



CLINICAL AND EPIDEMIOLOGICAL PROFILE OF ATRIAL FIBRILLATION PATIENTS PRESENTING TO THE EMERGENCY ROOM OF TERTIARY CARE GOVERNMENT TEACHING HOSPITAL.

Emergency Medicine

Dr. Madhuri Ramesh Dhaware

Senior Resident, Department of Emergency Medicine, BJGMC & SGH, Pune

Dr. Rajeshwari Vhora

Head of the Department, Department of Emergency Medicine, BJGMC & SGH, Pune

Dr. Harshad Dongre

Associate Professor, Department of Emergency Medicine, BJGMC & SGH, Pune

Dr. Dona Nimmy Jais

Senior Resident, Department of Emergency Medicine, BJGMC & SGH, Pune

Dr. Rakesh K Kumar

Senior Resident, Department of Emergency Medicine, BJGMC & SGH, Pune

Dr. Shivani Vhora

Senior Resident, Department of Emergency Medicine, BJGMC & SGH, Pune

ABSTRACT

Background: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia encountered in emergency settings and is associated with significant morbidity and mortality. Understanding its clinical and epidemiological profile is essential for early diagnosis and optimal management. **Objective:** To study the clinical and epidemiological profile of patients presenting with atrial fibrillation to the emergency department of a tertiary care teaching hospital. **Methods:** A prospective observational study was conducted in the Department of Emergency Medicine at a tertiary care teaching hospital. A total of 64 adult patients (>18 years) diagnosed with atrial fibrillation were included after obtaining informed consent. Data were collected using structured case records, including demographic details, clinical presentation, vital parameters, risk factors, laboratory findings, and treatment modalities. Descriptive statistics were analyzed using SPSS version 25.0. **Results:** The majority of patients belonged to the 61–70 years age group (26.6%). Females constituted 60.9% of the study population. The most common presenting symptom was breathlessness (84.4%), followed by palpitations (62.5%) and chest pain (40.6%). Common comorbidities included rheumatic valvular heart disease (53.1%), hypertension (45.3%), and diabetes mellitus (25%). Alcohol use and smoking were reported in 25% and 23.4% of patients, respectively. Most patients (95.3%) were managed with antiarrhythmic drugs, with diltiazem being the most commonly used agent (79.7%), while 4.7% required synchronized cardioversion. **Conclusion:** Atrial fibrillation predominantly affects older adults and is commonly associated with rheumatic heart disease and hypertension in this population. Breathlessness and palpitations remain the most frequent presenting symptoms. Early recognition and management of modifiable risk factors are essential to improve patient outcomes.

KEYWORDS

Atrial Fibrillation, Emergency Medicine, Rheumatic Heart Disease, Rate Control

INTRODUCTION

Atrial fibrillation (AF) is a frequently encountered cardiac arrhythmia which may be either symptomatic or asymptomatic. 1 The typical symptoms of AF include tachycardia, palpitations, shortness of breath, weakness, angina pectoris-like symptoms, dizziness, and syncope. 2 The electrocardiographic hallmarks of AF are the absence of P-waves; irregular, chaotic waves; and inconsistent R–R intervals. 2 AF can develop from substrates formed from reentry, structural/electrical remodelling, and ectopic firing. 3 The pathophysiology of AF centers around 4 general types of disturbances that promote ectopic firing and reentrant mechanisms, and include the following: (1) ion channel dysfunction, (2) Ca²⁺-handling abnormalities, (3) structural remodelling, and (4) autonomic neural dysregulation. Aging, hypertension, valve disease, heart failure, myocardial infarction, obesity, smoking, diabetes mellitus, thyroid dysfunction, and endurance exercise training all cause structural remodeling. 4 Cardiac co-morbidities that are associated with AF include hypertension, coronary artery disease (CAD), valvular heart disease (VHD), congestive heart failure (CHF), cardiomyopathy, pericarditis, congenital heart disease (CHD) and cardiac surgery. Noncardiac comorbidities that are associated with AF include acute pulmonary embolism, chronic obstructive pulmonary disease (COPD), obstructive sleep apnea, hyperthyroidism and obesity. 5 This rhythm disturbances increase mortality and increase morbidity by precipitating heart failure (HF) and cardioembolic stroke and various thromboembolic conditions. 6

Study Rationale

By conducting this study on clinical and epidemiological profile of atrial fibrillation patients in emergency room of a tertiary care government hospital, researchers aim to identify risk factors, complications and areas for improvement in emergency care delivery. This knowledge will help to improve outcome of atrial fibrillation patients.

Study Objectives: (Primary and Secondary)

1. To study clinical profile of patients presenting with atrial fibrillation.
2. To study ECG changes of patients presenting with atrial fibrillation.
3. To study risk factors of patients presenting with atrial fibrillation.
4. To implement early appropriate management of atrial fibrillation depending on ECG.
5. To study complications associated with atrial fibrillation.

Study Design: Prospective Observational study

Study Population: Adult patients presenting with atrial fibrillation to emergency room

Subject Eligibility:

Inclusion Criteria:

1. All adults age more than 18 years.
2. Both male and female with atrial fibrillation
3. Patient who gave the consent.

Exclusion Criteria:

1. Trauma, burn, electrical injury patients.
2. Patients less than 18 years of age.
3. Patients presenting with cardiac arrest-Ventricular Fibrillation, Pulseless Ventricular Tachycardia, Asystole, Pulseless Electrical Activity

RESULT

Table-1. Age Wise Distribution of Study Participants

AGE GROUP	Frequency	Percent
21-30	1	1.6
31-40	8	12.5
41-50	8	12.5

51-60	12	18.8
61-70	17	26.6
71-80	15	23.4
81-90	1	1.6
91-100	2	3.1
Total	64	100.0

The participants ranged in age from 21 to 100 years. The largest proportion belonged to the 61–70 years group (26.6%, n=17), followed by the 71–80 years group (23.4%, n=15) and the 51–60 years group (18.8%, n=12). Both the 31–40 years and 41–50 years groups contributed equally (12.5%, n=8 each). A small proportion of participants were in the youngest age group of 21–30 years (1.6%, n=1), while 1.6% (n=1) were between 81–90 years, and 3.1% (n=2) were aged 91–100 years. Overall, the study included 64 participants.

Table-2. Sex Wise Distribution of Study Participants

SEX	Frequency	Percent
F	39	60.9
M	25	39.1
Total	64	100.0

Of the 64 participants, 39 (60.9%) were female and 25 (39.1%) were male. Thus, females constituted the majority of the study population.

Table-3. Symptoms Wise Distribution of Study Participants

SYMPTOMS	Frequency	Percent
BREATHLESSNESS	54	84.4
PALPITATION	40	62.5
CHEST PAIN	26	40.6
COUGH	9	14.1
PEDAL OEDEMA	9	14.1
ANY OTHER SYMPTOMS	6	9.4
SWEATING	6	9.4
VOMITING	5	7.8
WEAKNESS OF ANY LIMB	3	4.7
GIDDINESS	2	3.1

Among the study participants, the most frequently reported symptom was breathlessness, present in 54 individuals (84.4%), followed by palpitations in 40 participants (62.5%) and chest pain in 26 participants (40.6%). Less common symptoms included cough (14.1%), pedal oedema (14.1%), sweating (9.4%), and other miscellaneous symptoms (9.4%). A smaller proportion of participants reported vomiting (7.8%), weakness of any limb (4.7%), or giddiness (3.1%).

Table-4. Vital Wise Distribution of Study Participants

Vital	N	Minimum	Maximum	Mean	SD
PULSE	64	92	210	147.59	22.484
Systolic	63	80	180	118.7	18.803
Diastolic	63	60	100	76.349	8.8539
SPO2	64	0	100	94.203	12.754
RR	64	14	30	17.547	2.7368
BSL	64	98	435	152.14	55.77

The mean pulse rate among participants was 147.6 ± 22.5 beats per minute, with values ranging from 92 to 210. The mean systolic blood pressure was 118.7 ± 18.8 mmHg (range: 80–180), while the mean diastolic blood pressure was 76.3 ± 8.9 mmHg (range: 60–100). Oxygen saturation (SpO₂) had a mean of $94.2 \pm 12.8\%$, with values between 0 and 100. The mean respiratory rate was 17.5 ± 2.7 breaths per minute (range: 14–30). Blood sugar levels (BSL) varied widely, with a mean of 152.1 ± 55.8 mg/dL (range: 98–435).

Table-5. Risk Factors Wise Distribution of Study Participants

	Frequency	Percent
HYPERTENSION	29	45.3
RVHD	34	53.1
DIABETES	16	25.0
IHD	14	21.9
HYPOTHYROIDISM	5	7.8
COPD	3	4.7

The most common comorbidity among participants was rheumatic valvular heart disease (RVHD), observed in 34 individuals (53.1%). Hypertension was present in 29 participants (45.3%), while diabetes mellitus and ischemic heart disease (IHD) were noted in 16 (25.0%) and 14 (21.9%) participants, respectively. Less frequent comorbidities included hypothyroidism (7.8%) and chronic obstructive pulmonary

disease (COPD) (4.7%).

Table-7. Addiction Wise Distribution of Study Participants

Addiction	Frequency	Percent
Alcohol	16	25.0
Smoking	15	23.4

Among the study population, 16 participants (25.0%) reported alcohol use, while 15 participants (23.4%) reported smoking.

		Frequency	Percent
Sodium	Normal	38	59.4
	Abnormal	26	40.6
Potassium	Normal	39	60.9
	Abnormal	25	39.1

Sodium levels were normal in 38 participants (59.4%) and abnormal in 26 participants (40.6%). Similarly, potassium levels were within the normal range in 39 participants (60.9%), while 25 participants (39.1%) had abnormal values.

Table-8. Treatment Provided Wise Distribution of Study Participants

Treatment Provided	Frequency	Percentage
ANTIARRHYTHMIC	61	95.3
CARDIOVERSION	3	4.7

The majority of participants (95.3%, n=61) were managed with antiarrhythmic medications, while a smaller proportion (4.7%, n=3) underwent cardioversion.

Table-9. Rate Control of Atrial Fibrillation Wise Distribution of Study Participants

	Frequency	Percent
DIGOXIN	6	9.4
DILTIAZEM	51	79.7
METEXEL AND AMIODARONE	1	1.6
SYNCHRONISED CARDIOVERSION	3	4.7

Among the treatment options, diltiazem was the most frequently used, administered to 51 participants (79.7%). Digoxin was given to 6 participants (9.4%), while a combination of metexel and amiodarone was used in 1 participant (1.6%). In addition, synchronized cardioversion was performed in 3 participants (4.7%).

DISCUSSION

Age Distribution

The study sample ranged from 21 to 100 years, with the largest proportion (26.6%) in the 61–70 years group and a significant portion (23.4%) in 71–80 years.

Literature shows AF prevalence and incidence rise sharply with age, especially after 65 years, with the majority of AF patients between 65 and 85 years old. For example, prevalence increases from <1% under 50 years to about 12% in those ≥80 years. (7,8,9)

Gender Distribution

In your data, females formed 60.9% of participants and males 39.1%.

Traditionally, AF is reported to affect men slightly more, but recent findings indicate that when adjusted for height, women may have a higher risk of developing AF and experience worse outcomes. (10,11)

Symptoms

The main symptoms reported were breathlessness (84.4%), palpitations (62.5%), and chest pain (40.6%), with less frequent reports of cough, pedal edema, sweating, vomiting, weakness, and giddiness.

Literature corroborates that the common symptoms include shortness of breath, palpitations, chest pain, fatigue, dizziness, and sometimes asymptomatic presentations. Symptom severity varies by type (paroxysmal vs persistent) and individual patient factors. (12,13,14)

Vital Signs and Measurements

Mean pulse was high at 147.6 bpm (range 92–210), reflecting tachyarrhythmia common in AF. Blood pressure averages were 118.7/76.3 mmHg, with mean oxygen saturation at 94.2%.

These vitals align with typical AF presentations, where tachycardia is common; blood pressure can vary, and oxygen saturation is generally

normal unless complicated by comorbidities.(15)

Risk Factors and Comorbidities

Common comorbidities were rheumatic valvular heart disease (53.1%), hypertension (45.3%), diabetes (25%), ischemic heart disease (21.9%), hypothyroidism (7.8%), and COPD (4.7%).

Modifiable risk factors like hypertension, obesity, and clinical comorbidities including COPD and cardiovascular disease substantially contribute to AF incidence and recurrence. Hypertension and obesity are frequently highlighted as leading modifiable risks. (8,16,17)

Social factors and genetic predisposition also play roles but impact different age and risk groups variably.(16)

Addictions (Alcohol and Smoking)

In your study, 25% had alcohol use and 23.4% smoked. Recent cohorts show inconsistent associations between alcohol use and AF incidence in older adults; moderate or heavy alcohol intake did not significantly raise risk in some studies, though heavy drinking remains a general cardiovascular risk factor.(18) Smoking is recognized as a modifiable risk factor in AF management guidelines.(17)

Treatment Provided

Most patients (95.3%) received antiarrhythmic medications, predominantly diltiazem (79.7%), with some receiving digoxin, amiodarone, or cardioversion.

Guidelines recommend rate or rhythm control strategies, including calcium channel blockers (like diltiazem) and beta-blockers for rate control. Digoxin is a secondary option due to side effects. Cardioversion is reserved for hemodynamically unstable patients or certain rhythm control cases.(15)

Anticoagulation therapy is critical for stroke prevention based on risk stratification using scores like CHA₂DS₂-VASc.(15)

CONCLUSION

This study highlights a clinical profile of atrial fibrillation patients predominantly older adults with a significant burden of rheumatic valvular heart disease, hypertension, and diabetes in a regional Indian context. The predominance of female patients may suggest demographic or disease pattern shifts requiring further research. Symptomatology matched broadly accepted clinical features of AF, emphasizing breathlessness and palpitations. The study affirms the significance of modifiable risk factors such as hypertension, diabetes, smoking, and alcohol consumption in AF pathogenesis.

Treatment practices aligned with international guidelines emphasizing rate control, with diltiazem as the preferred agent and application of cardioversion in unstable patients

Overall, these findings contribute valuable regional epidemiological and clinical insights into AF and support the need for targeted prevention, optimized treatment, and patient education tailored to local disease patterns and resources.

REFERENCES

1. Mandal RN, Mishra AK, Mandal EL. Clinical and Etiological Profile of Patients with Atrial Fibrillation (AF): Analysis and implications. Janaki Medical College Journal of Medical Science. 2016;4(1):5-12.
2. Willems S, Gunawardene MA, Eickholt C, Hartmann J, Schmoeckel M, Schaeffer B. Medical, interventional, and surgical treatment strategies for atrial fibrillation. Deutsches Ärzteblatt International. 2022 Jan;119(1-2):11.
3. Young LJ, Antwi-Boasiako S, Ferrall J, Wold LE, Mohler PJ, El Refaey M. Genetic and non-genetic risk factors associated with atrial fibrillation. Life sciences. 2022 Jun 15;299:120529.
4. Andrade J, Khairy P, Dobrev D, Nattel S. The clinical profile and pathophysiology of atrial fibrillation: relationships among clinical features, epidemiology, and mechanisms. Circulation research. 2014 Apr 25;114(9):1453-68.
5. Reddy R, Srikanth K, Prasad S, SS GP. To study the prevalence and clinical profile of chronic atrial fibrillation in hospitalized patients. Journal of Health and Allied Sciences NU. 2014 Jun;4(02):017-20.
6. Dhungel S, Laudari S. Clinical Profile of Atrial Fibrillation in a Tertiary Hospital in Central Nepal. Chest. 2017;6(3.9):0.
7. Feinberg WM, Blackshear JL, Laupacis A, Kronmal R, Hart RG. Prevalence, age distribution, and gender of patients with atrial fibrillation. Arch Intern Med. 1995 Mar 13;155(5):469-73.
8. Armar DO, et al. Age-specific atrial fibrillation incidence, attributable risk factors and outcomes. Eur Heart J. 2021 Aug;42(23):2348-2357.
9. Albert CM, et al. Sex Differences and AFib: New Study Flips Conventional Wisdom. JAMA Cardiol. 2023 Apr 11.
10. Rienstra M, et al. Symptoms and Functional Status of Patients with Atrial Fibrillation. Eur Heart J. 2012 Jun 12;33(21):2504-2511.

11. Wang N, et al. Acquired risk factors and incident atrial fibrillation according to age and genetic risk groups. Eur J Cardiovasc Nurs. 2023 Dec 14;44(47):4982-4991.
12. Murphy NF, et al. Management of modifiable risk factors and comorbidities in atrial fibrillation. Eur J Cardiovasc Nurs. 2024 Mar 12;23(2):169-177.
13. Voskoboinik A, et al. Alcohol intake and incident atrial fibrillation in older adults: A community cohort study. PLoS One. 2024 Nov 21;14(1):e0314207.
14. January CT, et al. 2019 AHA/ACC/HRS focused update on atrial fibrillation. Circulation. 2019;139(10):e125-e151.
15. Mayo Clinic Staff. Atrial fibrillation - Symptoms and causes. Mayo Clinic. 2024 Mar 8.
16. Al-Khatib SM, et al. Treatment / Management of Atrial Fibrillation. StatPearls. 2023 Apr 26.
17. Kotecha D, et al. Atrial fibrillation and heart failure: what should we do? Eur Heart J. 2016 May 7;37(31):2462-74.
18. Kirchhof P, et al. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation. Eur Heart J. 2020 Aug 21;42(5):373-49.