The Prevalence of Atrial Fibrillation among Acute Medical Admissions in Kuwait

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Key Words

Arrhythmia · Atrial fibrillation · Prevalence · Stroke

Abstract

Objective: To establish the prevalence of atrial fibrillation (AF) among acute medical admissions to the Adan Hospital, Kuwait, and to evaluate the clinical features of the patients. **Subjects and Methods:** Of 2,833 acute medical admissions to the Adan Hospital from January 1 to May 31, 2003, 120 patients with AF were included in the study. The patients were divided into paroxysmal or persistent (PPAF), and chronic atrial fibrillation (CAF). The prevalence of stroke and clinical features of the CAF patients with and without strokes were studied. All the patients with AF underwent echocardiography to evaluate left ventricular ejection fraction (LVEF) and left atrial dimension (LAD). **Results:** The prevalence of AF in the study period was 4.24%, of which 68.3% had CAF and 31.7% had PPAF. The prevalence of heart failure, ischemic heart disease, systemic hypertension, and diabetes mellitus was 27.5, 55.8, 65.8, and 53.3%, respectively. Patients with CAF were older and had a higher prevalence of heart failure compared to PPAF patients. Of the patients with CAF, 26.8% had at least one episode of stroke. The CAF patients had lower LVEF and larger LAD

than PPAF patients. Stroke patients with CAF had lower LVEF and larger LAD as compared to those without stroke. **Conclusion:** Atrial fibrillation is a common admission diagnosis in our hospital. Patients with AF commonly suffer from heart failure, hypertension, diabetes mellitus, and ischemic heart disease. There was a high prevalence of stroke among CAF patients.

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Introduction

Atrial fibrillation (AF) is the most common cardiac arrhythmia affecting over 2 million patients in the United States of America alone [1]. Much of the morbidity associated with AF is attributed to a 5- to 6-fold increase in the risk of stroke [2]. Pooled data from studies of chronic atrial fibrillation (CAF) in North America, the United Kingdom, and Iceland suggest a prevalence of 0.5–1% in the general population [2–6]. The objective of this study was to establish the prevalence of AF among the acute medical admissions in a busy general hospital, the Adan Hospital in Kuwait, and to evaluate the clinical features.

Table 1. Clinical features of the patients with AF on admission

		%
Age, years (mean $\pm$ SD)	63.6 $\pm$ 14.1	
Female gender	76	63
Heart failure	33	27.5
IHD	67	55.8
Hypertension	79	65.8
DM	64	53.3
RHD	9	7.5
Previous stroke	19	15.8
Thyroid disease	1	0.8
COAD	4	3.3

IHD = Ischemic heart disease; DM = diabetes mellitus; COAD = chronic obstructive airway disease; RHD = rheumatic heart disease. Note: Some patients had more than one condition.

Table 2. Comparison of patients with PPAF and CAF

	PPAF (n = 38)	CAF (n = 82)	p value
Age, years (mean $\pm$ SD)	56.8 $\pm$ 14.8	66.8 $\pm$ 14.5	<0.001
Female gender	23 (60.5%)	53 (64.6%)	NS
Heart failure	3 (7.9%)	30 (36.6%)	<0.001
IHD	17 (44.7%)	50 (61%)	0.12
Hypertension	24 (63.2%)	55 (67.1%)	NS
DM	18 (47.4%)	46 (56.1%)	NS
RHD	1 (2.6%)	8 (9.8%)	0.27
Previous stroke	2 (5.3%)	17 (20.1%)	0.03
Thyroid disease	0	1 (1.2%)	NS
COAD	2 (5.3%)	2 (2.4%)	NS
LVEF, %	52 $\pm$ 15.5	41.8 $\pm$ 14.9	0.002
LAD, cm	3.97 $\pm$ 0.7	4.24 $\pm$ 0.83	0.07

IHD = Ischemic heart disease; DM = diabetes mellitus; COAD = chronic obstructive airway disease; RHD = rheumatic heart disease; n = number of patients.

Patients and Methods

The study population consisted of patients in whom AF was detected on the admission electrocardiogram among the patients admitted to the Medical Wards and Coronary Care Unit of the Adan Hospital, Kuwait, from January 1 to May 31, 2003. Using the guidelines for the management of patients with AF of the American College of Cardiology, American Heart Association and European Society of Cardiology [3], the patients were classified into two groups: (a) paroxysmal or persistent atrial fibrillation (PPAF) if the fibrillation spontaneously converted to sinus rhythm within 7 days or if persistent beyond 7 days and required electrical or chemical

conversion, and (b) CAF if the episode was permanent and persisted over 1 year, a determination that was made from patients' history and medical records. The clinical features, hospital course, and echocardiographic findings of both groups were described and compared. M-mode echocardiography was performed by an experienced cardiologist, and left ventricular ejection fraction (LVEF) and left atrial dimension (LAD) were recorded. It was assumed that patients had ischemic heart disease if they met any of the following criteria: (1) a history of acute coronary syndrome, i.e. unstable angina, non-ST-elevation myocardial infarction, or ST-elevation myocardial infarction; (2) established coronary artery disease by coronary angiography, i.e. >50% stenosis in at least one coronary artery; (3) anginal chest pain with stress-inducible ischemic evident through plain exercise stress test, stress echo or stress thallium-201 chloride scintigraphy, and (4) previous coronary artery bypass surgery or percutaneous coronary intervention.

Statistical Analysis

Quantitative data (LVEF and LAD) were recorded as means $\pm$ SD, and were compared using the paired two-tailed Student t test. Qualitative (categorical) data were compared using Fisher's exact test. A probability level of <0.05 was considered statistically significant.

Results

The prevalence rate of patients with AF on admission was 4.24%. Of these, 38 had PPAF (31.7%) and 82 CAF (68.3%). Of the 38 with PPAF, 24 (63.0%) had persistent AF that required either chemical or electrical cardioversion. The baseline features of the AF patients are shown in table 1. The mean age of AF patients was 63.6 $\pm$ 14.1 years, and 76 were female and 44 male. There was a high incidence of heart failure (27.5%); ischemic heart disease (55.8%); systemic hypertension (65.8%), and diabetes mellitus (53.3%) among patients with AF. Moreover, 15.8% of AF patients had a previous history of stroke (not including this admission). Rheumatic heart disease (7.5%) and thyroid disease (0.8%) were not as common as the other comorbid conditions in these patients with AF. The clinical features and conditions of patients with PPAF and CAF are compared in table 2.

Patients with CAF were approximately 10 years older than those with PPAF. There were more patients with heart failure and a history of stroke in the CAF group as compared to the PPAF group ($p < 0.001$ and $p = 0.03$, respectively). Compared to patients with PPAF, there was a trend toward a higher incidence (although statistically not significant) of ischemic heart disease, hypertension, diabetes mellitus, rheumatic heart disease, and thyroid disease in patients with CAF (61, 67.1, 56.1, 9.8, and 1.2%, respectively). Moreover, the overall hospital stay in

Table 3. Causes for admission

	Patients		p value
	PPAF (n = 38)	CAF (n = 82)	
Acute stroke	0	13 (15.9%)	<0.01
Heart failure	6 (15.7%)	36 (43.9%)	<0.01
RVR	38 (100%)	64 (78%)	<0.0007
ACS	3 (7.9%)	9 (11%)	<NS
Sepsis	2 (5.3%)	12 (14.6%)	<0.22
Other	2 (5.3%)	18 (22%)	<0.03

RVR = Rapid ventricular rate; ACS = acute coronary syndrome.

Table 4. Features of CAF patients with/without stroke

	Stroke (n = 22)	No stroke (n = 60)	p value
Age, years (mean $\pm$ SD)	73.6 $\pm$ 10.8	64.8 $\pm$ 15.6	<0.001
Female gender	15 (68.2%)	39 (65%)	NS
LAD, cm	4.76 $\pm$ 0.47	4.07 $\pm$ 0.85	<0.001
LVEF, %	34.55 $\pm$ 13.3	44.0 $\pm$ 14.8	<0.001
Heart failure	13 (59.1%)	17 (28.3%)	0.02
IHD	17 (77.3%)	33 (55%)	0.08
Hypertension	18 (81.1%)	37 (61.7%)	0.14
DM	15 (68.2%)	31 (51.7%)	0.21
RHD	4 (18.2%)	4 (6.7%)	0.2
Hyperlipidemia	6 (27.3%)	5 (8.3%)	0.06

IHD = Ischemic heart disease; DM = diabetes mellitus; RHD = rheumatic heart disease.

patients with CAF was significantly longer than in patients with PPAF (5.6 $\pm$ 3.85 vs. 3.8 $\pm$ 2.94 days, $p < 0.005$). Patients with CAF had significantly lower LVEF than those with PPAF (41.8 vs. 52%, $p = 0.002$). The LAD was higher in the CAF patients (4.24 vs. 3.97 cm) even though the difference was statistically not significant ($p = 0.07$; table 2).

A greater proportion of patients with CAF had acute stroke or decompensated heart failure as a cause of their admission during their hospitalization when compared to those admitted with PPAF (15.9 vs. 0%, $p < 0.01$, and 43.9 vs. 15.7%, $p < 0.01$; table 3). CAF patients had a higher overall prevalence of stroke (old and new). Of the 82 patients with CAF, 22 (26.8%) had a stroke. Table 4 summarizes the features of CAF patients who had a stroke

compared to those who did not have a stroke. Patients with a history of stroke were older (73.6 vs. 64.8 years, $p < 0.001$), and had a higher prevalence of heart failure (59.1 vs. 28.3%, $p = 0.02$). The patients with stroke had a higher prevalence of hypertension, ischemic heart disease, rheumatic disease, and hyperlipidemia compared to those who did not have a stroke, although the differences were not statistically significant. The LVEF was significantly lower, and the LAD was higher in the CAF who had stroke as compared to those who did not have stroke (34.55 vs. 44%, $p < 0.001$, and 4.7 vs. 4.07 cm, $p < 0.001$, respectively).

Discussion

This is the first study in Kuwait to examine the prevalence of AF among acute medical admissions in a busy general hospital, the Adan Hospital. The prevalence of AF (4.24%) was higher than in a previously reported study conducted in Kuala Lumpur, Malaysia, which was 2.8% [7]. A possible explanation could be the fact that our study was over a period of 5 months, while that of Malaysia was only 1 month. Another possible explanation could be the influence of seasonal variation on the admission rate in which AF has been reported to have a peak during the winter period [8], as in our study that covered January to May. Moreover, the medical morbidities noted in this study were higher compared to other studies. The prevalence of comorbidities (table 1) was higher than that obtained from the National Hospital Discharge Survey in the United States from 1985 to 1999 [9]. It was noted in our study that more females had AF (63%) compared to other studies [10]. In the Framingham Heart Study from 1987 to 1989, the prevalence of AF in patients 65–84 years of age was higher in male than female patients [10]. This descriptive study shows that the prevalence of PPAF was significantly lower than that of CAF among the acute medical admissions. This could be due to the fact that most recent onset AF usually terminate spontaneously even prior to seeking medical attention [3]. Moreover, CAF patients had more medical comorbidities like heart failure decompensations and stroke, which almost always needed medical attention. The stroke patients in this study have a risk profile similar to other studies [11–17].

Conclusion

AF is a common diagnosis on admission to the Adan Hospital, Kuwait. More patients had the diagnosis of CAF as compared to PPAF.

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