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CLINICO-ETIOLOGICAL PROFILE OF ATRIAL FIBRILLATION IN A TERTIARY CARE HOSPITAL AND ITS CORRELATION TO ATRIAL SIZE

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Abstract

Background: Atrial fibrillation (AF) is a major global health concern with diverse etiologies and varying presentations. It is associated with significant morbidity, and its severity can be influenced by structural cardiac changes, notably left atrial (LA) enlargement.

Objective: To study the clinical and etiological spectrum of atrial fibrillation and its correlation with left atrial size in a tertiary care setting.

Methods: This cross-sectional analytical study included 118 patients with electrocardiographically confirmed AF. All patients underwent detailed clinical evaluation, electrocardiography, and echocardiography focusing on LA size. Etiological factors and associated complications were documented and analyzed.

Results:

- Mean age: 68.53 years
- Male: 60.2%
- Symptoms: Dyspnea (39.0%), palpitations (34.7%)
- Etiologies: Rheumatic heart disease (RHD) 50.8%, hypertension 45.8%, coronary artery disease (CAD) 23.7%
- Mean LA size: 45.93 mm; LA enlargement in 79.7%
- Significant correlations: LA size with RHD ($p = 0.042$), oxygen saturation ($p < 0.001$), and heart failure ($p = 0.002$)
- Common complications: Heart failure (27.1%), stroke (14.4%)

Conclusion: RHD remains a predominant cause of AF in this population. LA size is a strong prognostic marker with significant implications for clinical outcomes. Echocardiographic evaluation is essential for risk stratification and management of AF.

Keywords: Atrial fibrillation, Left atrial enlargement, Rheumatic heart disease, Echocardiography, Systemic Hypertension, Stroke, Heart failure.

INTRODUCTION

Atrial fibrillation is the most common sustained cardiac arrhythmia worldwide, contributing to increased risk of stroke, heart failure, and overall cardiovascular mortality. In India, etiological patterns differ from developed countries, with rheumatic heart disease still playing a significant role. Structural changes, particularly LA enlargement, may provide prognostic insights. This study aims to evaluate these dimensions.

AIMS AND OBJECTIVES

Aim:

To evaluate the clinical and etiological profile of atrial fibrillation and its correlation with left atrial size.

Objectives:

- Assess demographic and clinical characteristics of patients with AF
- Determine etiological factors associated with AF
- Measure LA size using echocardiography

- Correlate LA size with clinical features, etiologies, and complications

MATERIALS AND METHODS

- **Design:** Cross-sectional observational study
- **Setting:** Department of General Medicine, BMCRC, Ballari
- **Sample Size:** 118 patients with ECG-confirmed AF
- **Investigations:** Detailed history, clinical examination, ECG, 2D echocardiography
- **Statistical Analysis:** Descriptive and inferential analysis; p-value < 0.05 considered significant

RESULTS

Table 1: Age Distribution

- Mean Age: 68.53 years
- Most common age group: 61–70 years

Table 2: Gender Distribution

- Male: 71 (60.2%)
- Female: 47 (39.8%)

Figure 1: Gender Distribution (Pie Chart)

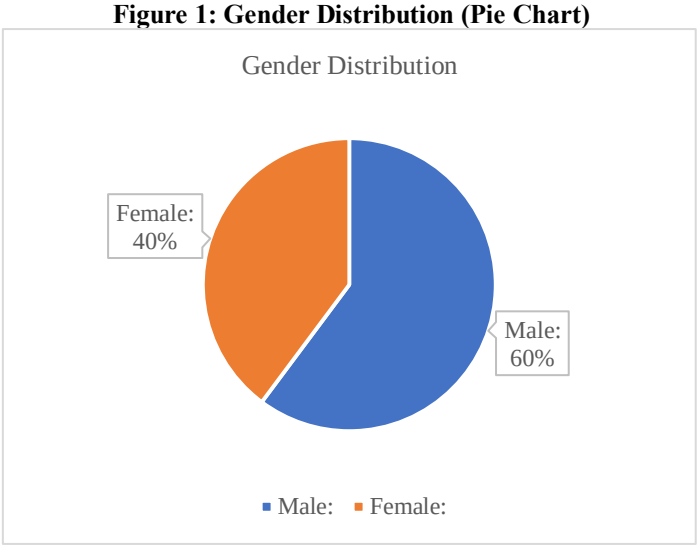

Table 3: Clinical Symptoms in AF Patients

Symptom	Frequency	Percentage
Dyspnea	46	39.0%
Palpitations	41	34.7%
Fatigue	19	16.1%
Chest Pain	12	10.2%
Syncope	5	4.2%

Table 4: Etiological Distribution

Etiology	Frequency	Percentage
Rheumatic Heart Disease	60	50.8%

Etiology	Frequency	Percentage
Hypertension	54	45.8%
Coronary Artery Disease	28	23.7%
Thyrotoxicosis	5	4.2%
Cardiomyopathy	3	2.5%
COPD	2	1.7%

Figure 2: Etiological Distribution

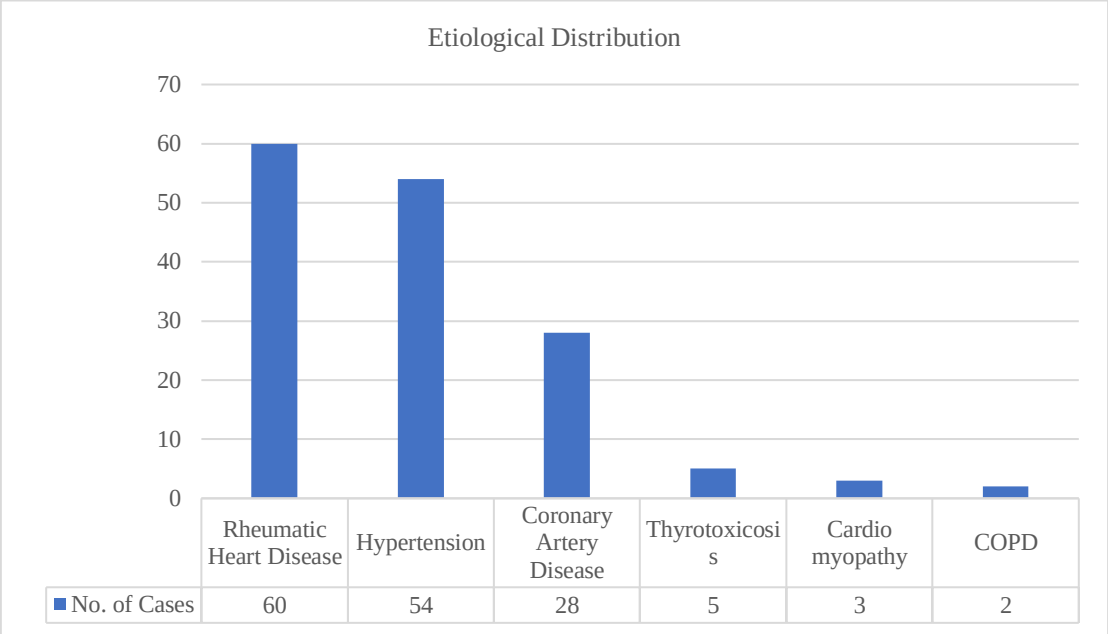

Table 5: LA Size (Echocardiographic Findings)

- Mean LA Size: 45.93 mm
- LA Enlargement Present: 79.7%

Figure 3: Distribution of LA Enlargement

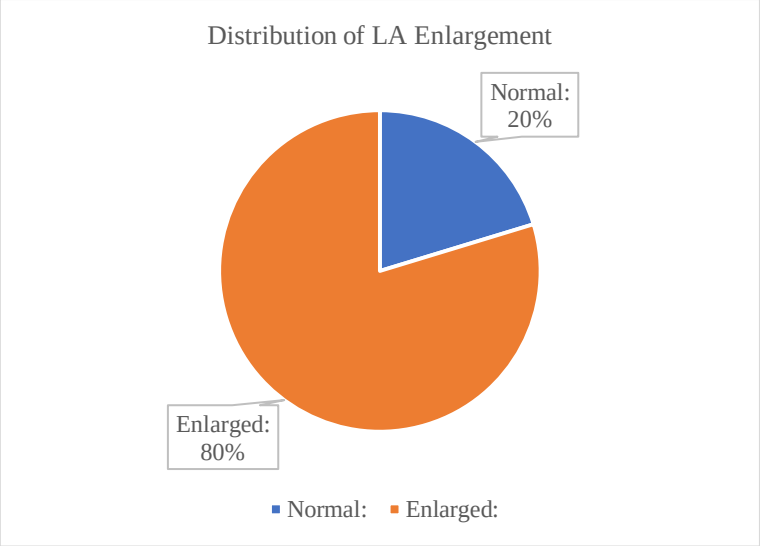

Table 6: Complications

Complication	Frequency	Percentage
Heart Failure	32	27.1%
Stroke	17	14.4%
No Complication	41	34.7%

DISCUSSION

This study affirms that atrial fibrillation in this population remains strongly linked to RHD, even as hypertension and CAD are rising contributors. Most patients had LA enlargement, underscoring the structural adaptation to chronic atrial strain and its prognostic role.

Significant associations were observed between LA size and clinical markers like oxygen saturation, as well as with complications such as heart failure. As LA size increased, so did the incidence of adverse events. This supports international findings that LA diameter is a surrogate for AF burden and severity.

The high prevalence of RHD reflects ongoing public health challenges in rheumatic fever control. Moreover, a substantial portion of patients with complications had severe LA enlargement, highlighting the clinical utility of echocardiography.

CONCLUSION

- Atrial fibrillation in the studied cohort had a predominant rheumatic etiology.
- LA enlargement was a frequent finding and significantly correlated with adverse clinical outcomes.
- Routine echocardiographic assessment, especially of LA size, is vital for risk stratification.
- Preventive strategies targeting RHD and hypertension are essential in mitigating AF burden.

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