrial myocardium [1]. This pathology, often associated with heart failure (HF), worsens the prognosis of patients and represents a major public health issue [2] [3]. The risks associated with AF are mainly hemodynamic and thromboembolic, with a significant contribution to strokes, which are attributable to AF in around 15% of cases [4].

The prevalence of AF in the general population is estimated at 1%, with a notable increase in the elderly [5]. Patients with AF have twice the overall and cardiovascular mortality of the general population [4]. There are around 2.4 million cases in the USA and 6 million in Europe [6].

In Africa, AF is most often associated with heart disease, accounting for 90.7% of cases [7]. It was found in 11.39% of consultations at the Centre Hospitalier Universitaire Gabriel Touré between January and August 2012 [8] and in 4.27% of cases in the cardiology department of the Yalgado Ouédraogo Hospital in Burkina Faso [9].

Management of AF in Africa remains limited due to technical shortcomings and multiple associated etiologies [8]. The aim of this study was to assess the prevalence of atrial fibrillation in patients with chronic heart failure in the cardiology department of CHU Ignace Deen.

2. Materials and Methods

Study setting: This study was conducted in the cardiology department of Hôpital National Ignace Deen.

Study period and type: This was a retrospective, cross-sectional, descriptive study conducted over a 7-month period, from April 1 to November 30, 2024.

Study population: The study included patients of both sexes, aged over 18, admitted or seen in consultation for chronic heart failure diagnosed on clinical criteria and confirmed by Doppler echocardiography, associated with atrial fibrillation.

Patients under 18 years of age and those without heart failure or atrial fibrillation were excluded from the study.

Data collection: data were collected using an individual follow-up form, systematically including sociodemographic, clinical, electrocardiographic and echocardiographic information from patients' files.

Data entry and analysis: The data collected were analyzed using SPSS version 26 software and entered into Microsoft Word 2016.

Ethical considerations: Participation in this study was entirely voluntary.

Confidentiality and anonymity of patient data were strictly respected throughout the study.

3. Results

Of the 377 admissions, 31 cases involved atrial fibrillation associated with heart failure, representing a hospital prevalence of 8.22%. The majority of patients were men (70.96%), with a sex ratio of 2.4. The age groups most affected were 51 - 60 years (41%) and 71 - 80 years (22.5%), with a mean age of 58.8 ± 12.4 years (**Table 1**).

The main risk factors identified were hypertension (48.38%), diabetes (22.58%) and smoking (16.22%) (**Table 2**). Causes of chronic heart failure associated with atrial fibrillation included coronary artery disease (48.38%), hypertension (25.89%) and valvular heart disease (9.67%) (**Table 3**).

A CHA2DS2-VASc score of 3 was the most frequent, observed in 38.70% of patients (**Table 4**). Among antithrombotic molecules, direct oral anticoagulants (DOACs) were the most prescribed, accounting for 64.51% of cases (**Table 5**). As for antiarrhythmic treatments, beta-blockers were the most widely used (58.6%), followed by digoxin, used in 32.25% of cases (**Table 6**).

Table 1. Distribution of patients by socio-demographic characteristics.

Features	Workforce	Percentage
Age (years)		
• 31 - 40	3	9.6
• 41 - 50	2	6.45
• 51 - 60	13	41
• 61 - 70	6	19.35
• 71 - 80	7	22.5
Mean \pm Et [extremes]	58.8 \pm 12.4	[31 - 80]
Gender		
• Male	22	70.96
• Female	9	29.03
Ratio (M/F)	2.4	

Table 2. Cardiovascular risk factors in the association of heart failure and atrial fibrillation.

Features	Workforce	Percentage
HTA	15	48.38
Diabt	7	22.58
Smoking	5	16.12
Obesity	2	6.45
Dyslipidemia	2	6.45

Table 3. Etiologies of heart failure in patients with atrial fibrillation.

Etiologies	Workforce	Percentage
Coronary artery disease	15	48.4
Valvulopathies	3	9.67
Hypertensives	8	25.8
Chronic pulmonary heart disease	3	9.67

Table 4. Distribution of patients by CHA2DS2-VASc score.

CHA2DS2-VASc	Workforce	Percentage
CHA2DS2-VASc = 0	1	3.22
CHA2DS2-VASc = 1	3	9.67
CHA2DS2VA-Sc = 2	5	16.12
CHA2DS2-VASc = 3	12	38.7
CHA2DS2-VASc = 4	5	16.12
CHA2DS2-VASc = 5	3	9.67
CHA2DS2-VASc = 6	2	6.45
Total		

Table 5. Distribution of patients according to antithrombotic treatments prescribed.

Anti-thrombotic	Workforce	Percentage
VKA	11	35.48
• Fluindione 20 mg	4	12.9
• Acenocoumarol 4 mg	7	22.58
AOD	20	64.51
• Rivaroxaban 15 mg	8	25.8
• Apixaban 5 mg	12	38.7

Legend: AVK: antivitamins K, AAP: antiplatelet agents AOD: direct oral anticoagulants.

Table 6. Distribution of patients according to molecules used in antiarrhythmic therapy.

Etiologies	Workforce	Percentage
Digoxin	10	32.25
Beta blocking	18	58.06
Amiodarone	2	6.45
Sotalol	1	3.22

4. Discussion

Heart failure and atrial fibrillation are closely linked: almost all patients with chronic heart failure develop atrial fibrillation sooner or later [10].

In our study, the hospital prevalence of atrial fibrillation (AF) in patients with heart failure was **8.22%**, a result comparable with the literature, which reports rates ranging from **10% to 30%** [11]. Several pathophysiological mechanisms explain this association between AF and heart failure: loss of atrial contribution to ventricular filling reduces cardiac output and leads to an increase in mean arterial pressure, precipitating heart failure in predisposed patients [12].

The mean age observed in our study was 58.8 ± 12.4 years, which is higher than that reported in the study by Mariko S *et al.* in 2021 (45 ± 10 years) [13] consistent with data from some studies [14] [15].

Arterial hypertension (AH) represented the main cardiovascular risk factor in our series, affecting **48.38%** of patients, a result in agreement with similar studies [15] [16]. The etiology of heart failure in our cohort was predominantly related to coronary artery disease, which differs from the findings of Thiam, who identified valvular pathology as the predominant cause of AF in heart failure patients [17].

With regard to anticoagulant therapy, **apixaban (5 mg)** was the most frequently prescribed molecule in our series (**38.70%**) among the **64.51%** of direct oral anticoagulants. However, Mariko S *et al.* in 2021 [13] found that fluindione was the most frequently prescribed drug, accounting for 40% of 53.3% of VKA prescriptions. This treatment plays a crucial role in reducing mortality associated with AF and preventing strokes, the leading cause of dependency in elderly subjects [17].

Finally, of the drugs used to control cardiac rhythm, beta-blockers were the most prescribed (**58.06%**), followed by digoxin (**32.25%**) and amiodarone (**6.45%**). Atrial fibrillation (AF) and heart failure (HF) frequently coexist. Their management relies on strategies aimed at controlling heart rate or rhythm to improve symptoms and reduce the risk of cardiovascular events. The choice of drugs is influenced by their mechanisms of action, tolerability and efficacy in this particular context. Indeed, in heart failure, neurohormonal imbalance and activation of the renin-angiotensin-aldosterone system induce maladaptive physiological changes, such as elevated filling pressures and afterload, favoring stretching and fibrosis of the left atrium, contributing to conduction abnormalities and the development of atrial fibrillation [17].

5. Conclusion

The development of coronary artery disease and hypertension in Africa has made atrial fibrillation a frequent cardiac rhythm disorder in hospitals. It affects elderly subjects, and the etiological factor is dominated by arterial hypertension. The risk of cerebrovascular accidents must justify effective management to prevent these complications, which are potentially serious and incapacitating.

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Authors' Contributions

Diallo Hassatou, Camara OM, Keita FB, contributed to the design of the study and discussion of the results.

Camara Ousmane Mamadama and Keita Fatoumata Binta contributed to data collection and analysis of statistical data for the study.

Abdoulaye Fodé TOURE played an active role in drafting the manuscript and editing the article, ensuring that the information presented was accurate and clear.

Kaba Abdoul Karim actively participated in the translation of the manuscript into English.

Conflicts of Interest

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

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