Atrial fibrillation: An analysis of etiology and management pattern in a tertiary hospital in Port-harcourt, southern Nigeria

Akpa MR., Ofori S.

Abstract

Objective: Atrial fibrillation is the commonest chronic arrhythmia and the etiology is widely varied. The aim of this study was to determine the etiology, clinical characteristics and treatment offered to adult patients with atrial fibrillation managed in a referral hospital in Port Harcourt, southern Nigeria.

Methods: A retrospective study of all the patients referred to the cardiology unit or seen in the cardiac clinic with ECG evidence of atrial fibrillation over one year period July 2012 to June 2013 was carried out. Those with confirmed atrial fibrillation and had transthoracic echocardiographic evaluation were analyzed for the study. Clinical and demographic characteristics and treatment offered to the patients were obtained from their hospital notes. Stroke risk was retrospectively assessed using the CHADS2 score.

Results: Sixty-eight patients comprising twenty nine females and thirty nine males [ratio of 1;1.3] had complete data . Age range was 30-87 years and mean age was 59.81±14.22 years. Mean blood pressures were 126.03± 26.89 mmHg systolic and 67.22± 18.60 mmHg diastolic. Hypertensive heart disease was the diagnosis in forty patients [58.82%], dilated cardiomyopathy in thirteen [19.2%], rheumatic heart disease in ten [14.71%], thyrotoxicosis in three [4.41%], one each due to endomyocardial fibrosis [EMF] and Cor pulmonale. Ten patients (14.71%) had valvular atrial fibrillation (AF) while most [85.29%] had non-valvular AF. None of the patients had evidence of stroke risk evaluation in their notes and less than 10% received anticoagulation treatment despite all the patients having moderate to high risk of stroke from our own CHADS2 evaluation.

Conclusion: Hypertensive heart disease was the commonest cause of atrial fibrillation in patients seen Port Harcourt, Southern Nigeria, followed by dilated cardiomyopathy and rheumatic heart disease. Stroke risk evaluation was non-existent and adherence to guidelines in management of atrial fibrillation was sub-optimal.

Keywords: Atrial fibrillation, thrombosis, CHADS2 Score, stroke risk, hypertensive heart disease, cadiomyopathy.

Corresponding author: Akpa MR, E mail: akpamac@yahoo.com/ maclean.akpa@uniport.edu.ng

Department of Medicine, Faculty of Clinical Sciences, College of Health Sciences, University of Port Harcourt, Port Harcourt, Nigeria.

La fibrillation auriculaire: Une analyse de l'étiologie et le modèle de gestion dans un hôpital de soins tertiaires à Port-Harcourt, le sud du Nigeria

Akpa MR., Ofori S.

Résumé

Objectif: La fibrillation auriculaire est le plus fréquent d'arythmie chronique et l'étiologie est très varié. Le but de cette étude était de déterminer l'étiologie, les caractéristiques cliniques et les traitements offerts aux patients adultes atteints de fibrillation auriculaire gérée dans un hôpital de référence à Port Harcourt, au sud du Nigeria.

Méthodes: Une étude rétrospective de tous les patients référés à l'unité de cardiologie ou vu à la clinique cardiaque avec ECG preuves de la fibrillation auriculaire sur une période de l'année Juillet 2012 à Juin 2013 a été réalisée. Ceux souffrant de fibrillation auriculaire et avait confirmé l'évaluation échocardiographique transthoracique ont été analysés pour l'étude. Caractéristiques et le traitement cliniques et démographiques offerts aux patients ont été obtenus à partir de leurs notes de l'hôpital. Le risque d'AVC a été évaluée rétrospectivement en utilisant le score CHADS2.

Résultats: Soixante-huit patients comprenant vingt-neuf femmes et neuf hommes [trente rapport de 1; 1.3] disposaient de données complètes. Tranche d'âge était 30-87 ans et l'âge moyen était 59,81 ± 14,22 années. Tensions moyennes étaient 126.03 ± 26,89 mmHg systolique et 67,22 ± 18,60 mmHg. Cardiopathie hypertensive était le diagnostic en quarante patients [58,82%], la cardiomyopathie dilatée dans treize [19,2%], la cardiopathie rhumatismale sur dix [14,71%], la thyréotoxicose sur trois [4,41%], un chacun en raison de la fibrose endomyocardique [EMF] et un cœur pulmonaire. Dix patients (14,71%) avaient fibrillation auriculaire valvulaire (AF) alors que la plupart [85.29%] avaient une FA non valvulaire. Aucun des patients avait des preuves de l'évaluation du risque d'AVC dans leur notesand moins de 10% ont reçu un traitement anticoagulant, malgré tous les patients ayant un risque modéré à élevé d'AVC à partir de notre propre évaluation CHADS2.

Conclusion: la maladie cardiaque hypertensive était la cause la plus fréquente de la fibrillation auriculaire chez les patients vus Port Harcourt, Nigeria du Sud, suivie cardiomyopathie bydilated et les cardiopathies rhumatismales. l'évaluation du risque d'AVC Les patients ont été pas gérés conformément aux lignes directrices recommandées.

Mots-clés: fibrillation auriculaire, la thrombose, CHADS2 score, risque d'AVC, cardiopathie hypertensive, cadiomyopathy.

Auteur correspondant: Akpa MR, E mail: akpamac@yahoo.com/ maclean.akpa@uniport.edu.ng

Department of Medicine, Faculty of Clinical Sciences, College of Health Sciences, University of Port Harcourt, Port Harcourt, Nigeria.

INTRODUCTION

Atrial fibrillation (AF) remains the most common sustained cardiac arrhythmia (1). It substantially increases the risk of thromboembolism, stroke as well as heart failure thus interfering with the length and quality of life of those affected (1). Its prevalence increases with age. In developed nations of the world the overall prevalence is estimated at 1.5-2% of the general population and the average age group affected are individuals aged between 75 and 85 years of age and in this group, prevalence may be up to 9% (2). In these countries Atrial fibrillation is commoner in whites than in blacks, males are more frequently affected than females and majority of all cases are due to cardiovascular diseases such as coronary artery disease [CAD], hypertension, heart failure [CHF], diabetes and other conditions such asobesity and smoking with CAD and CHF as the commonest etiology (3,4).

In developing countries, AF is a growing public health problem due to the epidemiologic transition from communicable to non-communicable diseases. However in contrast to findings in the developed countries, African studies showed that hypertension, cardiomyopathies and valvular heart diseases were the commonest etiologies of atrial fibrillation (5,6,7).

Various professional guidelines recognize the need for and have recommended strategies to characterize the risk of thromboembolism and stroke from AF in order to reduce the morbidity and mortality associated with this disorder (2,7). However, despite the availability of regularly updated guidelines from various societies, the management of atrial fibrillation is sub-optimal in Nigeria and other parts of sub-Saharan Africa.

We hypothesized that evidence based strategies to prevent stroke may not be optimally implemented in a high risk population with AF. This study was aimed at determining the pattern of structural heart disease and treatment offered to patients presenting with atrial fibrillation in a referral hospital in Port Harcourt, Southern Nigeria.

MATERIALS AND METHODS

Study design and population: This was a retrospective analysis of patients' case records. All patients presenting to the cardiology unit of the internal medicine department of the university of Port Harcourt Teaching hospital over the period of July 2012 to June 2013 were identified. This hospital is a 600-bed tertiary hospital in Rivers State and receives referrals from within the state and neighboring states the South-South and South-East of Nigeria. The inclusion criteria were (i) all adults above the age of 18 years with atrial fibrillation confirmed by a resting ECG and (ii) those patients with good quality echocardiograms.

ECG was performed with a six channel twelve lead GE Cardiovit^{R} machine from the ECG laboratory and was interpreted by two clinicians with expertise in identifying rhythm disturbance. Echocardiography to detect underlying heart disease was carried out using ALOKA SSD 4000 machine with a 2.5MHz probe. The transthoracic echocardiographic procedures were done in the left lateral decubitus position and measurements were based on the American College of Cardiology ACC guidelines. We used the CHADS2 score (Refer Appendix 1) to stratify the stroke risk and we evaluated the type of treatment patients received as documented in their clinical notes.

Statistical analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 21.0. Results are presented in tables and graphs and expressed as mean ± standard deviation for continuous variables and proportions or percentages for categorical variables. t-tests and chi-square tests were used when appropriate to compare continuous and categorical variables respectively. A P value of less than 0.05 was considered statistically significant.

Ethical Approval: This was a retrospective analysis and did not require ethical approval, as patients were not contacted. The data were blinded and stored in a password-protected computer. Only the investigators had access to the data.

RESULTS

Patients Demographics: Two hundred and twenty eight patients referred to the cardiology outpatient clinic for the first time were identified. Of these, sixty-eight patients had atrial fibrillation confirmed on ECG giving a prevalence rate of AF among general population referred for cardiology consultation of 29.8%
Table 1 shows the clinical characteristics of the patients with documented AF.

Treatment of Atrial Fibrillation: Review of the case notes showed that the AF was not classified in any of the patients. The main symptom recorded was palpitation and average duration of symptoms was 10.8 weeks (range 3-68 weeks).
Sixty-six patients received low dose [75mg] aspirin, 63 received digoxin, 6 received warfarin and four 4 received Amiodarone. Fifty-eight patients received digoxin and low dose Aspirin, 6 patients received a combination of low dose aspirin, digoxin and warfarin and four patients received digoxin and Amiodarone (Ref. table 2)

Analysis of Stroke Risk: Review of the clinical case notes showed none of the patients had documented stroke risk evaluation by the attending physicians. Retrospective analysis for Stroke risk using the CHADS2 score showed that 27 patients (39.71%) had intermediate risk for stroke (CHADS2 = 1) while 41 patients (60.29%) had high risk of stroke (CHADS2 $\geq$ 2) (Ref. table 3)

DISCUSSION

This study showed that males were more affected than females by AF. The mean age in this study was 59.81 years showing that atrial fibrillation occur in younger age groups in Nigerians generally compared with Caucasians in which the mean age in AF patients is higher than 70 [73.1]years (4). We opine that this is probably due to longer average life span, more than 60 years in most developed countries of Europe compared with less than 50 years in most African countries and better socioeconomic circumstances.

We found hypertensive heart disease, dilated cardiomyopathies and rheumatic heart disease as commonest associated cardiac conditions in individuals with atrial fibrillation. This is in keeping with similar findings from other parts of Nigeria, Senegal and Cameroun (5,6,7) and in contrast to findings among Caucasians in whom coronary artery disease, congestive heart failure and obesity predominate (3,4).

The CHADS2 score analysis carried out in the patients show that 60.3% of the patients had scores of 2 or more and had a high risk of stroke and is lower than found in Cameroonian patients 60.3% Vs 91.9% (7). The highest risk was found in those aged over 70 years amongst whom 89.5% had high risk of stroke. The analysis also showed increasing stroke risk with increasing age but this is not unexpected as stroke is generally commoner in the older age group.

The main aim of treatment in atrial fibrillation is to prevent the most severe known complications which is stroke and other thromboembolic phenomenon. Warfarin is the recommended drug of choice for thrombo prophylaxis in valvular and non-valvular AF while the newer agents are recommended for use only INR non-valvular AF (8,9,10,11). Our analysis of the treatment pattern however showed that whereas almost all the patients (94.11%) received anti platelet prophylaxis, only 8.8% received anticoagulation prophylaxis (warfarin) despite the majority being at sufficiently high risk for stroke. This low level of OAC use is much lower than the 34.2% reported from Cameroon, (7) 67% and 86% from the developed countries and 38% from Zimbabwe (12). This poor or low level use of OAC exposes the patients to avoidable thromboembolic events and we surmise that this may be due to knowledge gap in the use of guidelines for the management of cardiac diseases by physicians as well as the challenge posed by paucity of facilities for monitoring warfarin use in the hospital. The emergence of the novel oral anticoagulants may make physicians more likely to place patients on these agents as the need for lifestyle and diet modification as well as the need for frequent (often unavailable and expensive) INR monitoring related to warfarin therapy is obviated with their use. However the high cost of

these agents may further limit their use at the current time until cheaper generic forms become available.

Study limitations: We acknowledge that the retrospective nature of this study resulted in invariable missing data, which may have affected the quality of the analysis. In addition these patients were recruited from a cardiology clinic and thus the prevalence of AF and the treatment pattern may not represent the general population. However given that these rather inconclusive results were obtained from a teaching hospital, we surmise that it most likely underestimates the true magnitude of the problem.

CONCLUSION

The prevalence of atrial fibrillation among patients referred to general cardiology clinics is high. The etiology of atrial fibrillation in Port Harcourt is similar to findings in other African patients but the atrial fibrillation was not classified and stroke risk not evaluated in any of the patients' records assessed. A large proportion of patients had moderate or high risk of stroke. Adherence to and implementation of available treatment guidelines appears low and pose significant hindrance to good patient management and improvement in morbidity and mortality.

RECOMMENDATIONS

This study highlights the poor focus on AF despite its increasing prevalence among the cardiology population. it also highlights poor adherence to evidence based guidelines on stroke risk management. We therefore recommend the following:

1. More attention should be paid to the proper evaluation of patient presenting with AF.
2. Enhance uptake of the guidelines on AF management by physicians involved in the care of these patient.
3. Increased availability of INR monitoring.

Conflict of interest: The authors declare no conflict of interest.

REFERENCES

1. Benjamin EJ, Wolf PA, DAgostino RB, Sibbershatz H, Kannel WB, and Levy D. Impact of Atrial Fibrillation on risk of death: The Framingham heart study. Circulation 1998;98(10):946-52.
2. Kirchhof P, Auricchio A, Bax J, Crijins A, Camm J, Diener HC, et al. Outcome parameters for trials in atrial fibrillation; executive summary. Recommendation from a concensus conference organized by the German Atrial Fibrillation Competence Network (AFNET) and the European Heart Rhythm Association (EHRA). Eur Heart J 2007;28:2803-2817.
3. Lip GY, Golding DJ, Nazir M, Beavas DG, Child DL, Fletcher RI. A survey of Atrial fibrillation in general practice: The West Birmingham Atrial Fibrillation Project. Br J Gen Practice 1997;47: 28.
4. Thomas Cooke, Antje Groth, Sabrins Mueller, Mathias Pfannkuche, Frank Verheyen, Roland Linder, et al. Incidence and prevalence of Atrial Fibrillation: An analysis based on 8.3million patients. Europace 2013;15(4): 486-493.
5. Mbakwem AC, Ajuluchukwu JNA, Oke DA. Clinical, Electrocardiographic and Echocardiographic features of Atrial fibrillation in Nigerians: An Analysis of 39 patients seen at the University of Lagos Teaching Hospital. Nigerian Quarterly J Hosp Med 2002;12(1-4)29-33.
6. Massane Mbaye, Soulemane Pessinaa, Malick Bodian, Bamba N. Moutamadon, Faton Mbaye, Adama Kane et al. Atrial fibrillation, frequency, etiologic factors, evolution and treatment in a cardiology department in Dakar, Senegal. Pan Afr Med J 2010;6:16.
7. Marie Ntep-Gweth, Marc Zimmermann, Alexandre Meiltz, Samuel Kingue, Piere Ndobo, Philip Urban, ? et al. Atrial Fibrillation in Africa: Clinical Characteristics, Prognosis, and adherence to guidelinesin Cameroon. Europace 2010; 12: 482-487.
8. Friberg L, Hamman N, Ringh M, Petterson H, Rosenqvist M. Stroke prophylaxis in Atrial fibrillation: who gets it and who does not? Eur Heart J 2006;27:1954-64.
9. Lip GY, Edwards SJ. Stroke prevention with aspirin, warfarin and ximelagatran in patients

with non-valvular atrial fibrillation: a systematic review and meta-analysis. Thromb Res 2006; 118:321–33.

10. Hart RG, Pearce LA, Aguilar MI. Meta-analysis: antithrombotic therapy to prevent stroke in patients who have non valvular atrial fibrillation. Ann Intern Med 2007; 146: 857–67.
11. Mant J, Hobbs FD, Fletcher K, Roalfe A, Fitzmaurice D, Lip GY AND Murray E.. Warfarin versus aspirin for stroke prevention in an elderly community population with atrial fibrillation (the Birmingham Atrial Fibrillation Treatment of the Aged Study, BAFTA): a randomised controlled trial. Lancet 2007;370: 493–503.
12. Bhagat K, Tisocki K. Prescribing patterns for the use of antithrombotics in the management of atrial fibrillation in Zimbabwe. Cent Afr J Med 1999;45:287–90.

APPENDIX 1

CHADS2 SCORE SYSTEM

C= Congestive heart failure	Score of 1
H = Hypertension	Score of 1
A = Age >75yrs	Score of 1
D = Diabetes mellitus	Score of 1
S = Stroke or previous TIA	Score of 2

Score Stroke Risks		
0	=	low risk
1	=	intermediate risk
2 or more	=	high risk

Table 1 Baseline characteristics of the study population

Variable	**Patients with AF (n=68)**
Age years (mean ± SD)	59.81±14.22
Age range:	
30-49	17 (25)
50-69	32 (47.1)
70-89	19 (27.9)
Female n (%)	29 (42.6)
Presenting symptom (%)	
x Palpitations	60 (88.2)
x Dyspnea	3 (4.4)
x Light-headedness	5 (7.4)
Mean symptom duration (months)	10.8 ± 9.5
Systolic blood pressure (mmHg)	126.03± 26.89
Diastolic blood pressure (mmHg)	67.22± 18.60
Ejection fraction (%)	37.48 ± 8.79
Left atrial diameter (mm)	39.76± 7.49 (range 23.0-56.0)
Associated cardiac condition	
Hypertensive heart disease	40 (58.8)
Dilated cardiomyopathy	13 (19.2)
Rheumatic mitral valve disease	10 (14.7)
Thyrotoxic heart disease	3 (4.3)
Endomyocardial fibrosis	1 (1.5)
Cor pulmonale	1 (1.5)

Table 2: Treatment Pattern of atrial fibrillation

Treatment Offered	Number	Percent
Aspirin + Digoxin	58	85.29
Aspirin + Digoxin + Warfarin	6	8.83
Amiodarone	4	5.88
TOTAL	68	100.00

Table 3: Stroke Risk according to age

Age Range (Years)	n	CHADS2 SCORE		
		0	1 (Moderate risk)	≥2 (High risk)
30-49	17	-	11 (64.7)	6 (35.3)
50-69	32	-	14 (43.8)	18 (56.2)
70-89	19	-	2 (10.5)	17 (89.5)
TOTAL	68	0	27 (39.7)	41 (60.3)