Scientific Research Publishing

World Journal of Cardiovascular Diseases, 2026, 16(2), 137-146
https://www.scirp.org/journal/wjcd
ISSN Online: 2164-5337
ISSN Print: 2164-5329

Atrial Fibrillation: Epidemiological, Clinical, Paraclinical, and Therapeutic Aspects in the Cardiology B Department of the Brazzaville University Hospital (Republic of Congo)

Eric Gibrel Kimbally-Kaky[1,2*], Solange Flore Ngamami Mongo[1,2], Thibaut Naïbe Gankama[2,3], Jospin Karel Bassakouahou Makani[3], Franck Yannis Kouikan[1], Christian Michel Kouala Landa[1,2], Kivié Mou-Moué Ngolo Letomo[1], Rog Patern Bakekolo[1,2], Bertrand Fikahem Ellenga Mbolla[1,2]

[1]Department of Cardiology B and Internal Medicine, Brazzaville University Hospital, Republic of Congo
[2]Faculty of Health Sciences, Marien Ngouabi University, Brazzaville, Republic of Congo
[3]Department of Cardiology A and Internal Medicine, Brazzaville University Hospital, Republic of Congo
Email: *kimballykakyg@gmail.com

How to cite this paper: Kimbally-Kaky, E.G., Mongo Ngamami, S.F., Gankama, T.N., Makani, J.K.B., Kouikani, F.Y., Kouala Landa, C.M., Ngolo Letomo, K.M.-M., Bakekolo, R.P. and Ellenga Mbolla, B.F. (2026) Atrial Fibrillation: Epidemiological, Clinical, Paraclinical, and Therapeutic Aspects in the Cardiology B Department of the Brazzaville University Hospital (Republic of Congo). *World Journal of Cardiovascular Diseases*, **16**, 137-146.
https://doi.org/10.4236/wjcd.2026.162014

Received: December 28, 2025
Accepted: February 25, 2026
Published: February 28, 2026

Copyright © 2026 by author(s) and Scientific Research Publishing Inc.
This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).
http://creativecommons.org/licenses/by/4.0/

Open Access

Abstract

Introduction: Atrial fibrillation (AF) is the most frequent cardiac arrhythmia encountered in clinical practice. The aim of this study was to assess the frequency of AF and to describe its epidemiological, clinical, paraclinical, and therapeutic characteristics in a Congolese hospital setting. **Patients and Methods:** This was a retrospective, descriptive study conducted in the Cardiology Department B of the Brazzaville University Hospital from January 1, 2022, to December 31, 2024. Medical records of patients hospitalized for atrial fibrillation were included. **Results:** Among 1550 patients admitted to the Cardiology B Department, 65 cases of AF were identified (4.2%). There were 41 women (63%). The mean age was 66.7 ± 15.4 years (range: 24 - 101 years). Past medical history included hypertension (61.5%), type 2 diabetes mellitus (12.3%), and ischemic stroke (6.1%). Dyspnea was present in 93.8% of cases. The mean heart rate was 101.5 ± 28.1 beats per minute. Clinical presentations included heart failure (81.5%) and left hemibody neurological deficit (9.2%). Electrocardiography revealed fine atrial fibrillation in 89.2% of cases. AF was permanent in 58.5%, persistent in 21.5%, and paroxysmal in 20%. Echocardiography showed left atrial enlargement in 36.9%, impaired left ventricular systolic function in 21.5%, reduced function in 20%, and preserved function in 4.6%. The predominant cardiac etiologies were hypertension (83%), including 61.5%

as a cardiovascular risk factor and 21.5% as hypertensive heart disease, rheumatic valvular heart disease and dilated cardiomyopathy (27.7% each), and ischemic heart disease (6.1%). Treatment included digitalis (58.5%), beta-blockers (43.5%), and amiodarone (10.7%). Anticoagulant therapy was used in 75.4% of patients: vitamin K antagonists (58.5%) and direct oral anticoagulants (16.9%). In-hospital mortality occurred in six patients (9.2%). **Conclusion:** Atrial fibrillation remains frequent in the Congolese hospital setting and is mainly dominated by hemodynamic complications. Therapeutic management is essentially based on heart rate control and prevention of complications.

Keywords

Atrial Fibrillation, Hypertension, Heart Failure, Congo

1. Introduction

Atrial fibrillation (AF) is a supraventricular arrhythmia characterised by chaotic and rapid electrical activity of the atrial myocardium. It is the most common cardiac rhythm disorder encountered in clinical practice [1]. Its prevalence in the general population ranges from 2% to 4%, and the number of patients with AF is expected to increase two- to threefold by 2050 due to population ageing [2].

In sub-Saharan Africa, available data are mainly derived from hospital-based series, with reported frequencies ranging from 4.8% to 14.2% [3]-[7]. The main aetiologies are rheumatic and hypertensive heart diseases, while coronary artery disease is increasingly reported.

In Congo, Bouramoue *et al.* [8] showed that AF was the most frequent arrhythmia associated with hypertension in adults. A frequency of 7.1% was reported in Brazzaville [9]. Haemodynamic and thromboembolic complications, particularly cerebrovascular events, account for the severity of this condition [10].

The aim of this study was to determine the frequency of atrial fibrillation and to describe its epidemiological, clinical, paraclinical, and therapeutic aspects.

2. Patients and Methods

This was a retrospective, descriptive, single-centre study conducted in the Cardiology Department B of the Brazzaville University Hospital from January 1, 2022, to December 31, 2024 (three years). The study included patients aged 18 years and older who were hospitalised for atrial fibrillation confirmed by a standard 12-lead electrocardiogram, regardless of the duration of the arrhythmia. Incomplete medical records without electrocardiographic documentation, patients transferred before completion of the aetiological work-up, and cases of isolated atrial flutter were excluded.

This chart review was conducted with administrative authorization from the

Department of Cardiology B and the Medical Director of Brazzaville University Hospital for access to medical records. The study adhered to fundamental ethical principles, including complete anonymization of patient data with no collection of personally identifiable information, strict maintenance of patient confidentiality, and use of data solely for research and quality improvement purposes. All procedures were conducted in accordance with the ethical standards of the Declaration of Helsinki.

Clinical, electrocardiographic, echocardiographic, and biological data were collected from medical records. Paraclinical assessment systematically included a 12-lead electrocardiogram, chest radiography, and transthoracic echocardiography performed according to current recommendations. Standard laboratory tests included a complete blood count, fasting blood glucose, serum creatinine, serum electrolytes, and liver function tests; thyroid-stimulating hormone (TSH) levels were measured depending on availability and clinical indication.

The parameters analysed were age, sex, cardiovascular risk factors, type of atrial fibrillation, aetiologies of AF, treatment, and complications. The CHA_2DS_2-VASc score was used to assess thromboembolic risk, and the HAS-BLED score was used to assess bleeding risk. Therapeutic strategies, treatments administered, and patient outcomes were also analysed.

3. Operational Definitions

AF was classified into three evolutionary forms [11]: paroxysmal AF when the duration was less than 7 days, persistent AF when it lasted more than 7 days, and permanent AF when cardioversion had failed or was not indicated, or when AF had lasted for more than one year with long-term persistence.

Valvular heart disease was defined as chronic involvement of cardiac valves, mainly the mitral valve, resulting from post-infectious inflammatory lesions following acute rheumatic fever or untreated streptococcal pharyngitis. These lesions may present as stenosis or, more frequently, regurgitation.

Left ventricular ejection fraction (LVEF) was defined as the proportion of end-diastolic blood volume ejected by the left ventricle into the aorta during systole, expressed as a percentage. LVEF was considered normal between 50% and 70%, moderately reduced between 40% and 49%, and severely impaired below 40%.

Systolic pulmonary arterial pressure (sPAP) was defined as the pressure in the pulmonary arteries at peak cardiac systole, normally around 25 mmHg. Values above 25 - 30 mmHg were considered elevated and indicative of pulmonary arterial hypertension.

The CHA_2DS_2-VASc score [12] was calculated as follows: heart failure or LVEF < 40% (1 point), age > 75 years (2 points), diabetes mellitus (1 point), stroke or peripheral embolism (2 points), vascular disease (myocardial infarction, peripheral artery disease, or aortic plaque) (2 points), female sex (1 point), and age 65–74 years (1 point). Thromboembolic risk was considered low for a score of 0, intermediate for a score of 1, and high for a score ≥ 2.

The HAS-BLED score [13] was calculated based on the following parameters: hypertension (1 point), renal or hepatic dysfunction (1 point), stroke (1 point), bleeding history (1 point), unstable INR (1 point), age > 65 years (1 point), and drug or alcohol use (1 or 2 points). A score of 0 - 2 indicated low bleeding risk, 3 intermediate risk, and ≥ 4 high risk.

Statistical Analysis: Data were recorded using a pre-established data collection form and analysed using Epi Info version 7 software. Quantitative variables were expressed as mean ± standard deviation, and qualitative variables as numbers and percentages.

4. Results

Frequency and Epidemiological, Clinical, and Paraclinical Aspects

During the three-year study period, a total of 1550 patients were admitted to the Cardiology B Department of Brazzaville University Hospital. Among these cardiology admissions, 65 patients (4.2%) were diagnosed with atrial fibrillation. There were 24 men (37%) and 41 women (63%), with a sex ratio of 0.59. The mean age was 66.7 ± 15.4 years (range: 24 - 101 years), and 61.5% (n = 40) of patients were older than 65 years.

Known cardiovascular risk factors included hypertension in 40 patients (61.5%), type 2 diabetes mellitus in 8 patients (12.3%), and a history of ischaemic stroke in 6 patients (9.2%). Dyspnoea was reported in 61 patients (93.8%), followed by palpitations in 32 patients (49.2%) and chest pain in 3 cases (4.6%). The mean heart rate was 101.5 ± 28.1 beats per minute (range: 36 - 160 bpm). On admission, heart failure was present in 53 patients (81.5%), and recent-onset left-sided hemibody deficit was noted in 2 patients (3%).

Standard 12-lead electrocardiography confirmed atrial fibrillation characterized by the absence of discrete P waves and irregular RR intervals in all 65 cases. AF was permanent in 38 cases (58.5%), persistent in 14 cases (21.5%), and paroxysmal in 13 cases (20%). Other electrocardiographic abnormalities are presented in Table 1. Chest radiography revealed cardiomegaly in 54 cases (83.1%). Transthoracic echocardiography showed left atrial dilatation in 22 patients (36.9%). LVEF was preserved in 38 patients (58.5%), impaired in 14 patients (21.5%), and reduced in 13 patients (20%). Echocardiography was normal in three cases (4.6%). Other echocardiographic findings included spontaneous echo contrast in one case (1.5%) and left ventricular thrombus in one case (1.5%). Systolic pulmonary arterial pressure was elevated in 19 cases (29.2%).

Regarding aetiologies, hypertensive heart disease accounted for 14 cases (21.5%), rheumatic valvular heart disease for 18 cases (27.7%), including 12 cases of mitral regurgitation, and dilated cardiomyopathy in similar proportions. Ischaemic heart disease was found in 4 cases (6.1%), including 3 cases of acute coronary syndrome. Among the 22 patients who underwent TSH testing, 4 (6.2%) had low levels. Other aetiologies are listed in Table 1. AF was idiopathic in 3 cases (4.6%).

Table 1. General characteristics of the study population.

Variable	General Population n (%)
Age (years), mean ± SD	66.7 ± 15.4
Sex n (%)	
Male	24 (37%)
Female	41 (63%)
Cardiovascular risk factors n (%)	
Hypertension	40 (61.5%)
Type 2 diabetes mellitus	8 (12.3%)
History of ischaemic stroke	4 (6.1%)
Obesity	4 (6.1%)
Dyslipidaemia	1 (1.5%)
AF symptoms/physical signs n (%)	
Dyspnoea	61 (93.8%)
Palpitations	32 (50.7%)
Prolonged chest pain	3 (4.6%)
Heart failure	53 (81.5%)
Hemibody neurological deficit**	6 (9.2%)
Electrocardiogram n (%)	
Fine atrial fibrillation	58 (89.2%)
Left ventricular hypertrophy	5 (7.7%)
Acute coronary syndrome (ACS)	3 (4.6%)
Complete atrioventricular block	1 (1.5%)
Sequelae of myocardial necrosis	1 (1.5%)
Aetiologies n (%)	
Rheumatic valvular heart disease*	18 (27.7%)
Dilated cardiomyopathy	18 (27.7%)
Hypertensive heart disease	14 (21.5%)
Acute alcohol intoxication	14 (21.5%)
Ischaemic heart disease***	4 (6.1%)
Hyperthyroidism	3 (4.6%)
Hypertrophic cardiomyopathy	1 (1.5%)

**Stroke = cerebrovascular accident (including 2 recent cases); *Mitral regurgitation (n = 12); **Stroke sequelae (n = 4); *Ischaemic heart disease (n = 4, including 3 cases of acute coronary syndrome and 1 case of myocardial necrosis sequelae).

5. Therapeutic Aspects

Rate-control therapy included digitalis in 38 cases (58.5%) and beta-blockers in 28 cases (43.1%). Pharmacological cardioversion with amiodarone was achieved in 7 cases (10.7%). Anticoagulant therapy was used in 49 cases (75.4%). The CHA_2DS_2-VASc score was high (≥ 2) in 55 cases (84.6%), while thromboembolic risk was intermediate in 10 cases (15.4%). The mean CHA_2DS_2-VASc score was 2.07 ± 1.91. The HAS-BLED score indicated low bleeding risk in 55 patients (84.6%).

Anticoagulation with low-molecular-weight or unfractionated heparin followed by vitamin K antagonists (acenocoumarol) was used in 38 patients (58.5%). A direct oral anticoagulant (apixaban) was prescribed in 11 patients (16.9%).

6. Complications

Recorded complications included heart failure in 53 patients (81.5%) and ischaemic stroke in 6 cases (9.2%). In-hospital mortality occurred in 6 patients (9.2%). All deaths were attributable to severe hemodynamic complications: refractory acute heart failure (n = 4), cardiogenic shock (n = 1), and massive ischemic stroke (n = 1). No systematic post-discharge follow-up was available for surviving patients.

7. Discussion

7.1. Epidemiological, Clinical, and Paraclinical Aspects

Methodological limitations: The relatively small sample size constituted a limitation of this study due to missing data, which partly explains the observed frequency of 4.2%, lower than the 7.1% reported by Ellenga Mbolla *et al.* [9] in a series of 131 cases. Hospital-based data vary across Africa, with reported frequencies of 4.8% in Timbuktu, Mali [3], and 7.7% at the Principal Hospital of Dakar [5].

The study population was relatively elderly, with a mean age of 66.7 years, similar to the findings of Mboup *et al.* in Dakar [5], where the mean age was 67 years. In contrast, other series from Dakar [7] [14] and earlier data from Brazzaville [9] reported younger populations, with mean ages of 47, 57, and 59 years. This difference may be explained by the higher prevalence of rheumatic heart disease affecting younger individuals in developing countries [3]-[7] [9] [14] [15].

Dyspnoea, the main functional symptom in this study, was also predominant in reports from Madagascar, Brazzaville, Dakar, and Yaoundé [4] [9] [16]. Heart failure, present in 81.5% of our cases, likely reflects late presentation, with patients being admitted at an advanced stage of heart disease. Delayed consultation may also lead to ventricular rate abnormalities, resulting in tachycardia-induced cardiomyopathy, implicated in 25% to 50% of left ventricular dysfunctions [17].

Thromboembolic complications were infrequently observed at admission (3%), exclusively neurological, in contrast to the Brazzaville series [9], which reported 16%. The small sample size and admission of acute stroke cases to other hospital departments may explain this discrepancy.

Regarding aetiologies, hypertension remains one of the main causes of AF [17], as confirmed in this study, where it was the leading cause. Similar high proportions (33% - 55%) have been reported in other series [9] [18] [19]. Difficulties in hypertension management in Africa [3] [4] [14] [15] [20] are related to medication costs and inadequate therapeutic education. Rheumatic valvular heart disease, observed in 27.7% of cases, remains prevalent in several African countries [3]-[7] [9] [14] [15]. Its prevention relies on effective treatment of streptococcal pharyngitis in children, which remains a major challenge.

Ischaemic heart disease, found in 4.6% of cases, is increasing across Africa, with reported proportions ranging from 5.6% to 14.5% [3] [4] [9]. Lifestyle changes and the rise in cardiovascular risk factors may account for this trend.

Hyperthyroidism, another cause of AF, was infrequently observed in our series, a finding that is likely related to incomplete thyroid function assessment, as TSH was measured in only one-third of patients. This limited and selective testing may have led to underestimation of thyroid-related AF, particularly in a context marked by financial constraints, restricted laboratory access, and testing guided mainly by clinical suspicion. In contrast, higher proportions have been reported in Morocco (16%) [20], underscoring the role of cardiothyrotoxicosis when systematic screening is performed.

Electrocardiographic classification showed a high prevalence of permanent AF, similar to findings in Mali (63%) [21], Dakar (58.5%) [14], and the present study (57%). This reflects chronic underlying heart disease with cardiac dilatation. Persistent AF was observed in 61.1% of cases in Morocco [20], but less frequently in Dakar and in this study (21.5% and 20%, respectively).

Echocardiographic findings varied across studies. Impaired LVEF was observed in 21.5% of cases in this study, compared with 52.4% in Madagascar [4] and 16.7% in Dakar [5]. Delayed diagnosis and treatment may explain left ventricular dysfunction.

7.2. Epidemiological Specificities in the African Context

Compared with contemporary international registries, notable differences were observed. In the GARFIELD-AF registry [23], the mean age was 70 years with male predominance (55.6%), whereas our patients were slightly younger (66.7 years) with female predominance (63%). This may reflect longer female life expectancy or disparities in access to healthcare.

The aetiological profile also differed significantly. In the Euro Heart Survey on Atrial Fibrillation [24], hypertension accounted for 49% of cases and rheumatic valvular heart disease for less than 5%, compared with 27.7% in our series, reflecting the persistence of acute rheumatic fever in sub-Saharan Africa.

The high rate of heart failure at admission (81.5%) contrasts with the 30% - 40% reported in Western registries [23] [24], suggesting major delays in diagnosis and treatment due to limited awareness, geographic and financial barriers, and medication non-adherence.

7.3. Therapeutic Aspects

The most commonly used rate-control drugs were digitalis, followed by beta-blockers and amiodarone. According to the 2020 ESC guidelines [2], beta-blockers are first-line therapy for heart rate control in AF. However, the high prevalence of heart failure in this study justified the preferential use of digitalis. Similar therapeutic approaches have been reported in Cameroon [6] [16]. Rate-control strategies are predominant in Africa [22], as patients often present with permanent AF and heart failure, explaining the absence of electrical cardioversion in this series.

Pharmacological cardioversion with amiodarone was achieved in 10.7% of cases. Anticoagulation therapy, based on CHA_2DS_2-VASc score assessment [12], was prescribed in most patients. The mean CHA_2DS_2-VASc score was 2.07, comparable to findings in Cameroon [6]. Vitamin K antagonists were the most commonly prescribed anticoagulants, followed by direct oral anticoagulants, whose high cost limits their use in low-resource settings. In-hospital mortality was 9.2% (6/65 patients), which is comparable to rates reported in other African series ranging from 7% to 15%. All deaths occurred in patients presenting with severe hemodynamic decompensation, highlighting the critical importance of early diagnosis and timely therapeutic intervention. This in-hospital mortality rate is higher than contemporary Western registries reporting 2% - 4%, likely reflecting: delayed presentation with advanced heart failure (81.5% of our cohort), limited access to intensive cardiac care and mechanical circulatory support, and high prevalence of advanced structural heart disease at admission. The restriction to in-hospital deaths likely underestimates total AF-related mortality, as post-discharge events including thromboembolism and progressive heart failure, could not be captured.

7.4. Anticoagulation Therapy and Treatment Gapes

Despite 84.6% of patients having a CHA_2DS_2-VASc score ≥2 indicating a class I recommendation for oral anticoagulation according to ESC guidelines only 75.4% received anticoagulant therapy resulting in a 10.9% treatment gap attributable to multiple barriers typical of resource limited settings including high economic burden related to INR monitoring for vitamin K antagonists and the high monthly cost of direct oral anticoagulants clinical contraindications such as bleeding risk uncontrolled hypertension or high HAS BLED scores healthcare system limitations with restricted access to INR testing limited follow up structures and geographic constraints as well as patient related factors including poor health literacy fear of bleeding and non adherence a pattern similar to that reported across sub Saharan Africa highlighting the need for improved access through subsidized treatment decentralized monitoring patient education and dedicated anticoagulation services.

8. Conclusion

The frequency of atrial fibrillation remains high in the Congolese hospital setting. Clinical presentations are dominated by heart failure. Hypertension is the main

aetiological factor, followed by valvular heart disease. Therapeutic management primarily relies on heart rate control using digitalis, beta-blockers, and amiodarone. Thromboembolic prevention is achieved in most cases using vitamin K antagonists. Prevention of atrial fibrillation requires appropriate lifestyle measures, including a low-salt, low-sugar, and low-animal-fat diet; moderate alcohol consumption; weight and stress control; regular physical activity; and smoking cessation.

Conflicts of Interest

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

References

[1] Rahman, F., Kwan, G.F. and Benjamin, E.J. (2014) Global Epidemiology of Atrial Fibrillation. *Nature Reviews Cardiology*, **11**, 639-654. https://doi.org/10.1038/nrcardio.2014.118

[2] Hindricks, G., Potpara, T., Dagres, N., Arbelo, E., Bax, J.J., Blomström-Lundqvist, C., *et al.* (2020) 2020 ESC Guidelines for the Diagnosis and Management of Atrial Fibrillation Developed in Collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). *European Heart Journal*, **42**, 373-498. https://doi.org/10.1093/eurheartj/ehaa612

[3] Traoré, B., Sidibé, S., Kantako, K., *et al.* (2021) Atrial Fibrillation at the Tombouctou Hospital: Frequency, Aetiologies, Treatment, and Outcome. *Health Sciences and Disease*, **22**, 79-82.

[4] Rakotonaivo, A., Raveloson, F.H.R., Ramiandrisoa, L.R. and Rabearivony, N. (2020) Epidemiological and Clinical Profile of Atrial Fibrillation in the Cardiology Department of CHU-JRB, Madagascar. *JACCR Africa*, **4**, 171-176.

[5] Mboup, W.N., Dia, K., Ka Mame, M., *et al.* (2024) Atrial Fibrillation at the Principal Hospital of Dakar, Senegal: Results and Limitations of Management. *Annales de Cardiologie et d'Angéiologie*, 73, Article ID: 101758.

[6] Boombhi, J., Menanga, A., Mfeukeu-Kuaté, L., *et al.* (2019) Clinical and Therapeutic Characteristics of Atrial Fibrillation in a Hospital Setting in Yaoundé, Cameroon. *Health Sciences and Disease*, **20**, 23-26.

[7] Mboup, M.C., Kane, A., Jobe, M., Ndiaye, M.B., Bodian, M., Mbaye, A., *et al.* (2022) Prospective Evaluation of Hospitalized Patients with Atrial Fibrillation in Senegal. *Postgraduate Medical Journal of Ghana*, **4**, 19-22. https://doi.org/10.60014/pmjg.v4i1.80

[8] Bouramoue, C., Kimbally-Kaky, G. and Ekoba, J. (2002) Adult Hypertension at the Brazzaville University Hospital: A Study of 4,928 Cases. *Médecine d'Afrique noire*, **49**, 191-196.

[9] Ellenga Mbolla, B.F., Gombet, T., Ikama, M.S., *et al.* (2006) Atrial Fibrillation: A Report of 131 Congolese Cases. *Médecine d'Afrique noire*, **53**, 73-78.

[10] Le Heuzey, J., Otmani, A., Marijon, E., Waintraub, X., Lepillier, A., Chachoua, K., *et al.* (2008) Fibrillation atriale: Le plus fréquent des troubles du rythme. *La Presse Médicale*, **37**, 821-826. https://doi.org/10.1016/j.lpm.2007.09.019

[11] Camm, A.J., Kirchhof, P., Lip, G.Y.H., *et al.* (2010) ESC Guidelines for the Management of Atrial Fibrillation. *European Heart Journal*, **31**, 2369-2429.

[12] Lip, G.Y.H., Nieuwlaat, R., Pisters, R., Lane, D.A. and Crijns, H.J.G.M. (2010) Refin-

ing Clinical Risk Stratification for Predicting Stroke and Thromboembolism in Atrial Fibrillation Using a Novel Risk Factor-Based Approach. *Chest*, **137**, 263-272. https://doi.org/10.1378/chest.09-1584

[13] Shoeb, M. and Fang, M.C. (2013) Assessing Bleeding Risk in Patients Taking Anticoagulants. *Journal of Thrombosis and Thrombolysis*, **35**, 312-319. https://doi.org/10.1007/s11239-013-0899-7

[14] Mbaye, A., Pessinaba, S., Bodiane, M,. *et al.* (2010) Atrial Fibrillation: Frequency, Aetiological Factors, Outcome, and Treatment in a Cardiology Department in Dakar, Senegal. *Pan African Medical Journal*, **6**, Article 16.

[15] Longo-Mbenza, B., Kalonji, Y.A. and Milamba, J. (1993) Epidemiological and Electrocardiographic Aspects of Atrial Fibrillation in Black Adults in Congo. *Information Cardiologique*, **17**, 227-232.

[16] Ntep-Gweth, M., Zimmermann, M., Meiltz, A., Kingue, S., Ndobo, P., Urban, P., *et al.* (2010) Atrial Fibrillation in Africa: Clinical Characteristics, Prognosis, and Adherence to Guidelines in Cameroon. *Europace*, **12**, 482-487. https://doi.org/10.1093/europace/euq006

[17] Wang, T.J., Larson, M.G., Levy, D., Vasan, R.S., Leip, E.P., Wolf, P.A., *et al.* (2003) Temporal Relations of Atrial Fibrillation and Congestive Heart Failure and Their Joint Influence on Mortality. *Circulation*, **107**, 2920-2925. https://doi.org/10.1161/01.cir.0000072767.89944.6e

[18] Ragbaoui, Y., Chehbouni, C., Hammiri, A.E. and Habbal, R. (2017) Epidémiologie de l'association fibrillation atriale et insuffisance cardiaque. *Pan African Medical Journal*, **26**, Article 116. https://doi.org/10.11604/pamj.2017.26.116.11470

[19] Coulibaly, S., Diall, I.B., Menta, I., *et al.* (2013) Atrial Fibrillation in the Cardiology Department of Point G University Hospital: Clinical Features, Aetiological Factors, and Natural Course. *Tropical Cardiology*, **25**, 59-68.

[20] Lévy, S., Maarek, M., Coumel, P., Guize, L., Lekieffre, J., Medvedowsky, J., *et al.* (1999) Characterization of Different Subsets of Atrial Fibrillation in General Practice in France: The ALFA Study. *Circulation*, **99**, 3028-3035. https://doi.org/10.1161/01.cir.99.23.3028

[21] Sangaré, I., Bâ, H., Sagara, I., *et al.* (2022) Clinical and therapeutic aspects of atrial fibrillation in hospitalised patients at CHU Gabriel Touré. *Health Sciences and Disease*, **23**.

[22] Stambler, B. and Ngunga, L. (2015) Atrial Fibrillation in Sub-Saharan Africa: Epidemiology, Unmet Needs, and Treatment Options. *International Journal of General Medicine*, **8**, 231-242. https://doi.org/10.2147/ijgm.s84537

[23] Kakkar, A.K., Mueller, I., Bassand, J.P., *et al.* (2017) Risk Profiles and Antithrombotic Treatment of Patients Newly Diagnosed with Atrial Fibrillation: Insights from the GAR-FIELD-AF Registry. *American Heart Journal*, **183**, 1-9.

[24] Nieuwlaat, R., Capucci, A., Camm, A.J., Olsson, S.B., Andresen, D., Davies, D.W., *et al.* (2005) Atrial Fibrillation Management: A Prospective Survey in ESC Member Countries. *European Heart Journal*, **26**, 2422-2434. https://doi.org/10.1093/eurheartj/ehi505