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Atrial fibrillation risk factors versus advancing age in al Ramadi hospital

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Abstract
Background: AF is common arrhythmia that is associated with increase risk for cardiovascular morbidity and mortality.
Objective: The aim of this study is to assess the prevalance of AF versus advancing age and the presence of risk factors among them in Al-Ramadi teaching hospital.
Materials and Methods: A total of one hundred eleven patients with a diagnosed atrial fibrillation were included in this cross-sectional study conducted in Al- Ramadi Teaching Hospital in the period from 1st of May to 1st of August 2010. Their mean age was 60.3 year with SD (14.1). They are arranged in four age groups. 60 patients (54%) were males & 51 (46%) where females. The presences of known risk factors were recorded. Correlation was examined between the number of patient suffering from AF in each age group in male and female and risk factors. P< 0.05 were considered statistically significant.
Results: The study revealed that the numbers of AF patients were steeply increased in parallel with advancing age, and that the numbers of male patients were more than female. There was a positive correlation between prevalence of AF patients and numbers of AF risk factors. Advancing age and non-valvular heart diseases were the most common risk factors affecting the prevalence of AF patients.
Conclusion: Advancing age and non - valvular heart diseases are the most common risk factors. The prevalence of males suffering AF more than females.

Keywords: atrial fibrillation, heart disease and Arhythmia

Introduction

The earliest historical description of what may have been atrial fibrillation (AF) is found the Yellow Emperors Classic of Internal Medicine, by Huang Ti Nei Ching Su Wen almost 400 year ago [1]. The first electrocardiographic recording of atrial fibrillation was made by Einthoven in 1906. Adams was the first to report the association of mitral stenosis and irregular pulses, utilising Laennec´s recently invented stethoscope [2]. AF is the most common arrhythmia of clinical importance [3]. The prevalence of AF increases markedly with old age [4]. AF incidence and prevalence is known to increase steeply with advancing age [5, 6]. Currently 1.85 million (82%) of US adults with atrial fibrillation are 65 years or older and nearly 830000 (37%) are 80 years or older, by the year 2050, we project that 4.97 million (88%) of US adults with atrial fibrillation will be 65 years or older and 2.95 million (53%) will be 80 years or older [4]. Of note, despite the higher prevalence among men, we estimate that about half of adults with atrial fibrillation will be women, reflecting the greater number of older women in the United States [4]. Furthermore, given the decline in the incidence of rheumatic fever within the United States and the relatively low prevalence of known valvular heart disease observed in our cohort (2.7%), the overwhelming majority of these patients will have nonvalvular atrial fibrillation [4]. In Korea, AF will be serious clinical problem in the future due to substantially increasing of older ages [7]. 'For unknown reasons the prevalence of AF has increased over time, despite adjusting for age and concomitant heart disease [8]. The prevalence of atrial fibrillation (AF) is related to age and is projected to rise exponentially as the population ages and the prevalence of cardiovascular risk factors increases [9]. The incidence of AF is higher at all ages in men than women, but with closing gap with advance age. Nearly 70% of AF between age 65 and 85 years [10]. The risk of developing AF is generally increased in patient with heart failure in both gender [11], however AF is also known to be the precipitating cause of symptoms of heart failure. Congenital heart disease, perimyocarditis and hypertrophic cardiomyopathy are all known to be associated with AF, as well as non-cardiac factors as hyperthyroidism, alcohol abuse, diabetes mellitus, disturbance in electrolyte balance and chronic obstructive pulmonary disease [12]. Atrial fibrillation (AF) is a common arrhythmia that is a potent independent risk factor for stroke and has a significant impact on longevity, approximately doubling all-cause and cardiovascular mortality rates [13]. Chronic AF lead to small increase in the risk of death [14, 15]. Risk factors for stroke in non-valvular AF include advanced age (>65 years) diabetes, hypertension, heart failure, previous stroke or transient ischaemic attack as well as echocardiographic atrial enlargement or ventricular systolic dysfunction [16, 17, 18, 19].

Aim of study

The aim of this study is to assess the prevalance of AF versus advancing age and the presence of risk factors among them in Al-Ramadi teaching hospital.

Materials and methods

In this cross-sectional study, 111 patients admitted with AF diagnosed by clinical and ECG findings in at CCU of Al-Ramadi Teaching Hospital between 1st of May and 1st of August 2010; 60 (54%) are male 51 are female (46%) were studied. All participants answered questionnaires for history of medical illness (hypertension, diabetes mellitus (DM),

cardiovascular disease, chronic chest infection, hyperthyroidism, smoking and alcohol drinking) and full physical examinations that included blood pressure, ECG, and fasting glucose. Blood sampling was done after fasting state at least 12 hr. Plasma glucose were measured using glucometer (Accu Check G No2423178 made in Ireland). The 12-lead resting ECG was done by (bionet cardiocarre 2000 quick guide made in Japan). Blood pressure was measured twice at the right upper arm with a random zero mercury sphygmomanometer in the sitting position using (MDF instrument sphigmomanometry CE 0197). Systolic and diastolic blood pressures were calculated as the average of the two consecutive measurements. Hypertension was defined as a systolic blood pressure 140 mmHg and or a diastolic blood pressure 90 mmHg and above [20] or the use of antihypertensive medication. Diabetes mellitus was diagnosed if the subjects had a fasting glucose level ≥126 mg/dL by [21] or was taking insulin and/or an oral hypoglycemic agent at the current examination. A history of ischemic heart disease and/or myocardial infarction was defined as a self-reported myocardial infarction or ischemic heart disease with hospital admission or the presence of evidence of myocardial infarction or ischemic changes on the ECG. Diagnosis of heart failure was based on a score of heart failure symptoms (NYHA), on medication prescribed with the indication of heart failure, or on hospital discharge diagnoses. Valvular disease and cardiomyopathy was diagnosed by echocardiography. Chronic chest infection was diagnosed by clinical features, and chest x-ray. Thyroid disease was ascertained by abnormal TFT (TSH, T3, and T4).

Alcohol drinking was ascertained by self-report and categorized as the weekly alcohol consumption >90 g ethanol. Smoking was ascertained by self-report. Lone AF was diagnosed by the absence of clinical, echocardiographic findings, other cardiovascular disease or any other AF risk factors. The Patients were divided in four age groups and each group was subdivided into males and females where the range of first group was 20-34, the second one was 35-49, the third group 50-64 and finally the fourth group was more than 64 year as mentioned in table (2). Statistical analysis was done by SPSS 18.0 (Statistical package for the social sciences, SPSS Inc, Chicago, IL, U.S.A.) for Windows. Continuous variables are presented as mean (SD), and categorical variables are reported as proportions. Correlation analysis for categorical variables was done by chi-square test and for continuous variables by Student's T-tests. A p value <0.05 was considered statistically significant.

Results

In this cross-sectional study a total of (111) patients suffering AF, 60 (54%) are male, 51 (46%) are female were studied.As showed her in table (1), we found that the mean age group of males was higher than females

Table 1: Distribution of sample according to age and their SD

Age	Range of age	Mean age	SD
All	22-87	60.3	14.1
Male	22-87	61.8	15
Female	23-80	58.7	13

the percentage of AF patients were increased with the age of patients where the first age group showed the smallest percent, while the highest percent was in forth group (table2).

Table 2: No. of AF patients among 4 age groups

Range (year)	Male	Female	Total	% of total
20-34	5	4	9	8.2
35-49	6	9	15	13.5
50-64	21	21	42	37.8
> 64	28	17	45	40.5
Total	60	51	111	100

Table 3: The number and % of patients in each age groups and their correlation versus advancing age and there statistical significant

Sex	N0.& % of AF Patients Among 4 Age Groups (Year)				Total %	P- Value	Significant
	20-34 Total %	35-49 Total %	50-64 Total %	> 64 Total %			
M	5 (4.5)	6 (5.4)	21 (18.9)	28 (25.2)	60 (54%)	P<0.005	Yes
F	4 (3.7)	9 (8.1)	21 (18.9)	17 (15.3)	51 (46%)	P<0.005	Yes
Total %	9 (8.2)	15 (13.5)	42 (37.8)	45 (40.5)	111 (100%)		

Correlation ($\boldsymbol{X}^2$) of Number of AF Patients versus Advancing Age The chi squere correlation test in table (3) showed statistically significant correlation (p<0.005) between the sex (male or female) and the age, i.e when the age was increased, the number of patients will increased also.

Table 4: Af, risk factors prevalence & % thrughout age groups & gender (f/m) and the correlation (x^2) of af risk factors in male & female v. Advancing age

Risk factors		Age Groups 1 M	1 F	2 M	2 F	3 M	3 F	4 M	4 F	Total M	Total F	prevalence	%	P within age	significant	P within sex M	P within sex F	significant M	significant F
IHD	One Risk Factor	0	0	0	0	1	1	2	0	3	1	4	3.6	0.765	no	0.837	0.692	no	no
HT	One Risk Factor	0	0	0	3	3	0	1	0	4	3	7	6.3	0.083	no	0.365	0.002	no	yes
CMP	One Risk Factor	0	1	1	0	0	0	0	0	1	1	2	1.8	0.046	yes	0.027	0.007	yes	yes
DM	One Risk Factor	0	0	0	1	0	2	0	0	0	3	3	2.7	0.38	no	0	0.52	0	no
Smokers	One Risk Factor	0	0	0	0	1	0	0	0	1	0	1	0.9	0.646	no	0.596	0	no	no
Chest infection	One Risk Factor	0	1	0	0	1	0	0	0	1	1	2	1.8	0.133	no	0.596	0.007	no	yes
Idiopathic	One Risk Factor	3	2	2	2	1	3	3	1	9	8	17	15.3	0.002	yes	0.009	0.163	yes	no
HF	One Risk Factor	0	0	0	0	2	0	3	2	5	2	7	6.3	0.315	no	0.742	0.244	no	no
2 Risk factors		1	0	1	3	8	7	7	2	17	12	29	26.2	0.269	no	0.634	0.247	no	no

3 Risk factors	1	0	2	0	1	6	6	6	10	12	22	19.8	0.49	no	0.279	0.133	no	no
> 3 Risk factors	0	0	0	0	3	2	6	6	9	8	17	15.3	0.027	yes	0.414	0.047	no	yes
Total %	5	4	6	9	21	21	28	17	60	51	111	100						
percentage	4.5	3.7	5.4	8.1	18.9	18.9	25.2	15.3	54	46								

Table (4) showed that CMP, idiopathic AF and more than three risk factor were significant with age group; HT, chest infection and >3Risk factor are significant with female group, while in table (5) showed most common risk factor are hypertention followed by heart failur and ischaemic heart disease.

Table 5: Overall Frequency & percentage of risk factors among 111 AF patients.

Risk Factors	Frequency			Percentage (%)
	Male	female	Total	
IHD	16	16	32	28.8
VHD	2	1	3	2.7
CHD	0	0	0	0
HT	39	27	57	51.4
CMP	1	2	3	2.7
DM	19	10	29	26.1
Pericarditis	1	0	1	0.9
Alcohol	4	0	4	3.6
Smokers	24	7	31	27.9
Chest infection	7	7	14	12.6
Idiopathic	12	9	21	18.9
HF	22	18	40	36.0
Thyroid disease	2	0	2	1.8
> one RF	34	32	66	59.5

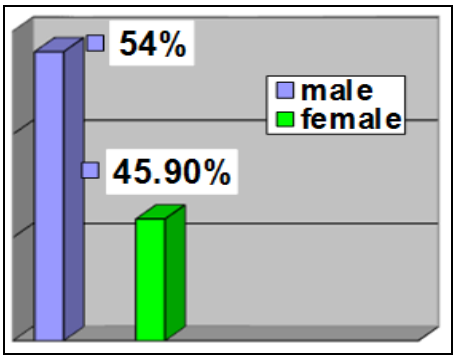

Fig 1: Difference between male and female patient with AF

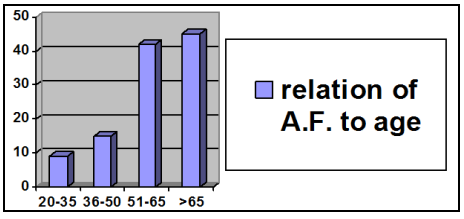

Fig 2: increase prevalence of AF with increasing age

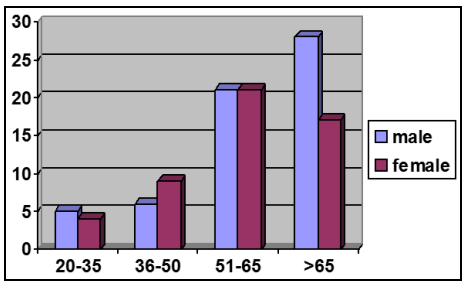

Fig 3: Difference between AF patient between male & female patient of the same age group

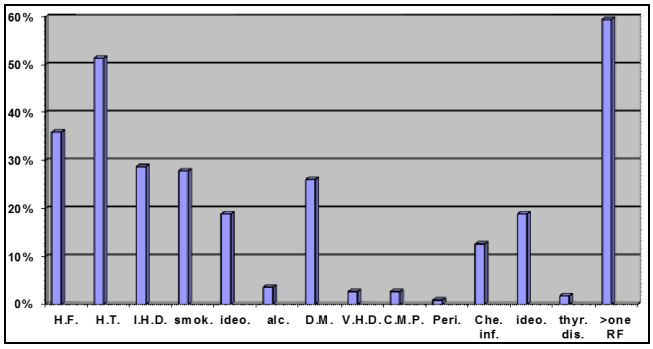

Fig 4: show AF and its prevalence according to risk factors.

Discussion

The mean age of the studied patients was 60.3 years SD (± 14.1), this is less than that reported by (Alan S. Go, *et al*) & (Luis Cea-Calvo *et al.*) [4, 22], which was 71.2 year SD (± 12.2), probably because of presence of risk factors in our patient earlier in life. The study showed that 60 patients (54%) were males and 51 (46%) were females, this defers mildly from that reported by (Alan S. Go, *et al*) [4], which 56.7% male and 43.4% female. Our results is concordance with the data from the Framingham study which revealed that men had 1.5 fold risk of developing AF than women [11] Regarding age groups distribution in our study 21.7% of patients were younger than 50 years while in (Alan S. Go, *et al*) [4] only 10% are younger than 55 years, probably this is related to higher prevalence of myocardial diseases in our society. In concern with the age; the incidence of AF increase with increasing age & highest percent (40.5%) was in those who are older than 64 years, this is in agreement with (Alan S. Go, *et al*) study which reported that 1.85 million (82%) of United States adults with AF are 65 years or older. The study showed that 43 patients (38.7%) were having one risk factor; 4 (3.6%) with IHD, 7 (6.3%) HT, 2 (1.8%) cardiomyopathy, 3 (2.7%) diabetes mellitus, 1 (0.9%) smoking, 2 (1.8%) chest infection, 17 (15.3%) idiopathic (Lone AF), and 7 (6.3%) heart failure.29 patients (26.2%) having two risk factors, while 22 patients (19.8%) having 3 risk factors, 17 patients (15.3%) having more than 3 risk factors. Regarding the difference between male and female within the same age group. There was a significant statistical difference between number of AF patients suffering hypertension, cardiomyopathy, chest infection, patients with >3 risk factors & advancing age, P value < 0.05, table (5).Our study showed that the prevalence of valvular heart disease was low (2.7%) compared to higher percentage of case of ischaemic heart disease (28.8%) and congestive heart failure (36%). This is in contrast with Alan S. Go *et al*. Explanation of ischaemic heart disease: stress of life, late detection of hypertension and valvular heart disease, mood of life in our society. As shown in table (4) which revealed overall frequency and percentage of risk factors among our patients we found that: hypertension 66 (51.4%), heart failure 40 (36%), ischaemic heart disease 32 (28.8%), smoking 31 (27.9%), diabetes mellitus 29 (26.1%), idiopathic 21 (18.9%), chest infection 14 (12.6%), alcohol 4 (3.6%), cardiomyopathy 3 (2.7%), valvular heart disease 3 (2.7%), thyroid disease 2 (1.8%) where appear most

common risk factor are hypertention, heart failur and ischeamic heart disease respectively. Alan S. Go, MD, *et al*, found that adults with diagnosed atrial fibrillation have; known valvular heart disease 4.9%, previous ischemic stroke 8.9%, diagnosed heart failure 29.2%, Hypertension 49.3%, diabetes mellitus 17.1%, previous coronary heart disease 34.6%, angina 21.8%, and myocardial infarction 9.4%. [4]Chinese study showed single cause/factor analysis: advanced age accounted for 58.1%, hypertension 40.1 %, IHD 34.8%, HF 33.1 %, rheumatic valvular disease 23.9 %, idiopathic AF 7.4 %, cardiomyopathy 5.4 %, DM 4.1 %, sick sinus syndrome 3.2 %, hyperthyroidism 2.5 %, and others 3.1%. Combined analysis showed that advanced age and hypertension are the most common, followed by advanced age and IHD [23]. Joon Hoon Jeong recorded that the most common risk factor of AF was cardiac disease & after adjusting for other associated factors, as well as age and sex, diabetes and hypertension remained significant predictors of AF [7]. Framingham Heart Study suggested that (14%) of the AF risk in both men and women was attributable to hypertension [8]. As reported in most of studies, neither obesity nor alcohol intake was associated with AF incidence in either sex [11]. This study found that the prevalence of AF patients suffering more than one risk factor were 66 (59.5%) patients, among them 29 (26.2%), 22 (19.8%), and 17 (15.3%) had, 2 risk factor, 3 risk factor, and > than 3 risk factor respectively. This discrepancy between this study and that reported numbers mentioned above, is most likely due to the presence of more than one risk factors, and/or to the severity of diseases in these patients, to the small number of my study or to the difference in the nature of study design. Combined analysis showed that advanced age and hypertension are the most common, followed by advanced age and CHD [23]. This is partially in agreement with that reported by this study.

Conclusion

1. Advancing age and non-valvular heart diseases are the most potent A.F. risk factors.
2. The number and percentage of patient suffering > one risk factor are higher than those suffering one risk factor.
3. The prevalence of male suffering AF is more than female.

Recommendation

Coordinated efforts by cardiologists, primary care providers, and neurologists will be needed to meet the increasing challenge of major complication prevention and rhythm management in the growing elderly population with atrial fibrillation.

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