International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Study of Clinical Profile and Echocardiographic Findings in Atrial Fibrillation Patients in a Tertiary Care Hospital in Ahmedabad

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Abstract: ***Background: Atrial fibrillation (AF) is a common cardiac arrhythmia with significant morbidity, including stroke and heart failure. Transthoracic echocardiography (TTE) is crucial for evaluating cardiac structural abnormalities in AF. Objective: To evaluate the clinical and echocardiographic profile of patients with AF and correlate these findings with underlying etiologies and risk factors. Methods: A cross - sectional observational study was conducted at a tertiary care hospital in Ahmedabad from 2023 to 2025.100 adult patients with ECG - confirmed AF were enrolled. Demographic and clinical data were collected, and all patients underwent detailed TTE. Associations between echocardiographic parameters and clinical variables were analyzed. Results: Mean age was 40.2 years; 61% were female. Rheumatic heart disease (RHD) was the most common etiology (72%). Palpitations (80%) and breathlessness (74%) were frequent symptoms. TTE showed left atrial (LA) enlargement in 86%, with severe LA enlargement significantly associated with LA thrombus (36%, p = 0.007). Mitral stenosis was found in 72%, and 27% had reduced left ventricular ejection fraction (LVEF). Conclusion: RHD remains the primary cause of AF in young Indian patients, contributing to severe LA enlargement and valvular disease. TTE is essential for risk assessment and guiding anticoagulation decisions.***

Keywords: Atrial fibrillation, Transthoracic echocardiography, Rheumatic heart disease, Left atrial enlargement, Thromboembolic risk

1. Introduction

Atrial fibrillation (AF) is the most frequently encountered sustained arrhythmia globally. It affects over 8 million people in India and contributes significantly to stroke and heart failure risk. In developing countries like India, the disease manifests at a younger age, often due to rheumatic heart disease (RHD).

Transthoracic echocardiography (TTE) is a cornerstone in the diagnostic and management pathway for AF, allowing assessment of chamber size, valvular pathology, and thrombus formation.

This study was conducted to assess the clinical features and echocardiographic abnormalities in AF patients in a tertiary care hospital in Ahmedabad, aiming to identify disease patterns and improve risk stratification strategies.

2. Aims and Objectives

- To evaluate the clinical profile of patients with atrial fibrillation.
- To assess echocardiographic findings in AF patients.
- To correlate echocardiographic abnormalities with etiological factors and thromboembolic risk.

3. Materials and Methods

1) Study Design: Cross - sectional observational study

2) Duration: 2023–2025

3) Setting: A Tertiary Care Hospital in Ahmedabad

4) Sample Size: 100 patients

Inclusion Criteria:
- Age ≥ 18 years
- Confirmed diagnosis of AF on ECG (paroxysmal, persistent, or permanent)

Exclusion Criteria:
- Incomplete data
- Refusal to consent

5) Data Collection:
- Demographic and clinical variables: age, sex, symptoms, comorbidities, lifestyle factors
- Investigations: CBC, renal function, thyroid profile, lipid profile, ECG, chest X – ray
- TTE: Performed per ASE guidelines using [insert machine model]; assessed LA size, LVEF, valvular lesions, RWMA, thrombus, pulmonary hypertension

Statistical Analysis:
Data were analyzed using SPSS v23.0. Chi - square and unpaired t - tests were used to determine significance ($p < 0.05$).

4. Results

Table 1: Baseline Characteristics

Variable	Value
Mean Age (years)	40.2 ± [SD]
Female (%)	61
RHD (%)	72
HTN (%)	12
CAD (%)	4

Table 2: Echocardiographic Findings

Parameter	Prevalence (%)
LA Enlargement	86
Mitral Stenosis	72
Reduced LVEF	27
RV Dysfunction	22
LA Thrombus	9

5. Discussion

This study reveals that RHD is still a dominant cause of AF in India, presenting at a younger age. Most patients were symptomatic, predominantly with palpitations and dyspnea. TTE provided essential insights into cardiac pathology, especially LA enlargement and thrombus formation.

The significant association of LA size with thrombus formation highlights the importance of early echocardiographic screening for anticoagulation decisions. LVEF reduction and RV dysfunction also indicated advanced disease.

Conclusion

AF in India predominantly affects younger individuals due to RHD. Echocardiographic findings such as LA enlargement and mitral stenosis are prevalent and clinically significant. Routine TTE is indispensable for evaluating thromboembolic risk and guiding management strategies in AF patients.

6. Limitations

- Single - center, cross - sectional design
- Absence of transesophageal echocardiography may have underestimated LA thrombus
- Limited sample size and lack of long - term follow – up

7. Implications and Recommendations

- Strengthen RHD screening and secondary prophylaxis
- Incorporate routine TTE for AF patients in endemic regions
- Further multicentric longitudinal studies are recommended

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