PROSPECTIVE EVALUATION OF HOSPITALIZED PATIENTS WITH ATRIAL FIBRILLATION IN SENEGAL

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Abstract

Introduction: The purpose of this study was to determine the prevalence, complications and therapeutic strategy in the management of atrial fibrillation.

Patients and methods: This was a prospective, descriptive study conducted at the Cardiology Department of the Aristide Le Dantec University Hospital in Dakar, Senegal which included all patients with atrial fibrillation, admitted between September 2006 and June 2007. We studied the clinical, para-clinical variables as well as the therapeutic strategy adopted. For the comparison of parameters we used the student t-test with significant values considered when $p<0.05$.

Results: One hundred patients with atrial fibrillation were admitted during the study period giving a prevalence of 14.2% among admitted cases. The average age of our study cohort was 47.7±18.4years. In our study population, there was heart failure in 58%, stroke in 15%, left atrial thrombus in 2% and acute is chemia of the leftleg in one patient. Transthoracic echocardiography showed dilated left atrium in 61% of patients, left ventricular systolic dysfunction in 25 of patients and two cases of left intra-atrial thrombus. Valvular heart diseases was found in 53% of cases. Anticoagulation therapy with low molecular weight heparin and with vitamin K antagonist was given in 80% and 95% of patients respectively. Pharmacological cardioversion and direct current (DC) cardioversion were performed in 11% and 22% of patients respectively.

Conclusion: Atrial fibrillation was more prevalent in young adults with rheumatic valvular heart disease, with rate control the most commonly used therapeutic strategy. The findings justify the need for primary prevention.

Keywords:*Atrial fibrillation, epidemiology, evaluation, Dakar*

Introduction

Atrial fibrillation is the most common sustained cardiac arrhythmia encountered in clinical practice[1, 2]. It is a complete disorganization of atrial electrical activity and results in the loss of atrial systole. It is a serious disease mainly due to the frequently associated thrombo-embolic (including cerebral) complications[1.] In sub-Saharan Africa, rheumatic valvular heart diseases remain one of the main causes of atrial fibrillation, even though we now see a progressive increase in cases of ischemic heart diseases[3].

The aims of this study were to evaluate the prevalence of atrial fibrillation in a hospital setting, to determine the background in which it occurs, evaluate its tolerance and complications as well as to assess the treatment strategy in order to establish the most effective means to manage and prevent this disease.

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Conflictinterest: none declared

Patients and methods

This was a prospective descriptive study conducted at the Cardiology Department of Aristide Le Dantec University Hospital in Dakar, Senegal, between September 2006 and June 2007 including 100 consecutive admitted patients. Atrial fibrillation (AF) was considered paroxysmal when it terminated spontaneously in less than 7 days, persistent when sustained beyond 7 days and permanent when cardioversion failed or was not attempted[4]. Patients with atrial fibrillation seen at the outpatient department were not included in this study.

The evaluation was based on: 1) Patient's history including biographical data (age, gender), presenting medical complaints and past medical history 2) a full clinical examination 3) thyroid gland activity by hormone assay 4) a 12-lead electrocardiogram with a long lead II strip 5) a transthoracic echocardiography and 6) the therapeutic strategy adopted.

For the comparison of parameters we used the student t-test with significant values considered when $p<0.05$.

Results

During the specified study period, 705 patients were admitted out of which 150 were for arrhythmia. One hundred patients had AF representing a prevalence of 14.2%among admitted cases and

accounting for 66.7% of all arrhythmias. The average age of our study cohort was 47.7±18.4 years, with an age range of 16 to 86 years (Figure 1).

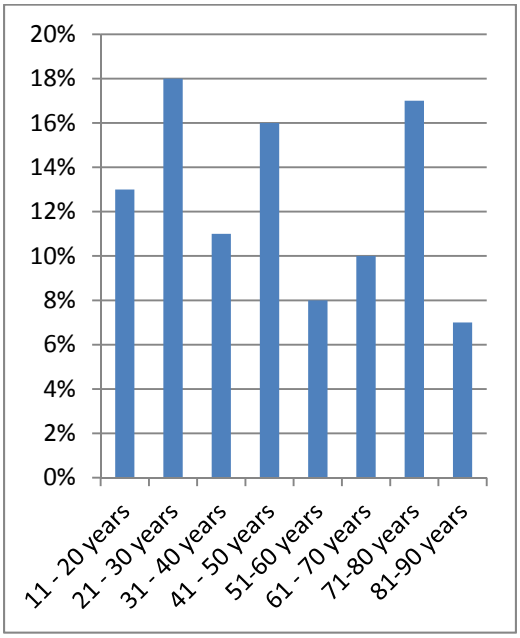

Figure 1: Distribution of patients according to age groups

Atrial fibrillation was not well tolerated (i.e. resulted in hemodynamic instability) in 13% of cases and was concomitant with heart failure in 58% of cases, with stroke in 15% of patients, with a left atrial thrombus in 2% of cases and with acute left leg ischemia in one patient.

In our study cohort, 31% had persistent atrial fibrillation and 69% had permanent atrial fibrillation. There was hyperthyroid activity in 3 patients.

The 12-lead electrocardiogram, with a long lead II strip, found 96 cases of atrial fibrillation with fine, low amplitude fibrillatory waves, and 6 cases of coarse atrial fibrillation. The average ventricular rate was 116.4 ± 28.6 cycles per min, with extremes ranging from 60 to 190 cycles per minute. Other electrocardiographic abnormalities are summarized in Table 1.

Table 1: Electrocardiographic anomalies

Electrocardiographic anomalies	Percentages
Leftventricularhypertrophy	38%
Right ventricularhypertrophy	15%
Bi-ventricularhypertrophy	7%
Right bundle branch block	5%
Left bundle branch block	1%
Repolarisation disorder	11%
Conduction aberration	9%
Low voltage	5%

Transthoracic echocardiography showed a dilated left atrium in 61% of patients, an impaired left ventricular systolic function in 25% of patients and 2%of left intra-atrial thrombus.We found valvularheart diseases in 53% of patients; including 20.7% of mitral stenosis, 26.4% of isolated mitral valve disease and 52.8% of multiple valvular affections. Other associated heart diseases found are shown in Figure 2. Trans-esophageal echocardiography performed in 4 patients found a left atrial spontaneous contrast in 2 of them.

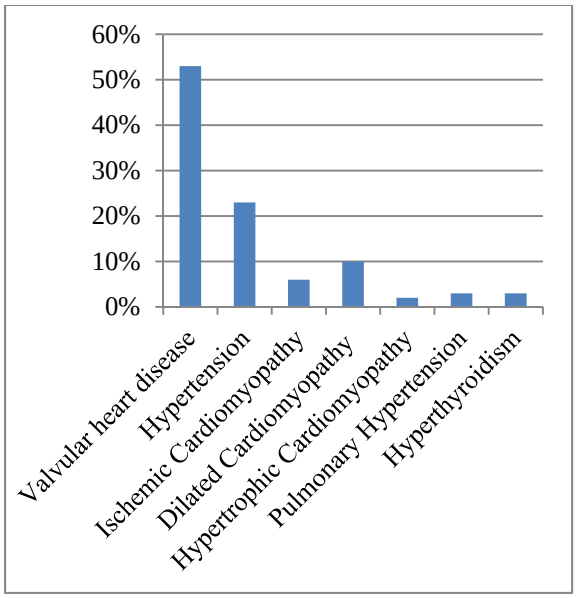

Figure 2: Associated heart diseases found in the study cohort

An anticoagulation therapy with low molecular weight heparin and vitamin K antagonist was given in 80% and 95% of patients respectively. Pharmacological cardioversion(Table 2) or DC cardioversion was performed in 13% and 22% of patients respectively. In 65% of patients no attempt to re-sinusalize was performed. These patients had received a heart rate-reducing treatment based on oral digoxin in 59% of cases, and beta-blockers in 6 patients.

In twenty six patients the atrial fibrillation became sinus, including 22 by DC cardioversion, 3 with amiodarone and 1 patient with sotalol. Recurrence of arrhythmia was observed in 4 patients who all had very dilated left atria. There was a mortality rate of 6%.

Discussion

Atrial fibrillation (AF) is a public health problem because of its high prevalence rate and the severity of its complications, especially embolic, since on average, the risk of stroke increases by 5-fold compared to a population in sinus rhythm and by 17-fold in the presence of rheumatic valve disease[1].

Table 2: Characteristics of patients who received pharmacological cardioversion

No.	Sex	Age (yrs)	Underlyingcardiacdisorder	Left atrial diameter (mm)	Anti-arrhythmic	Outcome
1	M	60	Cor pulmonale	45	Amiodarone (p.o)	Failure
2	F	40	Mitral disease, Tricuspidincompetence	36	Amiodarone (p.o)	Failure
3	F	79	Hypertension	-	Amiodarone (p.o)	Failure
4	M	60	DCM	47	Amiodarone (IV)	Success
5	F	77	Hypertension	-	Amiodarone (p.o)	Failure
6	F	75	Hypertension	40	Amiodarone (p.o)	Success
7	F	40	Mitral stenosis	42	Amiodarone (p.o)	Failure
8	F	36	MD, AI, TI	58	Amiodarone (p.o)	Success
9	M	75	DCM	46	Amiodarone (p.o)	Failure
10	F	75	Ischemicheartdisease	40	Sotalex (p.o)	Success
11	F	55	Hypertension	34	Amiodarone (p.o)	Failure
12	M	73	DCM	49	Amiodarone (p.o)	Failure
13	F	74	DCM	32	Amiodarone (p.o)	Failure

Abbreviations: M: male; F: female; MD: mitral disease; AI: aortic insufficiency; TI: tricuspid insufficiency; DCM: dilated cardiomyopathy; p.o: oral; IV: intravenous

In this study population, the hospital prevalence of atrial fibrillation was 14.2% representing 66.7% of arrhythmias thus making it the most frequently encountered arrhythmia in patients hospitalized at the Cardiology Department of Aristide Le Dantec University Hospital. This predominance of atrial fibrillation in people hospitalized for cardiac arrhythmia was emphasized in the work of Ciaroniet etal (2000) with a reported prevalence of 40%[2]and also in the retrospective study by Wen-Hang in China[5].

In the general population, the prevalence of atrial fibrillation is variable and highly dependent on age. It is less than 1% in patients younger than 60 years and about 6% in those over 80 years of age[6, 7]. In the currentstudy, the average age of patients was 47.7 ± 18.4 years, with ranges between 16 and 86 years. The majority of our patients were young adults. These results contrast with those found in the ALFA study with a mean age of 66.5 years for males and 71.4 years for females[8].

In a study by Ellengaet al in Brazzaville[3], the average age of patients with atrial fibrillation was 59.3 ± 18 and ranged from 16 to 93 years[3]. This difference results from the predominance of rheumatic valvular disease as etiology of atrial fibrillation in our region. In our study, contrary to what is in the literature, the underlying heart diseases were mainly represented by valvular (53%), followed by hypertensive heart disease (23%), dilated cardiomyopathy (10%) and ischemic heart disease (6%). This is due to the high incidence of rheumatic heart diseases in Senegal. This also contrasts with the AFIB Cameroon Study, in which the main underlying heart disease was hypertension (64.5%). However 25.6% had a rheumatic mitral valve disease[9].

The occurrence of atrial fibrillation is a turning point in the evolutionary path of the natural history of patients with rheumatic valve diseases. It potentiates thereby the risk of embolism, the morbidity and mortality of these diseases. In the ALFA study, 71% of patients had an underlying heart disease with hypertensive heart disease, representing 21% of likely causes of atrial fibrillation. The other underlying heart diseases were mainly coronary heart disease in 17%, valvular disease in 15%, dilated cardiomyopathy in 9% and hypertrophic cardiomyopathy in 5% [8].

In our study, a large number of patients received anticoagulant treatment compared to that found in the AFIB Cameroon study[9] in which only 34.2% of eligible patients received oral anticoagulation.

Rate control was the most frequently observed therapeutic approach in this study corresponding to echocardiographic findings of a dilated left atrium in 61% of patients. A Similar strategy was also

observed in the AFIB Cameroon study[9]. However, the size of the left atrium should not be a barrier to cardioversion with the exception of values greater than 60mm[10]. Indeed Paziaudet al[11] included patients with left atrial diameter less than 60mm, which was not a discriminative parameter in the success of electrical cardioversion[11]. Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) and RAte Control versus Electrical cardioversion for persistent atrial fibrillation (RACE) studies report similar findings as per our therapeutic approach by showing that the rhythm control versus rate control does not improve the prognosis of patients with atrial fibrillation[12, 13].

Conclusion

Atrial fibrillation constitutes the most frequently encountered arrhythmia in hospitals. In sub-Saharan Africa, it predominates in young adults with rheumatic valvular heart disease and potentiates morbidity and mortality of these diseases. Heart rate control is the most frequently seen therapeutic approach due to cardiac chamber sizes in general and to left atrial diameter in particular.

These findings justify the need for primary prevention but also for early secondary surgical treatment of rheumatic valve disease.

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