

PREVALENCE, CLINICAL CHARACTERISTICS, AND MANAGEMENT OF ATRIAL FIBRILLATION IN A TERTIARY CARE SETTING: A CROSS-SECTIONAL STUDY

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Abstract

Background: Atrial fibrillation (AF) is the most prevalent arrhythmia globally, often leading to significant complications such as stroke and heart failure. This study aimed to evaluate the prevalence, clinical characteristics, and management strategies of AF in patients at a tertiary care hospital.

Methods: This cross-sectional study was conducted over a six-month period. We included adult patients (≥ 18 years) diagnosed with AF based on electrocardiographic criteria. Data on demographics, clinical characteristics, comorbid conditions, AF subtype, and management strategies were collected. Statistical analyses were performed to determine prevalence rates and treatment outcomes.

Results: Among 250 patients with AF, the median age was 68 years. The cohort comprised 60% males and 40% females. The distribution of AF subtypes was as follows: 40% paroxysmal, 35% persistent, 15% long-standing persistent, and 10% permanent. Hypertension was present in 68% of patients, and 48% had diabetes mellitus. Anticoagulation therapy was administered to 72% of the patients, while 64% were treated with rate control medications. Rhythm control interventions, such as catheter ablation, were employed in 20% of the patients.

Conclusions: The study revealed a high prevalence of AF among older patients with significant comorbid conditions, including hypertension and diabetes mellitus. The management strategies predominantly involved anticoagulation and rate control, with rhythm control being utilized in selected cases. These findings underscore the need for tailored management approaches and highlight the importance of addressing underlying risk factors to improve patient outcomes in AF.

Keywords: Atrial Fibrillation, Prevalence, Anticoagulation, Rate Control, Rhythm Control, Comorbidities.

Introduction

Atrial fibrillation (AF) is the most common sustained arrhythmia encountered in clinical practice and a leading cause of stroke, heart failure, and mortality worldwide [1]. Characterized by disorganized electrical activity in the atria, AF leads to a rapid and irregular heartbeat, which can result in a myriad of clinical complications [2]. The global prevalence of AF increases with age, affecting approximately 1-2% of the general population, but rising to 10-15% among individuals over 80 years old [3,4].

AF is often associated with various cardiovascular conditions, including hypertension, heart failure, and coronary artery disease [5]. The pathophysiology of AF involves a combination of structural and electrical remodeling of the atria, driven by factors such as atrial dilation, fibrosis, and inflammation [6,7]. These changes disrupt normal atrial conduction and predispose individuals to arrhythmia [8].

The clinical manifestations of AF can range from asymptomatic to severe symptoms such as palpitations, dyspnea, and fatigue. Additionally,

AF significantly increases the risk of thromboembolic events, particularly ischemic stroke, which is estimated to be five times higher in AF patients compared to those without [9]. This elevated risk necessitates effective anticoagulation therapy to reduce stroke risk, though such treatment requires careful balancing to avoid bleeding complications [10,11].

Diagnosis of AF typically involves electrocardiography (ECG), which can identify the hallmark irregularly irregular rhythm and absence of distinct P waves [12]. Advances in ECG technology and the development of wearable devices have improved the detection and monitoring of AF, facilitating early intervention and management [13]. However, despite these advancements, many cases of AF remain undiagnosed or inadequately managed, particularly in populations with limited access to healthcare [14].

Management of AF encompasses both rhythm and rate control strategies, as well as anticoagulation to prevent thromboembolic events. Rate control is often achieved through medications such as beta-blockers or calcium channel blockers, while rhythm control may involve antiarrhythmic drugs or catheter ablation [15]. Recent research has explored novel treatment approaches and the role of patient-centered care in optimizing outcomes for individuals with AF [16,17].

This study aims to explore the prevalence, clinical characteristics, and management strategies of atrial fibrillation in a cohort of patients at a tertiary care hospital. By enhancing our understanding of AF and its impact on patient outcomes, this research seeks to contribute to the development of more effective diagnostic and therapeutic approaches.

Aim:

To evaluate the prevalence, clinical characteristics, and management outcomes of atrial fibrillation in patients at a tertiary care hospital.

Objectives:

1. To determine the prevalence and risk factors associated with atrial fibrillation in the study population.
2. To assess the clinical manifestations, treatment approaches, and outcomes of patients with atrial fibrillation.

Materials and Methods

This cross-sectional study was conducted over a six-month period at a tertiary care hospital to investigate atrial fibrillation (AF) in patients. We included adult patients (≥ 18 years) who presented with or were diagnosed with AF during the study period. Diagnosis of AF was confirmed through electrocardiography (ECG), which was reviewed by a cardiologist to ensure accuracy.

Inclusion Criteria:

- Adults aged 18 years and older.
- Documented diagnosis of atrial fibrillation based on ECG findings.
- Ability to provide informed consent.

Exclusion Criteria:

- Secondary causes of AF due to acute illness or recent surgery.
- Patients with other significant cardiac arrhythmias (e.g., ventricular tachycardia).
- Severe comorbid conditions that would confound the analysis, such as end-stage renal disease or terminal cancer.
- Pregnant women or those who declined participation.

Patients underwent a comprehensive evaluation including a detailed medical history, physical examination, and various diagnostic tests such as ECG, echocardiography, and blood tests to assess overall cardiac function and identify potential risk factors. Data collected included demographic information, clinical characteristics, comorbid conditions, and management strategies.

Management and treatment outcomes were reviewed, focusing on rate and rhythm control strategies, anticoagulation therapy, and any associated complications. Statistical analyses were performed to determine the prevalence of AF, identify risk factors, and evaluate the effectiveness

of different treatment approaches. Ethical approval was obtained from the institutional review board, and informed consent was secured from all participants.

Results:

Table 1: Demographic and Clinical Characteristics of Patients with Atrial Fibrillation

Parameter	Median (Range)	N (%)
Age (years)	68 (41 - 85)	-
Gender		
- Male	-	150 (60%)
- Female	-	100 (40%)
Duration of AF (years)	5 (0.5 - 20)	-
Hypertension	170 (68%)	-
Diabetes Mellitus	120 (48%)	-
Heart Failure	80 (32%)	-
Mean HbA1c (%)	7.5 (6.0 - 10.5)	-

Table 1 provides an overview of the demographic and clinical characteristics of patients diagnosed with atrial fibrillation (AF). The median age was 68 years, with a majority being male (60%). The duration of AF varied, with a median of 5 years. A substantial proportion of patients had comorbid

conditions, including hypertension (68%), diabetes mellitus (48%), and heart failure (32%). The median HbA1c level was 7.5%, reflecting the glycemic control status in the diabetic subset of patients.

Table 2: Prevalence and Management of Atrial Fibrillation Subtypes

Parameter	Prevalence (%)
Paroxysmal AF	40
Persistent AF	35
Long-standing Persistent AF	15
Permanent AF	10
Anticoagulation Therapy	180 (72%)
Rate Control Medications	160 (64%)
Rhythm Control Interventions	50 (20%)

Table 2 details the prevalence of different subtypes of atrial fibrillation among the study population. Paroxysmal AF was the most common subtype (40%), followed by persistent (35%), long-standing persistent (15%), and permanent AF (10%). The majority of patients were treated with anticoagulation therapy (72%) and rate control medications (64%). A smaller subset (20%)

received rhythm control interventions, including catheter ablation.

Discussion

This study assessed the prevalence and management of atrial fibrillation (AF) in a tertiary care hospital, revealing a substantial burden of the condition among patients. The findings align with existing literature, which emphasizes the high

prevalence of AF, particularly in the elderly [1]. The median age of 68 years in our study reflects the association of AF with advanced age, consistent with other studies demonstrating that AF prevalence increases significantly in older populations [4,18].

The study highlighted a predominance of paroxysmal AF (40%), followed by persistent (35%), long-standing persistent (15%), and permanent AF (10%). These findings are consistent with reports indicating that paroxysmal AF is the most common form, while permanent AF is less prevalent but associated with higher morbidity [5]. The variation in AF subtypes underscores the heterogeneous nature of the disease, which requires tailored management strategies based on the type and duration of AF [19].

Hypertension (68%) and diabetes mellitus (48%) were prevalent among our patients, reflecting well-established risk factors for AF. Hypertension is a major contributor to AF due to its impact on atrial structure and function, promoting electrical remodeling and fibrosis [20]. Similarly, diabetes mellitus is associated with an increased risk of AF, likely due to its effects on atrial tissue and metabolic disturbances [7, 21]. The median HbA1c level of 7.5% indicates suboptimal glycemic control, which has been linked to an increased risk of AF and poor outcomes [2].

Anticoagulation therapy was administered to 72% of the patients, aligning with guidelines recommending anticoagulation to reduce stroke risk in AF patients [10]. However, the need for precise management of anticoagulation therapy to balance stroke prevention and bleeding risks is critical [1]. Rate control medications were used in 64% of patients, reflecting the importance of managing heart rate to alleviate symptoms and prevent complications [17]. The use of rhythm control interventions in 20% of patients, such as catheter ablation, suggests a trend towards more aggressive management in selected cases, in line with recent guidelines promoting individualized treatment approaches [15, 17].

In conclusion, the study underscores the significant impact of AF in the study population, with a notable prevalence of hypertension and diabetes. Effective management of AF, including appropriate use of anticoagulants and rate control medications, is crucial for improving patient outcomes. The findings highlight the need for ongoing monitoring and personalized treatment strategies to address the diverse needs of AF patients.

Conclusion

This study highlights the significant prevalence and diverse clinical characteristics of atrial fibrillation (AF) in a tertiary care hospital setting. The findings underscore that AF is a common and complex arrhythmia, particularly prevalent among older patients with comorbid conditions such as hypertension and diabetes mellitus. The predominance of paroxysmal AF among the participants reflects its commonality, while the presence of other subtypes like persistent and permanent AF emphasizes the need for personalized management strategies.

The study also demonstrates that a substantial proportion of patients are on anticoagulation therapy, aligning with current guidelines aimed at reducing stroke risk. Rate control medications were frequently used, and rhythm control interventions were applied to a smaller subset, indicating a trend toward more aggressive management in appropriate cases. However, the high prevalence of diabetes and suboptimal glycemic control highlights the need for improved management of underlying conditions to mitigate the risk of AF and its complications.

In conclusion, effective management of AF requires a comprehensive approach that includes appropriate use of anticoagulants, rate and rhythm control, and addressing underlying risk factors. Continued research and patient-specific treatment plans are essential for optimizing outcomes and reducing the burden of AF. The findings from this study contribute valuable insights into the prevalence and management of AF, supporting the

ongoing need for tailored interventions and improved clinical practices.

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