EPIDEMIOLOGY AND CLINICAL PRESENTATION OF PATIENTS WITH ATRIAL FIBRILLATION FROM A TERTIARY CARE HOSPITAL OF EAST SIKKIM: AN OBSERVATIONAL STUDY

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ABSTRACT: OBJECTIVES: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia encountered in clinical practice. It is a common arrhythmia and major cause of morbidity and mortality not only in the western world but in India as well. This study was conducted to find the epidemiology and clinical profile of AF patients in Sikkim. Sikkim is a small north eastern Himalayan state. Ethnicity and culture of the people is quite different from rest of India. There are various studies conducted worldwide but there is paucity of data in this region.

METHODS: This observational hospital based study was carried amongst indoor and outdoor patients of AF of Department of Medicine, SMIMS, Gangtok. The diagnosis of AF was made on the basis of history, clinical examination, confirmation with 12 leads ECG and 2-DEchocardiography. Data analysis was done using micro-soft excel. Results are presented using percentages. **RESULTS:** Out of 51 patients of AF studied, majority of patients were aged between 71-80 years (33.33%). There were more males (54.90%) as compared to females. Structural heart disease was found in 86.26% of cases and non-structural heart disease in 13.72%. Among the structural heart disease, HTN with or without DM was seen in 50.98% cases as a cause of AF while among the non structural heart disease chronic obstructive airway (9.80 %) and thyrotoxicosis (3.92%) were most important causes. RHD was more prevalent in females (9.80%). In our study HTN was the most common etiological factor since most of our patients were in age group 61-80 yrs in which HTN is commonly seen. Dyspnea on exertion (DOE) (39.22%) was the most common presenting complaint encountered followed by palpitation (22.53%) and stroke (17.65%). Most common etiology of AF was HTN (55.55%) in patients who presented as stroke. Majority of the patients were from east district (70.58%) followed by west district (13.72%). Highest population of east district could have attributed to this. Prevalence of AF was highest in Nepalese community (68.62%) followed by bhutias (21.56%) (Table5). HTN as a risk factor was most prevalent in Nepalese (37.25%) and was

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a most common etiological factor in all these communities. **CONCLUSIONS:** This study has provided many insights on epidemiology and various presenting features of patients with AF. We have found few differences in epidemiology of AF in our studies compared to many Indian studies. In our study, majority of the patients (66.66%) were >60 yrs of age and most common etiological factor of AF was HTN followed by RHD and cardiomyopathies in contrast to most other Indian studies where presentation was more common in younger age and RHD was the most common etiology. Stroke as presenting feature was found in 17.65% patients and most common etiology of AF in these patients was HTN. This study has also discussed ethnic aspect of atrial fibrillation in this region. Most of our patients were Nepalese from ethnic point of view. This study would help in early diagnosis and prompt treatment of patients with AF especially in remote areas which remains a challenging problem. More detailed epidemiologic studies are required to improve understanding of the burden of AF and stroke in this region.

INTRODUCTION: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia encountered in clinical practice and requiring treatment. (1) It is characterized by irregular, disorganized and chaotic electrical activity of the atrium. It is a common arrhythmia and major cause of morbidity and mortality not only in the western world but in India as well. Its importance as a factor determining mortality, which it increases by 2-fold, and its relevance as a causative factor of stroke, the risk for which it increases by 5-fold, are incontrovertible and concordant in the various publications.(2) It is an independent risk factor for death with a risk ratio of 1.5 for men and 1.9 for women.(3) Rheumatic valvular heart disease (RHD) continues to remain the most frequent cause of AF in a recent survey in public and private institutes in India, however as our population is aging many patients with AF have associated hypertension (HT) and ischemic heart disease (IHD).(4) In Western countries, IHD is the commonest cause of AF.(5) Diagnosis of AF is based on rapid fibrillatory waves with changing morphology and ventricular rhythm that is irregularly irregular.(6) This is clinically identified as irregularly irregular pulse with rates varying from normal to 200 and pulse deficit >10 beats. Atrial fibrillation has been classified by American Heart Association/ American college of cardiology/European Society of cardiology into first detected episode, recurrent (two or more episode), paroxysmal (terminates within 7 days), persistent (persist) for more than 7 days) and permanent (sustained for more than 1 year or has failed cardio version). (7).

Figure 1. Patterns of atrial fibrillation: [1] episodes that generally last less than or equal to 7 days (most less than 24 h).[2] usually more than 7 days. [3] Cardioversion failed or not attempted; and [4] either paroxysmal or persistent AF, may be recurrent (Fuster et al 2001). (8)

The overall prevalence of AF in general population is estimated to be 0.4% to 1%. (7) The incidence of AF is 0.1% per year in the population below forty years and this increases to 2% in those over 80 years.(9) The incidence and prevalence of atrial fibrillation increases exponentially with aging.(10) The adjusted incidence and prevalence of AF is roughly double for each advancing decade of life (11) and at any given age, men have an $\approx 50\%$ higher incidence of AF than women.(10) Based solely on the aging of the population, the prevalence of AF in the united states has been projected to increase from ≈ 2 to 5 million in 2000 to ≈ 6 to 12 million in 2050, with estimates reaching almost 16 million if the increase in age-adjusted AF incidence continues.(12) From the Framingham data the lifetime risk of developing atrial fibrillation after age of 40 has been found to be 26% for men and 23% for women. Diabetes, hypertension, congestive heart failure and valvular heart disease are significantly associated with risk for atrial fibrillation in both sexes. Myocardial infarction is significantly associated with the development of atrial fibrillation in men. Women are significantly more likely than men to have valvular heart disease as a risk factor for atrial fibrillation. In addition to intrinsic cardiac causes such as valve disease and congestive heart failure, risk factors for cardiovascular disease also predispose to atrial fibrillation. Diabetes mellitus also increases risk of AF .Various mechanism of the same is autonomic remodeling, electrical remodeling ,structural remodelling and insulin resistance.(13) Race and genetic variants have been suggested a novel susceptibility factor for developing AF.(14)Modification of risk factors for cardiovascular disease may have the added benefit of diminishing the incidence of atrial fibrillation.(11) About 30% of people with AF have no symptoms but some people can experience a combination of the symptoms like palpitation, Shortness of breath, Lethargy, Dizzy spells or fainting, Chest pain and symptoms of stroke. AF predisposes patients to the development of thrombi and a markedly increased risk of ischaemic stroke .(15) Cerebrovascular complications are important cause of functional limitation of such patients. AF increases stroke risk fivefold. The clinical features that predict higher risk of stroke in AF are prior stroke, hypertension, advancing age, diabetes, and congestive heart failure. Predicting which patients with atrial fibrillation are at the highest risk of stroke remains challenges. (16) Mortality rate of stroke related to AF is twice as high as that of stroke unrelated to AF.(17) In patients 65 years or older, opportunistic screening by pulse palpation, followed by an ECG in those with an irregular pulse, is important to detect AF prior to the first stroke.(18)

Sikkim is a small multi-ethnic north eastern Indian state. The Nepalese comprise over 70 percent of Sikkim's population followed by Bhutias and Lepchas. Sikkim is divided into four districts, east district being the most populated. On the other hand, north district is least populated. (19) Most published epidemiologic studies focus on predominantly white populations in North America or Europe, and information on AF in non white populations is scarce.(20). There is paucity of data in this region, hence this study was undertaken with the aim to find epidemiology and clinical presentation of AF patients from a remote area of north east India.

MATERIALS AND METHODS: This observational hospital based study was carried out in the department of medicine, Sikkim, Manipal institute of medical sciences and central referral hospital (SMIMS & CRH), Gangtok from March 2012 to march 2013. All indoor and outdoor patients presented with AF having clinical and electrocardiographic evidence of AF were included in this

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study. The diagnosis of AF was made on the basis of history, clinical examination, confirmation with 12 leads ECG and 2D echocardiography. Routine hemogram, urine analysis, renal and liver function tests were done in all cases. Serum T3, T4 and TSH and prothrombin time with INR were estimated in selected patients.

Data analysis was done using micro-soft excel. Results were presented using percentages.

OBSERVATIONS

Observations are presented in tables.

Table 1. Table showing age wise distribution of patients.

Age in years	No. of Patients	(%)
20-30	1	1.96
31-40	1	1.96
41-50	7	13.73
51-60	8	15.68
61-70	12	23.53
71-80	17	33.33
81-90	5	9.80

Table 2. Table showing gender wise distribution of patients.

Sex	Male	Female
No of patients	28	23
%	54.90	45.09

Table 3. Table showing etiology of patients with AF.

Clinical Presentation	No. of patients	(%)
HTN with or without DM	26	50.98
RHD	7	13.72
Cardiomyopathy	7	13.72
Chronic airway Disease	5	9.80
IHD	3	5.88
Thyrotoxicosis	2	3.92
Diabetes Mellitus	1	1.96

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Table 4. Table showing clinical presentation of the patients with AF.

Signs and Symptoms	Patients	(%)
Dyspnoea	20	39.22
Palpitation	12	23.53
CVA	09	17.65
Chest pain	02	3.92
Dizziness	01	1.96
Others	07	13.76

Table 4. Table showing prevalence of AF in various ethnic groups.

Ethnic group	No. of patients	(%)
Nepalese	35	68.62
Bhutia	11	21.56
Lepcha	4	7.84
Others	1	1.96

Table 5. Table showing etiology of AF in various ethnic groups.

Ethnic group	HTN with or without DM	RHD	Cardio - myopathy	COPD	IHD	Hyper - thyroidism	DM
Nepalese	19(37.25%)	3(5.88%)	7(13.72%)	2(3.92%)	2(3.92%)	1(1.96%)	1
Bhutias	4(7.84%)	2(3.92%)		3(5.88%)	1(1.96%)	1(1.96%)	
Lepcha	3(5.88%)	1(1.96%)					
Others		1(1.96%)					

Table 6. Table showing district wise distribution of AF.

District	East	West	North	South
%wise distribution	70.58%	13.72%	7.84%	7.84%

DISCUSSION: Out of 51 patients of AF studied, majority of patients were aged between 71-80 years (33.33%) (Table1). This finding is consistent with some western studies (21, 22). There were more males (54.90%) as compared to females (Table2) which has been shown in various studies (22, 23). Structural heart disease was found in 86.26% of cases and non-structural heart disease in 13.72%. Among the structural heart disease, HTN with or without DM was seen in 50.98% cases as a cause of AF while among the non structural heart disease chronic obstructive airway (9.80 %) and thyrotoxicosis (3.92%) were most important causes found (Table 3). RHD was more prevalent in females (9.80%). Various Indian studies have shown RHD as the most common etiological factor for AF in India (4) but in our study HTN was the most common etiological factor since most of our patients were in age group 61-80 yrs in which HTN is commonly seen. Dyspnea on exertion (DOE) (39.22%) was the most common presenting complaint encountered followed by palpitation (22.53%) and stroke (17.65%) (Table 4). Similar findings were found in few other studies. (24)

Most common etiology of AF was HTN (55.55%) in patients presented as stroke. Majority of the patients were from east district (70.58%) followed by west district (13.72%) (Table 4). Highest population of east district could have attributed to this. Prevalence of AF was highest in Nepalese community (68.62%) followed by Bhutias (21.56%) (Table 5). This could be because of predominant population of Nepalese in the state. HTN as a risk factor was most prevalent in Nepalese (37.25%) and was a most common etiological factor in all these communities. Various studies that have addressed the risk of AF across different races/ethnicities, focused mainly on Black versus White populations, with much more limited data on other races/ethnicities. (25,14) Further research is necessary to verify and establish reasons for these ethnic differences.

CONCLUSION: This study has provided many insights on epidemiology and various presenting features of patients with AF. We have found few differences in epidemiology of AF in our studies compared to many Indian studies. In our study, majority of the patients (66.66%) were >60 yrs of age and most common etiological factor of AF was HTN followed by RHD and cardiomyopathies in contrast to most other Indian studies where presentation was more common in younger age and RHD was the most common etiology. Stroke as presenting feature was found in 17.65% patients and most common etiology of AF in those patients was found to be HTN. This study has also discussed ethnic aspect of atrial fibrillation in this region. Most of our patients were Nepalese from ethnic point of view. This study would help in early diagnosis and prompt treatment of patients with AF especially in remote areas which remains a challenging problem. More detailed epidemiologic studies are required to improve understanding of the burden of AF and stroke in this region.

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