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Non-valvular atrial fibrillation in Morocco: epidemiological profile and management

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Abstract

Introduction: Atrial fibrillation is the most commonly encountered arrhythmia in cardiological practice, its predominant form in developed countries is non-valvular atrial fibrillation which constantly increasing even in developing countries, further its thromboembolic complications this arrhythmias is associated with a higher risk of mortality, heart failure, and hospitalization.

The aim of this work is to study the epidemiological profile of non-valvular AF in Morocco, to evaluate the therapeutic management and to investigate the part of the different risk factors for embolic events in our local context.

Materials and methods: an observational study including 250 patients admitted for non-valvular atrial fibrillation was conducted in the cardiology department of the military training hospital Mohammed V in Morocco, all patients underwent electrocardiogram, echocardiography and biological determination of thyroid hormones and renal function their clinical characteristics as well as echocardiographic and therapeutic data were collected and analyzed.

Results: The mean age of our patients was 63 years (+/- 12) with a sex ratio H / F of 2.1. Atrial fibrillation was permanent in 66% of patients, paroxysmal in 23% and persistent in 11% of cases. The mean diameter of the left atrium was 44 mm (+/- 7) with a mean surface area of 25 cm2 (+/- 7), the average ejection fraction was 52% (+/- 13). The most common symptoms were palpitations, dyspnoea and systemic embolism. The average CHA2DS2Vasc score was of 2.57, only 58% of our patients were on VKA at admission. Among the different embolic risk factors studied, only age diabetes and hypertension were significantly associated with the occurrence of a thromboembolic accident in our study. A strategy of rhythm control was adopted in 75 patients: 45 patients underwent cardioversion and 30 other underwent pulmonary veins isolation.

Conclusion: the epidemiological profile and clinical features of non-valvular atrial fibrillation are different in our local context, an under-utilization of anticoagulant therapy in eligible patients is noted as well as a less frequent use of a rhythm control strategy compared to a rate control strategy.

Keywords: non-valvular atrial fibrillation, epidemiological profile, management, Morocco

Introduction

Atrial fibrillation (AF) is the most commonly encountered cardiac arrhythmia, its prevalence is increasing with the aging of the population [1], it is seen in 1% of the population under 60, but approaches 10% in those over 80 years of age [2]. In addition to its thromboembolic complications, AF is associated with a higher risk of mortality [3], heart failure, hospitalization and a more impaired quality of life with reduced ability to exercise [4]. Remarkable advances in the understanding of the pathophysiology of AF associated with therapeutic progress in its rhythmic and thrombo-embolic aspects make it a topical subject.

The aim of this work is to study the epidemiological profile of non-valvular AF in Morocco, to evaluate the therapeutic management and to investigate the part of the different risk factors for embolic events in our local context.

Material and methods

We performed a 4-year observational study, including 250 patients admitted for non-valvular AF in the Cardiology department of the Mohammed V Military Teaching Hospital. All patients admitted to the hospital and presenting a paroxysmal persistent or permanent AF were included and underwent a full clinical examination, an electrocardiogram at admission and discharge, and a biological assessment that includes fasting glucose, kidney function and thyroid hormone testing. A transthoracic echocardiography was performed in the first 48 hours of hospitalization. The echocardiographic analysis specified in particular the ejection fraction of the left ventricle, the diameter and the area of the left atrium. The analysis focused on the clinical aspects of in-hospital AF as well as on the therapeutic means implemented especially antiarrhythmics and antithrombotics therapies. Some data

have been statistically analyzed using SPSS 13.0 software.

Results

During this inclusion period we collected 250 patients with non-valvular AF from a total of 610 patients with AF, which represents 40% of all our patients. The mean age of nonvalvular AF patients was 63 years (+/- 12) with a sex ratio H / F of 2.1. AF was permanent in 66% of patients, paroxysmal in 23% and persistent in 11% of cases. The mean diameter of the left atrium was 44 mm (+/- 7) with a mean surface area of 25 cm2 (+/- 7), the average ejection fraction was 52% (+/- 13). The most common symptoms were palpitations, dyspnoea and systemic embolism. Table 1 summarizes the clinical characteristics and echocardiographic findings of the patients.

Table 1: Characteristics and echocardiographic findings of patients with non-valvular AF (N 250)

Mean age (years)	**63 (+/- 12)**
Sex ratio M/W	2.1
AF presentation	
* Paroxysmal	23%
* Persistent	11%
* Permanent	66%
Symptoms	
*Palpitation	69%
*Dyspnoea	37%
*Embolic event	8.1%
echocardiographic findings	
*Diamètre OG	44 (+/- 7)
* Surface OD	25 cm² (+/- 7)
* FEVG	52%(+/- 3)
VKA at admission	58%

The most common cardiovascular risk factors associated with AF were hypertension 51% of patients, diabetes 31%, smoking 28% and chronic kidney disease 25%, defined by a creatinine clearance of less than 60 ml / min. The main etiologies of AF in our study were: hypertensive heart disease (35%), coronary heart disease (24%), dilated cardiomyopathies (20%) and hyperthyroidism (5%). 8.1% of patients had systemic embolism. The median CH2ADS2 Vasc score for nonvalvular AF patients was 2 [1, 4], with an average of 2.57. Only 58% of these patients were on VKA at admission. Figure I show the distribution of patients according to their CHA2DS2 Vasc scores.

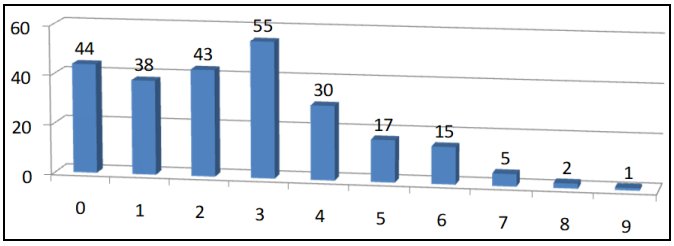

Fig 1: Distribution of patients according to their CHA2DS2 Vasc scores

Among the various factors studied, those statistically associated with the risk of systemic embolism, in a univariate analysis, were: age> 75 years or between 65 and 75, hypertension, diabetes and CKD. In a multivariate analysis only age, hypertension, and diabetes remains significantly associated with stroke risk. Table 2 shows the association between different risk factors and the occurrence of embolism. A rhythm control strategy was adopted in 75 patients, which represents 30% of our population. 45 patients underwent cardioversion, mainly electrical, and 30 other underwent pulmonary veins isolation by cryoablation. The primary success rate was 75% and 80% respectively.

Table 2: Risk Factors Associated with Embolism in Nonvalvular AF: Multivariate Analysis

	OR	**CI (95%)**	**P**
Age			
<65 ans	1		
65-75ans	1.8	[1.3-2. 2]	0.026
>75 ans	3	[1.9-4.2]	0.01
Sex	0.8	[0.4 -2]	0.7
Hypertention	2.1	[1.5-3.2]	0,02
Diabetes	1.8	[1.2-3.1]	0.01
Left atrium diameter	1.03	[0.3-1.1]	0.3
Left atrium surface area	1.04	[0.3-1.1]	0.1
Left ventricule ejection fraction	0.98	[0.8-1.05]	0.6
Coronary heart disease	1.4	[0.5-4]	0.46
CKD	1.5	[0.9-2.8]	0.07

OR: odds Ratio, CI: confidence interval

Discussion

Atrial fibrillation is the most common cardiac rhythm disorder; its incidence and prevalence are higher in developed countries with mostly non-valvular forms, compared to the developing country where valvular- AF still keeps a high prevalence [5].

Our patients with non-valvular AF accounted for 40% of all AFs encountered during inclusion, different results were reported in a Cameroonian study [6] where the portion of non-valvular AF approached 75% mainly of hypertensive origin, this difference could be explained by the high prevalence as well as the severity of blood hypertension in black Africa. The average age of our population was 63 years (+/- 12) with a male predominance. A Senegalese study [7] found a comparable mean age of 67 years (+/- 13) on a sample of 118 cases. AF was permanent in 66% of patients, paroxysmal in 23% and persistent in 11% of cases, different results were reported by the Senegalese study [7] with a higher prevalence of permanent AF (83.05%) compared to paroxysmal and persistent forms which accounted for only 11.02% and 5.93% respectively.

The most common etiologies of non-valvular atrial fibrillation are hypertensive heart disease, coronary artery disease, hypertrophic cardiomyopathies, dilated cardiomyopathies, and congenital heart disease. The predominant cause in our study was hypertensive heart disease followed by coronary artery disease, and dilated cardiomyopathies, the same finding was reported in the ALPHA [8] study conducted in a French population. Extracardiac causes are rare, especially the hyperthyroidism found in 5% of our patients. The average diameter of the left atrium was 44mm (+ / - 7) with an average surface area of 25 cm2 (+/- 7), this dilatation was less than

that reported by Dittrich *et al*. with an average diameter of the left atrium of 47mm (+/- 8) [9].

Thus the characteristics of our population show a different profile compared to the European and African population, hence the interest of conducting such a study in our own context.

Atrial fibrillation increases the risk of stroke and systemic embolism by approximately 5-fold [10], but this risk is not homogeneous and varies according to the risk factors of the patient [11].

We used the CHADS2 Vasc score to stratify the embolic risk of our patients the median of this score was 2 with a mean of 2.6, in a Cameroonian [6] and a Switzerland [12] studies the classic CHADS2 score was used the mean score was 1.9 and 1.4 respectively. The association of certain parameters of the CHA2DS2Vasc score with the occurrence of embolism was tested in our study, in a multivariate model only the age groups greater than 75 years and between 65 and 75 years, hypertension and diabetes were significantly associated with the risk of systemic embolism including ischemic stroke.

The left atrium enlargement, evaluated by diameter and surface area, was not associated with the risk of embolism in our study. Whether the left atrium dilatation is associated with embolic risk or not remains controversial in the literature [13-18]. The lack of detection of a significant association for the other parameters reported in the literature [19, 20] and incorporated into the CHA2DS2 Vasc score [21] can be explained by the sample size and the retrospective nature which represents a limit of our study.

Only 58% of our non-valvular AF patients eligible for anticoagulant therapy were on VKA at admission, with a higher rate of 67% of patients reported in a European registry. [22].

While the European registries show an increase in the adoption of a rhythm control strategy at the expense of the rate control strategy [23] only 45 of our patients have undergone cardioversion and 30 other patients an attempt to pulmonary veins isolation by cryoablation, this low number can be explained on the one hand by the development at its beginning of the ablative techniques in our context, and on the other hand by the predominance of the permanent forms of AF, hence the need for more screening of early AF forms which better respond to rhythm control strategies. The restoration of a sinus rhythm was obtained in 75% of our patients who underwent electrical or pharmacological cardioversion, the primary success rate reported in the literature varies between 70-90%, the electrical cardioversion has been more effective than pharmacological one, the same finding has been reported in a Polish registry [24].

Conclusion

The epidemiological profile and clinical features of non-valvular atrial fibrillation are different in our Maghrebian context compared to the populations of Europe and sub-Saharan Africa, an under-utilization of anticoagulant treatment in eligible patients is noted as well as a less frequent use of a rhythm control strategy compared to a rate control strategy.

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