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Epidemiological Profile and Management of Non-Valvular Atrial Fibrillation: A Study in a Tertiary Care Hospital, Rajshhi, Bangladesh

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Abstract **Original Research Article**

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 study was to assess the epidemiological profile of non-valvular atrial fibrillation (AF) in Bangladesh, to evaluate the therapeutic management and to investigate the part of the different risk factors for embolic events in our local context. This was an observational study on 163 patients admitted for non-valvular atrial fibrillation was conducted in the department of cardiology, Rajshahi medical college hospital during the period from January 2017 to December 2018. 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. The mean age of our patients was 62±11 years with a male female ratio of 1.96:1. Atrial fibrillation was permanent in 63% of patients, paroxysmal in 23% and persistent in 11% of cases. The mean diameter of the left atrium was 44±8 mm with a mean surface area of 25±7 cm^2, the average ejection fraction was 51±12%. The most common symptoms were palpitations, dyspnoea and systemic embolism. The average CHA2DS2Vasc score was of 2.49. 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. 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. As it was a single centered study with a small sized sample so the findings may not reflect the exact scenario of the whole country.

Keywords: Non-valvular, Atrial Fibrillation, Epidemiological, Bangladesh.

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 prevalence of atrial fibrillation increases with age, affecting 3.8% of the U.S. population over 60 years of age and 9.0% of the population older than 80 years. Over the past two decades, hospitalizations for atrial fibrillation in the United States have increased by a factor of two to three, resulting in a substantial public health burden [5]. Despite advances in nonpharmacologic therapy, many symptomatic patients receive medical treatment for rhythm control. Currently available antiarrhythmic agents are limited by either their modest efficacy or their potential for serious ventricular proarrhythmia or extracardiac toxic effects. Furthermore, no currently available antiarrhythmic treatment has been shown to reduce the rate of hospitalization due to cardiovascular events in patients with atrial fibrillation. The aim of this work is to study the epidemiological profile of non-valvular AF, 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 year's observational study, including 163 patients admitted for non-valvular AF in *in the department of cardiology, Rajshahi medical college hospital during the period from January 2017 to December 2018*. Although we had started with 200 patients but after maintaining the proper inclusion and exclusion criteria finally 163 patients were fixed as the study population. Severely ill and assault cases were rejected at the first step of selection. We found full data from all the participants. 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 anti-thrombotics therapies. Some data have been statistically analyzed using SPSS 20 version software.

RESULTS

During this inclusion period we collected 163 patients with non-valvular AF from a total of 200 patients with AF. It was 81.5% out of all our primary patients. The mean age of nonvalvular AF patients was 62±11 years with male-female ratio of 1.96:1. AF was permanent in 61.96% of patients, paroxysmal in 20.86% and persistent in 17.18% of cases. The mean diameter of the left atrium was 44±8 with a mean surface area of 25±7 cm^2, the average ejection fraction was 51±12%. The most common symptoms were palpitations, dyspnoea and systemic embolism. Table-1 summarizes the clinical characteristics and echocardiographic findings of the patients. In Figure-1 the ratio of CHA2DS2 Vasc scores was displayed. The score was 0 in 18.40%, 1 in 15.34%, 2 in 16.56%, 3 in 21.47%, 4 in 12.27% 5 in 6.75%, 6 in 6.13%, 7 in 1.84% 8 in 0.61% and 9 in 0.61% found respectively. The most common cardiovascular risk factors associated with AF were hypertension 48.47% of patients, diabetes 33.13%, smoking 31.29% and chronic kidney disease 26.99%, defined by a creatinine clearance of less than 60 ml / min. The main etiologies of AF in our study were: hypertensive heart disease 36.20%, coronary heart disease 23.31, dilated cardiomyopathies 17.79% and hyperthyroidism 6.13%. In total 8.1% of patients had systemic embolism. The median CH2ADS2 Vasc score for nonvalvular AF patients was 2 [1], with an average of 2.57. Only 58% of these patients were on VKA at admission. Fig.-1 show the distribution of patients according to their CHA2DS2 Vasc scores.

Table-1: Characteristics and echocardiographic findings of participants (N 163)

Components	n	%
Mean age (years)	163	62±11
Sex ratio M/W	163	1.96:1
AF presentation		
Paroxysmal	34	20.86
Persistent	28	17.18
Permanent	101	61.96
Symptoms		
Palpitation	116	71.17
Dyspnoea	68	41.72
Embolic event	11	6.75
Echocardiographic findings		
Diameter OG (Mean)	163	44±8
Surface OD (Mean)	163	25±7
Mean EF	163	51±12

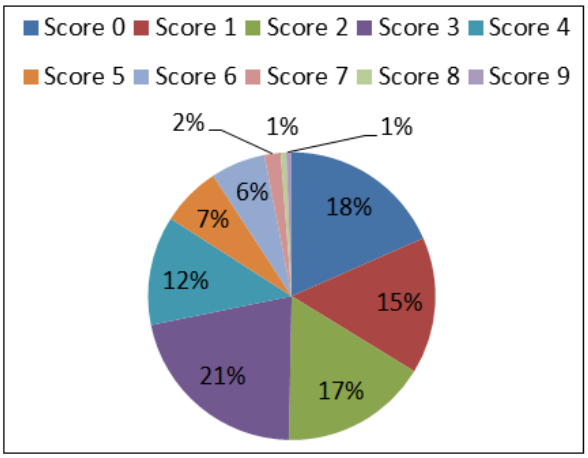

Fig-1: Ratio of CHA2DS2 Vasc scores among participants (N=163)

Table-2: Risk factors and Etiologies of AF among Participants (N=163)

Component	n	%
Risk Factors of AF		
Hypertension	79	48.47
Diabetes	54	33.13
Smoking	51	31.29
Chronic kidney disease	44	26.99
Etiologies of AF		
Hypertensive heart disease	59	36.20
Coronary heart disease	38	23.31
Dilated cardiomyopathies	29	17.79
Hyperthyroidism	10	6.13
Systemic embolism	15	9.20

DISCUSSION

Most patients presenting with AF are not critically ill. However, in some cases, the presence of AF may cause life-threatening hemodynamic compromise. It should be emphasized that for any

unstable patient presenting with AF—for example, a patient with chest pain, pulmonary edema, or hypotension—the recommended therapy is rapid electrical cardioversion, according to the Advance Cardiovascular Life Support guidelines [6]. 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 [7]. Our patients with non-valvular AF accounted for 81.5% of all AFs encountered during inclusion, different results were reported in a Cameroonian study [8] 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 62±11 years with a male predominance. A Senegalese study [9] found a comparable mean age of 67 years (+/- 13) on a sample of 118 cases. AF was permanent in 61.96% of patients, paroxysmal in 20.86% and persistent in 17.18% of cases, different results were reported by the Senegalese study[9]. 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 [10] 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 44±8 mm with an average surface area of 25±7 cm^2. This dilatation was less than that reported by Dittrich et al. with an average diameter of the left atrium of 47mm (+/- 8) [11]. 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 [12], but this risk is not homogeneous and varies according to the risk factors of the patient [13]. 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 [14]. The lack of detection of a significant association for the other parameters reported in the literature and incorporated into the CHA2DS2 Vasc score [15] can be explained by the sample size and the retrospective nature which represents a limit of our study. More than 50% 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 [16]. While the European registries show an increase in the adoption of a rhythm control strategy at the expense of the rate control strategy [17] 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. So we think our intervention was partially successful to gain some potential information about AF.

CONCLUSION

All the information gained from the study may be helpful for further studies and for the academicians and treatment professionals. But as it was a single centered study with a small sized sample so the findings may not reflect the exact scenario of the whole country. So we would like to recommend for conducting more studies in several places with some larger sample sizes to know more about AF.

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