The Effect of Age on Clinical Presentations of Patients with Atrial Fibrillation

Ali Jabbar Al-Ibrahemi[*] , Taghreed Khazal Mohammed[**] , Mahmood Riyadh Al-Haleem[*]

ABSTRACT:

BACKGROUND:

Atrial fibrillation(AF) is a supraventricular tachyarrhythmia characterized by uncoordinated atrial activation with consequent deterioration of atrial mechanical function.

OBJECTIVE:

To demonstrate the effect of the age on clinical presentations of patients with atrial fibrillation.

METHODS:

This is a descriptive cross sectional study carried out in a tertiary cardiac center for 191 patients with atrial fibrillation who attended the selected hospital for any complaint.Their age was ranging from 18 years and above of both sexes.

RESULTS:

The more frequent age group for both sexes was between (40-65years). Palpitation was significant presentation in patient above 65 years and dyspnea and hypotention were more in patients below 40 years.The age is also had a significant effect on cardiomegaly on CXR, and on the echocardiographic findings of dilated LA, dilated LV, diastolic dysfunction and segmental wall abnormalities.

CONCLUSION:

The incidence of atrial fibrillation is age and gender related and age has an important effect on certain clinical presentations.

KEY WORD: Atrial fibrillation, Effect of age , cinical presentations.

INTRODUCTION:

Atrial fibrillation (AF) is a supraventricular tachyarrhythmia characterized by uncoordinated atrial activation with consequent deterioration of atrial mechanical function [(1)]. AF is the most common arrhythmia in clinical practice, accounting for approximately one third of admissions resulting from cardiac rhythm disturbances [(2)]. During the last 20 years, hospital admissions for AF have increased by 66% for a number of reasons, including the aging of the population, the rising prevalence of chronic heart disease, and more frequent diagnosis as a result of increased monitoring [(3)].The estimated prevalence of AF in the general population is 0.4% to 1%, increasing with advancing age [(4)]. The median age of AF patients is about 75 years with approximately 70% between 65 and 85 years of age. About one-third of all patients with AF are aged 80 years or older and it is estimated that by 2050 half of patients will be in this age group[(4)].

*Department of cardiology, Ibn Albitar Cardiac Center.

**Al-Adhamiya Primary Health Care Sector,Baghdad Al-Russafa Health Directoriate.

METHODS:

This study was conducted in Ibn Albitar Cardiac Center in Baghdad city. The study population included 191 patients. The subjects included in the study were interviewed according to a questionnaire. The questionnaires were filled by the researcher through direct interview with the study population. All the patients were subjected to the following investigations : electrocardiography (ECG) , echocardiography,chest X-ray and thyroid hormones estimation. Some of the patients were subjected to cardiac catheterization.

Statistical analysis

Statistical package for social sciences version 18(SPSSv.18) and Chi-square test were used to analyze the results.The statistical analysis applied at level of significance $\alpha = 0.05$ ($P \leq 0.05$)

RESULTS:

A total of 191 patients were approached to be enrolled in the study. Ninety eight patients (51.3%) were male and ninety three patients (48.7%) were female. The more frequent age group for both sexes was between(40-65 years). The least age group was <40 years (21 patients).(Table 1) .

Table 1: Distribution of study sample according to the age and gender.

Variables		Age Group (year)			Total	
		< 40	40 - 65	> 65		
		N= 21	N= 104	N= 66	N= 191	P
		100.0%	100.0%	100.0%	100.0%	Value
Sex						
• Male	N	14	57	27	98	
	%	66.7%	54.8%	40.9%	51.3%	0.069
• Female	N	7	47	39	93	
	%	33.3%	45.2%	59.1%	48.7%	

One hundred fifty patients (78.5%) were complaining from palpitation which was significantly more common in patients below 65years; 16 patients (8.4%) had dizziness which was more in patients below 40 years with a significant P value. (Table 2).

Table 2: distribution of cases according to the clinical presentation.

Clinical Presentation		Age Group (year)			Total	
		< 40	40 - 65	> 65		
		N= 21	N= 104	N= 66	N= 191	P
		100.0%	100.0%	100.0%	100.0%	Value
Palpitation	N	20	86	44	150	0.007
	%	95.2%	82.7%	66.7%	78.5%	
Dyspnea	N	9	66	41	116	0.203
	%	42.9%	63.5%	62.1%	60.7%	
Dizziness	N	5	7	4	16	0.025
	%	23.8%	6.7%	6.1%	8.4%	
Fatigue	N	3	9	11	23	0.278
	%	14.3%	8.7%	16.7%	12.0%	
Syncope	N	0	2	3	5	0.225
	%	0.0%	1.9%	4.5%	2.6%	
Thromboembolic Event	N	2	10	10	22	0.520
	%	9.5%	9.6%	15.2%	11.5%	

Ninety nine patients (51.8%) of the study population were hemodynamically unstable.Sixteen patients (16.2%) presented with angina, 10 patients (10.1%) had got hypotension with a significant p value in patients below 40 years and 63 patients(63.6%) presented with pulmonary edema. (Table 3).

Table 3 : Distribution of Hemodynamically unstable patients with AF according to the underlying cause of hemodynamic instability.

		Age Group (year)			Total	
		< 40	40 - 65	> 65		
		N= 7	N= 58	N= 34	N= 99	P
		100.0%	100.0%	100.0%	100.0%	Value
Angina	N	0	12	4	16	0.258
	%	0.0%	20.7%	11.8%	16.2%	
Hypotension	N	4	5	1	10	0.000
	%	57.1%	8.6%	2.9%	10.1%	
Pulmonary Edema	N	3	36	24	63	0.354
	%	42.9%	62.1%	70.6%	63.6%	

ECG was done for all patients to confirm AF. One hundred fifty five patients (81.2%) had no ischemic changes, and 18.8% had ischemic changes. One hundred seventy seven patients(92.7%) had no left ventricular or right ventricular enlargement, and only 11 patients(5.8%) had left ventricular hypertrophy (LVH) , and 3 patients (1.6%) had right ventricular hypertrophy (RVH). One hundred seventy five patients (91.6%) had no conduction defect while 9 patients (4.7%) had left budle branch block (LBBB) and 6 patients (3.1%) had right bandle branch block (RBBB). (Table 4).

Table 4 : ECG findings in patients with AF.

ECG Changes		Age Group (year)		Total N= 191 100.0%		PValue
		< 40 N= 21 100.0%	40 - 65 N= 104 100.0%	> 65 N= 66 100.0%		
Ischemic Changes						0.282
• None	N %	21 100.0%	84 80.8%	50 75.8%	155 81.2%	
• ST Depression	N %	0 0.0%	9 8.7%	5 7.6%	14 7.3%	
• T Inversion	N %	0 0.0%	1 1.0%	1 1.5%	2 1.0%	
• Q Wave	N %	0 0.0%	10 9.6%	9 13.6%	19 10%	
• ST Elevation	N %	0 0.0%	0 0.0%	1 1.5%	1 0.5%	
Chamber Enlargement						
None	N %	19 90.5%	99 95.2%	59 89.4%	177 92.7%	0.339
Left Ventricle	N %	1 4.8%	3 2.9%	7 10.6%	11 5.8%	

Right Ventricle	N %	1 4.8%	2 1.9%	0 0.0%	3 1.6%	
Conduction Defects						
None	N %	19 90.5%	92 88.5%	64 97.0%	175 91.6%	0.337
LBBB	N %	1 4.8%	7 6.7%	1 1.5%	9 4.7%	
RBBB	N %	1 4.8%	4 3.8%	1 1.5%	6 3.1%	

Chest X-ray was done for all patients of the study ; 87 patients (45.5%) had cardiomegaly which was more in patients above 40 years, with a significant P value, and 72 patients (37.7%) had pulmonary edema.(Table 5).

Table 5: CXR findings in patients with AF.

CXR		Age Group (year)				
Findings		< 40	40 - 65	> 65	Total	
		N= 21	N= 104	N= 66	N= 191	P
		100.0%	100.0%	100.0%	100.0%	Value
Cardiomegaly	N	4	51	32	87	0.035
	%	19.0%	49.0%	48.5%	45.5%	
Pulmonary Edema	N	5	43	24	72	0.307
	%	23.8%	41.3%	36.4%	37.7%	

All of the patients in the study were subjected to echocardiogrphic examination. Sixty patients (31.4%) had reduced left ventricular ejection fraction (LVEF); (<50%), 39 patients (20.4%) had dilated right atrium and 139 patients (72.8%) had dilated left atrium with a significant P value for all age groups .Seventy patients (36.6%) had dilated left ventricle which was more frequent in patients above 40 years with a significant P value, and 51 patients (26.7%) had dilated right ventricle which was significantly more frequent in patients above 40 years old. Eighty six patients (45%) had diastolic dysfunction which was more frequent in patients above 40 years with a significant P value. Forty four patients (23%) had segmental wall motion abnormality which was more frequent in patients above 40 years with a significant P value. Eleven patients(5.8%) had concentric LVH.(Table 6).

Table 6 : Echocardiographic findings in patients with AF.

		Age Group (year)				
		< 40	40 - 65	> 65	Total	
Echo Findings		N= 21	N= 104	N= 66	N= 191	P
		100.0%	100.0%	100.0%	100.0%	Value
Ejection Fraction %						
• Normal EF	N	19	71	41	131	
	%	90.5%	68.3%	62.1%	68.6%	0.051
• Reduced EF	N	2	33	25	60	
	%	9.5%	31.7%	37.9%	31.4%	
Right Atrium						
• Normal RA	N	15	82	55	152	
	%	71.4%	78.8%	83.3%	79.6%	0.481
• Dilated RA	N	6	22	11	39	
	%	28.6%	21.2%	16.7%	20.4%	
Left Atrium						
• Normal LA	N	13	31	8	52	
	%	61.9%	29.8%	12.1%	27.2%	0.000
• Dilated LA	N	8	73	58	139	
	%	38.1%	70.2%	87.9%	72.8%	
Left Ventricle						
• Normal LV	N	20	63	38	121	
	%	95.2%	60.6%	57.6%	63.4%	0.005*
• Dilated LV	N	1	41	28	70	
	%	4.8%	39.4%	42.4%	36.6%	
Right Ventricle						
• Normal RV	N	13	68	58	139	
	%	61.9%	65.4%	87.9%	72.8%	
• Dilated RV	N	7	36	8	51	0.003*
	%	33.3%	34.6%	12.1%	26.7%	

*after condensing echo finding into normal and not normal

DISCUSSION:

There are major gaps in our knowledge regarding the relations of race and ethnicity, advancing age, sex, and socioeconomic status, with AF-related symptoms and functional status [5].

In this study there was significant age related differences in presentation regarding palpitation,which is more in the age group below 65 years. Dizziness and hypotension were more in the age group below 40 years. Syncope was present in only 2.6% with no difference in all age groups; collectively dizziness and syncope constitute 11% as a presenting feature. Sympathovagal imbalance may play a role in patients with AF and dizziness [6]. Increased sympathetic and parasympathetic impulses can both result in adverse hemodynamic effects, thus predicting the specific effects of these impulses during AF is challenging [7].

Elderly patients were more frequently in European Heart Rhythm Association class I ($p < 0.001$) and were less often symptomatic (52.4% vs. 64.4%; $p < 0.0001$), with lower prevalence of palpitations and feelings of fear/anxiety partially counterbalanced by more frequent dyspnea [8].

Thromboembolic events occurred in 11.5% of patients in this study . In Novo G et al study, thromboembolism was observed in 26.6% of the patients and older age is strongly associated with thromboembolic events, the difference may be related to small sample size in our study (191 patients vs 480 patient) [9].

In this study the occurrence of angina was 16.2% which was comparable to Salih SA et al study (13.4%), while pulmonary edema in 63.6% of patients in the current study unlike what was

registered in the same study (26.25%); the explanations for this difference was; in this study more cases with cardiomegaly on chest radiograph and reduced left ventricular ejection fraction on Echocardiography in comparison with Salih SA et al study [10].

In this study the patients who where less than forty years old were poorly tolerating AF because the majority had an underlying cardiac disease therefore hypotension was more evident in patients below 40 years with significant P value.

The ECG findings in patients with AF in this study were not affected by the age, however their incidence were comparable to salih SA et al study in wich he found that the ECG findings of left ventricular hypertrophy (LVH) were found in 81 (11.25%) patients; P<0.0001 and were significantly more common in acute AF than in chronic AF [10]. Ischemia, including changes of acute myocardial infarction, old myocardial infarction, or ischemic ST-segment and T-wave changes, was seen in 143 (19.8%) patients and was more common in acute AF than in chronic AF [10].

Cardiomegally on chest X-Ray was found in 45.5% of patients included in this study, it was significantly more frequent in patients above 40 years old. This result was comparable to Renfrew/Paisley study in which it was found that radiological cardiomegaly led to a 14-fold increase in the likelihood of new AF. These findings support the view that cardiothoracic ratio is a simple and powerful predictor of adverse cardiovascular outcomes [11].

In this study; we found that there was a significant effect of the age on the following echocardiographic findings : (reduced ejection fraction, dilated left atrium, dilated left ventricle, dilated right ventricle, segmental wall motion abnormality and diastolic dysfunction).All these findings are more commonly found in patients more than 40 years old. Echocardiography has a unique and important role in the assessment of cardiac structure and function, risk stratification and increasing in guiding the management of AF [12,14].

CONCLUSION:

The incidence of AF is age and gender related. Age has an important effect on certain clinical parameters.

Recommendation

Projections of the increasing burden of AF clearly highlight the need for new approaches and the need for primary prevention and management strategies for reducing cardiovascular morbidity and mortality.

REFERENCES:

1. January CT, Wann LS, Alpert JS, et al. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines and the Heart Rhythm Society. Circulation. Circulation. 2014;130:2071-2104.
2. Anter E, Jessup M, Callans DJ. Atrial fibrillation and heart failure: treatment considerations for a dual epidemic.Circulation. 2009; 119: 2516-25.
3. Friberg J, Buch P, Scharling H, Gadsbphioll N, Jensen GB. Rising rates of hospital admissions for atrial fibrillation. Epidemiology. 2003;14:666-72.
4. Go AS, Hylek EM, Phillips KA, et al. Prevalence of diagnosed atrial fibrillation in adults: national implications for rhythm management and stroke prevention: the AnTicoagulation and Risk Factors in Atrial Fibrillation (ATRIA) Study. JAMA. 2001;285:2370–5.
5. Rienstra M, Lubitz SA, Mahida S, Magnani JW, Fontes JD, Sinner MF, Van Gelder IC, Ellinor PT, Benjamin EJ. Symptoms and functional status of patients with atrial fibrillation: state of the art and future research opportunities. Circulation. 2012;125:2933-43.
6. van den Berg MP, Hassink RJ, Tuinenburg AE, Lefrandt JD, de Kam PJ, Crijns HJ. Impaired autonomic function predicts dizziness at onset of paroxysmal atrial fibrillation. Int J Cardiol. 2001;81:175–80.
7. MacRae CA. Symptoms in atrial fibrillation: Why keep score? Circ Arrhythm Electrophysiol. 2009;2:215–17.
8. Fumagalli S, Said SAM, Laroche C,et al. Age-Related Differences in Presentation, Treatment, and Outcome of Patients With Atrial Fibrillation in EuropeThe EORP-AF General Pilot Registry (EURObservational Research Programme-Atrial Fibrillation). JACC: Clinical Electrophysiology. 2015;1:326-34.
9. Novo G, Mansueto P, La Franca ML, Di Leo R, Di Rosa S, Fazio G, Mansueto S, Ferrara F, Novo S. Risk factors, atrial fibrillation and thromboembolic events. Int Angiol.2008;27:433-8.

10. Salih SA, Showlag MS, Al-Qahtani MA, Taha A, Yousif M. Clinical characteristics of patients with atrial fibrillation at a tertiary care hospital in the central region of Saudi Arabia. J Family Community Med. 2011;18:80–84.

11. Stewart S, Hart CL, Hole DJ, McMurray JJ. Population prevalence, incidence, and predictors of atrial fibrillation in the Renfrew/Paisley study. Heart. 2001; 86: 516–21.

12. Troughton RW, Asher CR, Klein AL. The role of echocardiography in atrial fibrillation and cardioversion. Heart. 2003;89:1447-54.

13. Donal E, Lip GY, Galderisi M, Goette A, et al. EACVI/EHRA Expert Consensus Document on the role of multi-modality imaging for the evaluation of patients with atrial fibrillation. Eur Heart J Cardiovasc Imaging. 2016 ;17:355-83.