



ADVANCES IN UNDERSTANDING ATRIAL FIBRILLATION: A NARRATIVE REVIEW

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ABSTRACT

Atrial fibrillation (AF) risk factors are multifaceted, encompassing hypertensive heart disease, coronary heart disease, rheumatic heart disease, and more. Hypertension and CHD are prevalent in developed nations, with hypertension notably increasing AF risk. Classification of AF distinguishes paroxysmal, persistent, long-standing persistent, and permanent forms, highlighting the progressive nature of the condition. Subclinical or occult AF may lack apparent symptoms. A comprehensive evaluation of AF includes medical history, associated conditions, and reversible causes, followed by physical examination and diagnostic tests. Initial management with the ABC pathway involves anticoagulation, symptom management, and assessing cardiovascular risk. Long-term management includes early follow-up, thromboembolism prevention, addressing AF recurrence, and rate or rhythm control decisions. Regular follow-up and monitoring complete the care for AF patients.

KEYWORDS : Atrial Fibrillation, Risk Factors, Initial Management, Long-Term Management

INTRODUCTION

Atrial fibrillation (AF) presents a formidable challenge in the field of cardiac health, characterized by irregular heart rhythms disrupting normal functioning. An exploration of AF's epidemiology reveals a complex interplay of factors influencing its occurrence, demanding a holistic understanding. The global landscape of AF's frequency paints a worrisome picture, with evidence from across continents indicating a rising number of affected individuals. Age stands out as a significant factor, with AF's occurrence increasing notably as individuals grow older. However, geography and genetics intertwine, shaping unique prevalence patterns. AF's onset follows a choreography of time and risk, as longitudinal studies uncover the intricate relationship between age and AF incidence, highlighting elevated risks with advancing years (1).

Methods

In conducting a narrative review of atrial fibrillation (AF), we adopted a comprehensive approach to synthesize existing knowledge. Systematic searches were performed in PubMed and Embase databases using Medical Subject Headings (MeSH) terms such as 'Atrial Fibrillation,' 'Epidemiology,' 'Risk Factors,' and 'Prevalence.' A stringent screening process was applied to identify relevant studies published from inception to the present. Inclusion criteria encompassed studies on AF epidemiology, its associations with demographic factors, and prevalence patterns across diverse populations. Exclusion criteria included non-English language studies and those with methodological flaws. The selected studies underwent meticulous data extraction, enabling the exploration of age-related trends, gender disparities, and geographic variations in AF prevalence.

Risk Factors

A deeper exploration of the risk factors associated with atrial fibrillation (AF) unveils a complex tapestry of underlying conditions contributing to its onset. Notably, hypertensive heart disease (2) and coronary heart disease (CHD) (3) prominently feature in developed nations, with other factors also playing a significant role in different settings.

Hypertensive Heart Disease: This condition assumes a central role in AF, with studies indicating a 1.42-fold increase in AF risk for individuals with a history of hypertension (2). Its wide prevalence in the general population establishes it as a primary underlying disorder in AF.

Coronary Heart Disease (CHD): In cases where AF is linked to CHD, it often occurs as a complication of acute myocardial infarction or heart failure (3). Acute myocardial infarction-triggered AF is typically transient, while chronic stable CHD exhibits a lower incidence of AF.

Rheumatic Heart Disease: While the prevalence of rheumatic heart disease has diminished, it remains significantly associated with AF, particularly in developing regions.

Chronic AF: The associations with hypertensive heart disease (2) and CHD (3) extend to chronic AF, including its paroxysmal form. These factors underline the importance of managing chronic diseases in preventing AF.

Valvular Heart Disease: Conditions causing significant stenosis or regurgitation, such as mitral valve prolapse and rheumatic heart disease, consistently correlate with AF development. Age and left atrial dimension emerge as prominent risk factors.

Heart Failure: AF and heart failure often coexist, with each condition potentially predisposing to the other.

Obstructive Sleep Apnea: An emerging correlation links obstructive sleep apnea with AF (4). Interventions targeting sleep apnea have shown promise in reducing AF recurrence, highlighting the importance of addressing underlying sleep disorders in AF management.

Classification and Terminology

Understanding the classification of atrial fibrillation (AF) offers valuable insights into its dynamic nature and clinical presentation. Guidelines established in 2014 by the American Heart Association, American College of Cardiology, and Heart Rhythm Society provide a framework for categorizing AF based on its duration and presentation (5).

Paroxysmal AF: This form of AF is characterized by self-terminating or intermittent episodes that resolve spontaneously or with intervention within seven days of onset. The frequency of recurrences varies, shaping the patient's

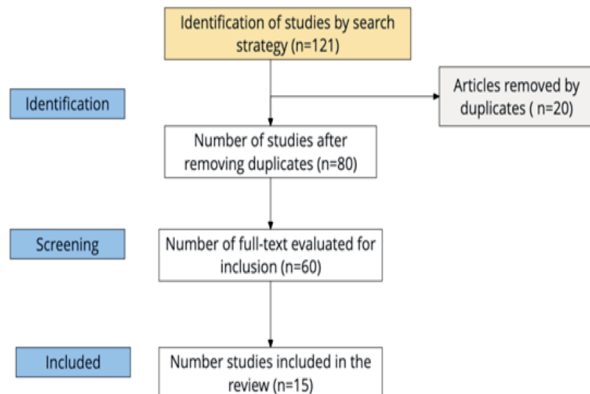


Figure 1. PRISMA.

clinical course.

Persistent AF: In contrast, persistent AF continues beyond seven days and typically requires pharmacologic or electrical cardioversion to restore sinus rhythm. While patients with persistent AF may experience episodes of paroxysmal AF later, the condition generally evolves as a progressive disease.

Long-standing Persistent AF: This term designates AF that endures for more than 12 months, highlighting its chronic nature and complex management.

Permanent AF: When patients and clinicians jointly decide to forgo rhythm control strategies, the term "permanent AF" is applied. The patient's clinical condition, preferences, and available therapeutic options influence this determination, which may evolve over time.

Subclinical or Occult AF: This discreet form of AF often lacks overt symptoms and may be discovered incidentally in the context of thromboembolic events, acute heart failure exacerbations, or during routine electrocardiograms performed for unrelated purposes.

Valvular AF: This category encompasses AF occurring in patients with moderate to severe mitral stenosis (7), placing them at an elevated risk of stroke compared to those without this valvular condition.

Evaluation

A comprehensive evaluation of atrial fibrillation (AF) involves a thorough assessment that encompasses the patient's medical history, a physical examination, and a range of diagnostic tests.

Medical History: The patient's medical journey begins with a detailed history, including the onset, potential triggers, frequency, duration, severity, and qualitative characteristics of AF episodes (8). Previous supraventricular arrhythmias are also considered to understand the patient's arrhythmic profile.

Associated Conditions: The evaluation includes a focus on associated conditions such as cardiovascular disease (9), cerebrovascular disease, diabetes, hypertension (9), chronic obstructive pulmonary disease, and obstructive sleep apnea (4). This provides essential context for understanding the underlying mechanisms and potential exacerbating factors contributing to AF.

Reversible Causes: Potentially reversible causes, such as hyperthyroidism or unhealthy alcohol use, are assessed to inform the overall evaluation.

Physical Examination: The physical examination concentrates on cardiovascular and associated conditions (9). It aims to detect heart murmurs, pulse abnormalities, and signs of heart failure. Notably, AF's irregularly irregular pulse may result in variations in the intensity of the first heart sound. An apical-radial pulse deficit, reflecting variable stroke volumes and ventricular contraction patterns, is a hallmark of AF.

Diagnostic Tests: Key diagnostic tools include the electrocardiogram (ECG), which characterizes AF with its absence of discrete P waves, presence of fibrillatory waves, and irregularly irregular ventricular rhythms (10). The transthoracic echocardiogram (TTE) evaluates cardiac structure, function, valvular disease, and the presence of thrombi. Left atrial thrombi are better identified with transesophageal echocardiography. Exercise testing is particularly useful for patients with coronary artery disease to guide pharmacotherapy. Ambulatory monitoring captures intermittent arrhythmias and assesses AF burden, while laboratory testing covers blood count, electrolytes, renal function, and thyroid assessment. This comprehensive evaluation allows for a detailed understanding of the patient's AF and the factors contributing to their condition.

Initial Management

A systematic approach, exemplified by the Atrial Fibrillation Better Care (ABC) pathway, serves as a valuable tool for the initial management of AF patients, irrespective of whether they present with new-onset or longstanding conditions (11). The ABC framework prioritizes three fundamental aspects:

"A" for Anticoagulation: The evaluation of the necessity for antithrombotic therapy stands as a critical step, guided by the CHA₂DS₂-VASc score to mitigate the risk of systemic embolization (11).

"B" for Better Symptom Management: Achieving ventricular rate control, often through beta-blockers or calcium channel blockers, is pivotal in stabilizing hemodynamically unstable patients. Cardioversion may be considered for symptomatic individuals, preferably after 48 to 72 hours to allow for spontaneous reversion (11).

"C" for Cardiovascular Risk and Comorbidity Assessment: Identifying and addressing cardiovascular risk factors and associated conditions, such as hypertension, diabetes, and obesity, complements the overall management of AF (11,12).

Long-Term Management

Early Follow-Up: Following an acute AF episode, timely follow-up is of paramount importance. This allows for the assessment of the effectiveness of rate or rhythm control, the evaluation of patient adherence to therapies, a determination of the need for ongoing treatment, discussions on strategies to minimize AF recurrence, and an evaluation of the patient's functional status. A one-week follow-up, particularly for those on antiarrhythmic drug therapy, is often recommended (13).

Prevention of Thromboembolism: Decisions regarding long-term anticoagulation following a reversible incident are highly individualized and consider the future risk of AF recurrence. Shared decision-making on anticoagulation involving both patients and healthcare providers carefully weighs the benefits and risks of anticoagulation, discussing factors such as warfarin versus DOACs, as well as potential costs (13).

AF Recurrence: Recurrent episodes of AF are common but often unnoticed by patients. Lifestyle modifications can significantly impact AF recurrence. These include reducing alcohol intake and achieving weight loss through physical activity. Promising results have been observed in AF burden reduction with alcohol abstinence and healthy weight management (14).

Rate or Rhythm Control: After achieving ventricular rate control, the selection between rate and rhythm control strategies becomes a pivotal decision. Rhythm control methods, such as antiarrhythmic drug therapy or catheter ablation, aim to restore and maintain sinus rhythm, while a rate control approach employs medications to manage heart rate. Patient-specific factors guide the choice (15).

Long-Term Follow-Up: Regular follow-up, typically at intervals of every 12 months for stable patients, is imperative. This monitoring encompasses assessing the efficacy of antithrombotic and antiarrhythmic therapies, changes in functional status, and the adequacy of rate control. Stress testing aids in evaluating heart rate control during exercise. Laboratory tests, including blood count, electrolyte levels, renal function assessment, and thyroid evaluation, contribute to the comprehensive care of AF patients (15).

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