

International Journal of Cardiology Research



ISSN Print: 2663-4104
ISSN Online: 2663-4112
Impact Factor: RJIF 5.2
IJCR 2024; 6(2): 07-11
www.cardiologyjournal.in
Received: 05-05-2024
Accepted: 09-06-2024

Dr. Murtadha Kudhur Hammod
Department of Medicine, Tikrit
teaching hospital, Salahudin,
Iraq

Epidemiology, causes and risk factors in atrial fibrillation

Dr. Murtadha Kudhur Hammod

DOI: <https://doi.org/10.33545/26634104.2024.v6.i2a.48>

Abstract

Context: Atrial fibrillation is the most common sustained arrhythmia, increases with age, and presents with highly variable symptoms and severity. Paroxysmal, persistent, and permanent form require very individualized approaches to management. The most important aspect of diagnosis is the causes, the risk groups and risk stratification with respect to risk of thromboembolism. The general goals in treatment are in order of importance: Prevention of thromboembolism, control of ventricular response, restoration of sinus rhythm, and maintenance of sinus rhythm by preventing recurrence.

Objective: To assess the prevalence of AF with age and sex, causes of AF and risk factors for thromboembolism in AF patients.

Design: prospective study of 150 patients with sustained AF

Setting: Medical ward of Tikrit hospital from

Patient and method: 150 patients were included in this study all have permanent AF. The final diagnosis was based on careful evaluation of clinical data and the results of various investigations, all were studied by history, examination, ECG, radiology, echocardiography and biochemical tests when indicated, ischemic heart disease was diagnosed by the history of chest pain typical of chest pain of myocardial ischemia and electrocardiographic criteria of myocardial ischemia. Prevalence of age and sex with AF, causes of AF, risk factors for thromboembolism were assessed.

Results: AF prevalence increase with age, with peak age between 61-70 year, it was higher in men than women, with men: women ratio 1.3: 1.

IHD is the main cause of AF 74 cases (49.3%), followed by mitral valve disease 37 cases (24.7%), while HPT is the third main cause 15 cases (10%), followed by lone AF 11 cases (7.3%) then the other causes, aortic valve disease 3 cases (2%), thyrotoxicosis 3 cases (2%), cardiomyopathy 3 cases (2%), COPD 2 cases (1.3%), sick sinus syndrome 1 case (0.7%), ASD 1 case (0.7%). Risk factors for thromboembolism in 150 patients with AF were: Age over 65 years 88 case 58.65%. Echocardiography (feature of left atrial enlargement) 83 case. IHD 74 case 49.3%. Heart failure 61 case 40.6%. Mitral valve disease 37 case 24.7%. Previous stroke 33 case 22%. Diabetes mellitus 31 case 20.6%.

Conclusion

1. AF prevalence increase with age, with peak age between 61-70 year.
2. AF was higher in men than women, with men: women ratio 1.3: 1.
3. IHD is the main cause of AF 74 cases (49.3%), followed by mitral valve disease 37 cases (24.7%), while HPT is the third main cause 15 cases (10%), followed by lone AF 11 cases (7.3%) then the other causes, aortic valve disease 3 cases (2%), thyrotoxicosis 3 cases (2%), cardiomyopathy 3 cases (2%), COPD 2 cases (1.3%), sick sinus syndrome 1 case (0.7%), ASD 1 case (0.7%).
4. Risk factors for TE were: Age over 65 years 88 case 58.65%. Echocardiography (feature of left atrial enlargement) 83 case. IHD 74 case 49.3%. Heart failure 61 case 40.6%. Mitral valve disease 37 case 24.7%. Previous stroke 33 case 22%. Diabetes mellitus 31 case 20.6%.

Keywords: Atrial fibrillation prevalence, Thromboembolism risk factors, Ischemic heart disease, Age-related AF, Sex differences in AF

Introduction

Atrial Fibrillation (AF) is the most common supraventricular arrhythmia. It is the result of multiple reentrant loops continuously circulating in both atria, generating chaotic atrial depolarization with resultant ineffective atrial contraction.⁽¹⁾ On surface ECG AF is characterized by irregular ventricular pattern and absence of organized atrial activity (i.e., no p wave presents) ^[1, 2].

Corresponding Author:
Dr. Murtadha Kudhur Hammod
Department of Medicine, Tikrit
teaching hospital, Salahudin,
Iraq

Atrial fibrillation has been judged to promote stroke by favoring thrombus formation in local zones of static blood, especially in left atrial appendages [3]. The morbidity associated with AF is related to (1) Excessive ventricular rate, which in turn may lead to hypotension, pulmonary edema or angina pectoris in susceptible individual (2) The pause following cessation of AF can cause syncope (3) Systemic embolization (4) Hemodynamic changes causing heart failure (6) Anxiety secondary to palpitation (7) AF may cause cardiomyopathy related to persistent rapid rates (so called tachycardia induced cardiomyopathy) [4,5].

The causes of AF are most common in patient with cardiovascular diseases such as coronary artery diseases, hypertension, valvular heart diseases especially mitral stenosis and regurgitation, cardiomyopathy, atrial septal defect, thyrotoxicosis in elderly patients [6-8].

AF is classified into paroxysmal short self-limiting-terminating episodes, persistent recurrent episodes requiring intervention for restoration to sinus rhythm, and permanent with no intervention restore sinus rhythm [9-11].

The main risk factors for systemic thromboembolism in AF [12-14]

- Advanced age > 65year
- Female sex
- Hypertension
- Previous emboli
- Diabetes mellitus
- Heart failure
- Thyrotoxicosis
- Hypercoagulability
- Previous TIA or CVA
- Ischemic heart disease
- Valvular diseases

By echocardiographic the risk for thromboembolism are

- Increased left atrial size > 4 cm⁽¹⁴⁾
- Left ventricular dysfunction
- Mitral annular calcification
- Left atrial thrombus
- Left atrial "smoke"

Aim of the study

- To determine prevalence of AF according to the age and sex.
- To determine the main causes of AF and their frequencies.
- To determine main risk factors of thromboembolism in AF and their frequencies.

Patients and methods

One hundred fifty patients were admitted to Tikrit teaching hospital from April 2019 to June 2020 all were studied. Their ages were 20 to 90 years, with a mean age of (62.15±13.7).

All were studied by history, examination, ECG, radiology, echocardiography and biochemical tests when indicated, they all have the diagnosis of AF on the basis of 12 leads ECG, by the absence of P wave and variable degree of fibrillary activity with R-R intervals showing no ordered pattern. The causes of AF were determined; the blood pressure of each patient was measured according to WHO criteria and phase 5 was recorded as the diastolic blood pressure and known cases of hypertension or reading above 140/90 was regarded as hypertension [15].

Ischemic heart disease was diagnosed by the history of chest pain typical of myocardial ischemia and electrocardiographic criteria of myocardial ischemia i.e. old myocardial infarction and or ischemic S-T segment, T wave changes [13].

Valvular heart diseases, congenital heart diseases and cardiomyopathy were diagnosed clinically and by electrocardiography, echocardiography and radiology. T₃, T₄, TSH were measured for thyrotoxic patients, pulmonary function test was made for patients with COPD, while lone AF was diagnosed by exclusion.

The prevalence of AF according to the age and sex was determined. The causes of AF and the risk factors of thromboembolism among AF patients were determined.

Statistics

The age of the patients as mean age ± SD. The P value and percentage of the parameters were calculated chi square test.

Results

Table 1: Distribution of AF patients according to the age &sex

Age	Male	%	Female	%
21-30	3	2%	2	1.3%
31-40	7	4.7%	5	3.3%
41-50	8	5.3%	6	4%
51-60	16	10.7%	12	8%
61-70	32	21.3%	21	14%
71-80	19	12.7%	16	10.7%
81-90	2	1.3%	1	0.7%
Total	87	58%	63	42%

P value = 0.05 & male to female ratio 1.3:1

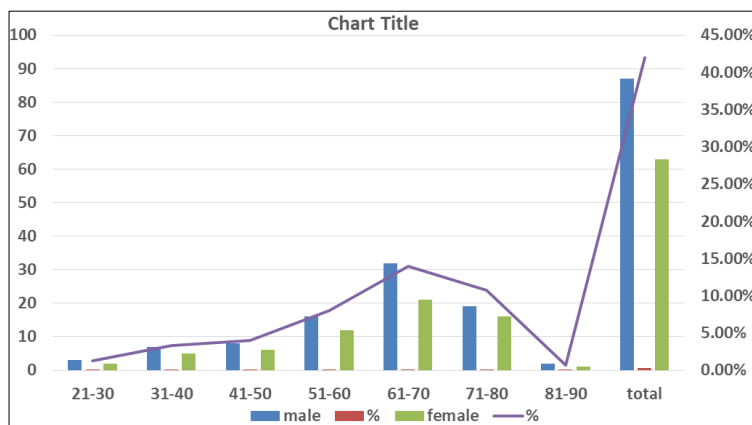


Fig 1: AF prevalence by age and sex

Table 2: Causes of AF and prevalence in 150 patients

Causes	No	%
IHD	74	49.3%
Mitral Valve Disease	37	24.7%
HPT	15	10%
Lone AF	11	7.3%
Aortic Valve Disease	3	2%
Thyrototoxicosis	3	2%
Cardiomyopathy	3	2%
COPD	2	1.3%
Sick Sinus Syndrome	1	0.7%
ASD	1	0.7%
Total	150	100%

Table 3: Risk factors for thromboembolism in 150 AF patients

Risk factors	No	%
Age over 65	88	58.6%
Left atrial dilatation	83	55.3%
Ischemic heart disease	74	49.3%
Heart failure	61	40.6%
Mitral valve disease	37	24.7%
Previous stroke	33	22%
Diabetes mellitus	31	20.6%

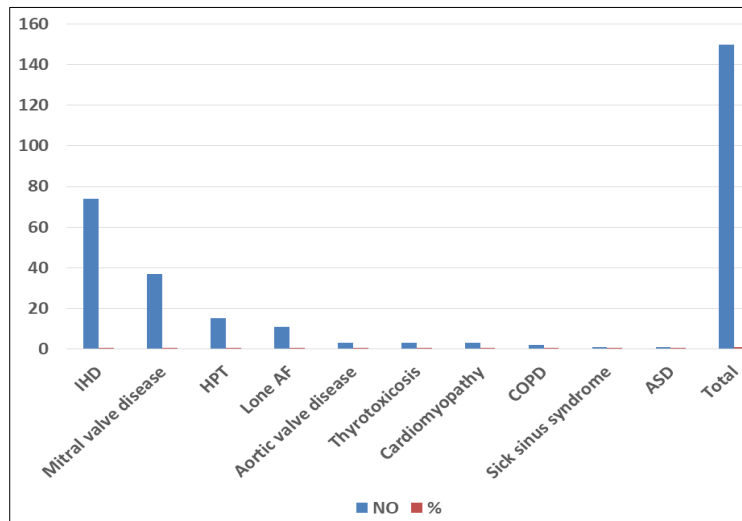


Fig 2: Causes of AF and their prevalence

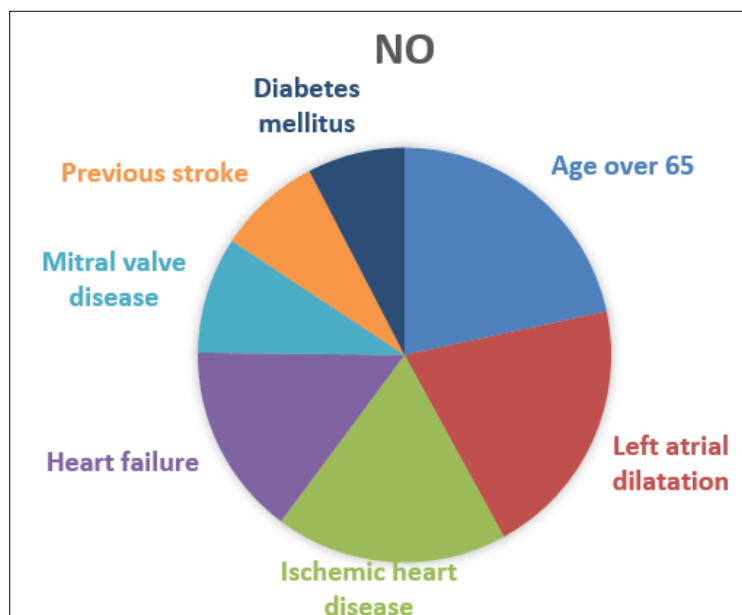


Fig 3: Risk factors for thromboembolism in AF patients

Results

One hundred and fifty patients were included, their ages ranged between 20-90 years with a mean age of (62.15±13.7).

Prevalence of AF increase with age with peak age group between (61-70 year) (35.3%) and male (87 patients, 58%) more than female (63 patients, 42%) in all age groups with men: women 1.3:1 as in table (1) n & Figure (1).

The causes and prevalence of AF patients in this study were

- IHD 74 case 49.3%
- Mitral valve disease 37 case 24.7%
- HPT 15 case 10%
- Lone AF 11 case 7.3%
- Aortic valve disease 3 cases 2%
- Thyrotoxicosis 3 cases 2%
- Cardiomyopathy 3 cases 2%
- COPD 2 cases 1.3%
- Sick sinus syndrome 1 case 0.7%
- ASD 1 case 0.7%

As in table (2) & Figure (2).

Risk factors for thromboembolism in 150 patients with AF were:

- Age over 65 years 88 case 58.65%.
- Echocardiography (feature of left atrial enlargement) 83 case.
- IHD 74 case 49.3%.
- Heart failure 61 case 40.6%.
- Mitral valve disease 37 case 24.7%.
- Previous stroke 33 case 22%.
- Diabetes mellitus 31 case 20.6%.

As in table (3) & Figure (3).

Discussion

AF has been judged to promote stroke by favoring thrombus formation in the left atrial appendages. Oral anticoagulation with warfarin reduce the risk of strokes related by 60% [9].

Our study shows that AF prevalence increase with age, with peak age between 61-70 year which is agreement with other study [6] and the prevalence of AF higher in men than in women in all age groups with men: women 1.3:1 which is in agreement with other studies [16, 17].

The main causes of AF in present study were IHD, mitral valve diseases, HPT, lone AF, aortic valve diseases, thyrotoxicosis, cardiomyopathy, COPD, sick sinus syndrome, ASD in order of frequency. The main risk factors for thromboembolism were identified as advancing age, left atrial dilatation, IHD, heart failure, mitral valve diseases, previous stroke and diabetes mellitus in order of frequency.

Conclusions

1. AF prevalence increases with age, with peak age group between 61-70 years old.
2. IHD was the main cause of AF 49.3%, followed by mitral valve disease 24.7%, while HPT was the third main cause 10% followed by lone AF 7.3% then the other causes.
3. Risk factors for thromboembolism in AF were:

Age over 65 years 88 case 58.65%. Then Echocardiography (Feature of left atrial enlargement) 83 case. Then IHD 74 case 49.3%. Then other risk factors.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Richard AL, David Hills L. Tachyarrhythmia. In Anderioli and Carpenter. Cecil essentials of medicine. 7th edition in Canada.2007 by Saunders Elsevier: 126.
2. Michael E. Cain. Atrial fibrillation Rhythm or rate control. N Engl J Med. 2002;347:23.
3. Heppell RM Berkin KE, Mclenachan JM, *et al.* Haemostatic and Haemodynamic abnormalities associated with left atrial thrombosis in non-rheumatic atrial fibrillation. Heart. 1997;77:11.
4. Eugene B. Cardiac arrhythmia. In: Dennes LK, Anthony S. *et al.* Harrison's principles of internal medicine. 16 edition, McGraw-Hill. 2005:1345-1346.
5. Richard L. Page. Newly Diagnosed Atrial Fibrillation. N Engl J Med. 2004;351:2409.
6. Waheed A, William C, Assad M. Indication for Anticoagulation in Atrial Fibrillation. American Family Physician 1998;58:1-2.
7. John CA, cardiovascular disease. In: Parveen K, Michael. Clinical Medicine Kumar and Clark. Fifth edition. W.B. Saunders, 2002, 743.
8. Paul AF. Specific arrhythmia problem. In Uday, Prakash. Mayo internal medicine. In USA, 2001, 77.
9. Bloomfield p, Bradbury A, Grubb N.R. Disorder of Heart rate, Rhythm and conduction, In Nicholas A, Boon, Nichi R. Davidson's Principles and practice of medicine. 20th edition. Churchill Livingstone Elsever, 2006, 564.
10. Christopher RC. Atrial fibrillation the most common arrhythmia. Tex Heart Inst. 2000;27:260.
11. Valentine F, Lars E, Ritchard W. Management patient with atrial fibrillation. American heart association March. 2002, 7.
12. LIP, Gregory YH, *et al.* Refining clinical risk stratification for predicting stroke and thromboembolism in atrial fibrillation using a novel risk factor-based approach: The euro heart survey on atrial fibrillation. Chest. 2010;137(2):263-272.
13. LAU, Dennis H, *et al.* Modifiable risk factors and atrial fibrillation. Circulation. 2017;136(6):583-596.
14. Sam kaddoura. Echo made easy. Churchill Livingstone Edinburgh, 2002, 16.
15. Erica J, Lawrance E, Petter R. Cardiovascular and coronary risk estimation in hypertension management. In: Petter M. Education in heart volume 3. First published in, 2003, 182.
16. Furberg CD, Psaty BM, Manolio TA, *et al.* Prevalence of atrial fibrillation in elderly subjects (The Cardiovascular Health study). Am J Cardiol. 1994;74:236-241.

17. Wolf PA, Benjamin EJ, Belanger AJ *et al.* Secular trends in the prevalence of atrial fibrillation: The Framingham study. *Am heart J.* 1996;131:790-795

How to Cite This Article

Hmoud MK. Epidemiology, causes and risk factors in atrial fibrillation. *International Journal of Cardiology Research* 2024; 6(2): 07-11.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.