



A COMPREHENSIVE NARRATIVE REVIEW OF ATRIAL FIBRILLATION: CURRENT INSIGHTS AND FUTURE DIRECTIONS

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ABSTRACT

The exploration of risk factors in atrial fibrillation (AF) reveals hypertensive heart disease and coronary heart disease (CHD) as major contributors. Rheumatic heart disease maintains a link, especially in developing nations. Hypertensive heart disease's significance is emphasized by a 1.42-fold AF risk increase in those with hypertension history. CHD's connection emerges with acute myocardial infarction or heart failure. Valvular heart disease, mitral valve prolapse, rheumatic heart disease, and obstructive sleep apnea correlate with AF. AF classification includes paroxysmal, persistent, and long-standing persistent forms. Subclinical AF lacks symptoms. Valvular AF occurs in moderate-severe mitral stenosis. Evaluation involves history, physical exams, ECGs, and echocardiograms. The Atrial Fibrillation Better Care pathway guides initial management. Long-term care involves early follow-up, thromboembolism prevention, addressing AF recurrence, rate or rhythm control, and regular follow-up.

KEYWORDS : Atrial Fibrillation, Arrhythmias, Cardiac, Stroke, Anticoagulants, Risk Factors

INTRODUCTION

Atrial fibrillation (AF) poses a significant challenge in the realm of cardiac health, marked by irregular heart rhythms that disrupt the normal functioning of the heart. Delving into AF's epidemiology unveils a tapestry woven with diverse factors influencing its prevalence and incidence, requiring a comprehensive understanding. The global landscape of AF's prevalence paints a concerning picture, with evidence spanning continents indicating an increasing number of individuals affected by this condition. Age emerges as a prominent factor, with AF's prevalence rising notably as years advance. Yet, geography and genetics interweave, sculpting distinct prevalence patterns across populations. AF's emergence follows a choreography of time and risk. Longitudinal studies expose the intricate relationship between age and AF incidence, emphasizing heightened risks with increasing years (1).

Methods

In conducting a narrative review on atrial fibrillation (AF), a comprehensive approach was adopted to synthesize existing knowledge. The PubMed and Embase databases were systematically searched using Medical Subject Headings (MeSH) terms including "Atrial Fibrillation," "Epidemiology," "Risk Factors," and "Prevalence." A rigorous screening process was employed to identify relevant studies, encompassing those published from inception to the present date. Inclusion criteria comprised studies focusing on AF's epidemiology, its associations with demographic variables, and its prevalence patterns across diverse populations. Exclusion criteria involved non-English language studies and those lacking robust methodological design. The selected studies underwent meticulous data extraction, enabling the exploration of age-related trends, gender disparities, and geographical variations in AF prevalence.

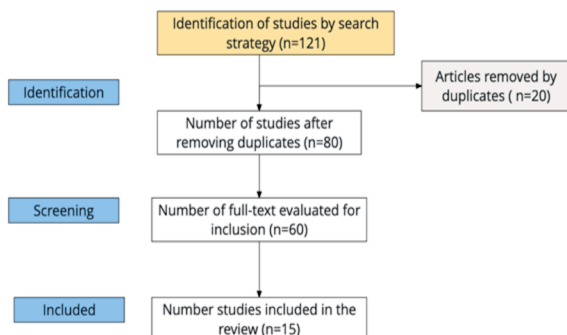


Figure 1. PRISMA.

Risk Factors

The exploration of risk factors in atrial fibrillation (AF) reveals a spectrum of chronic disease associations that underlie its onset. Notably, hypertensive heart disease and coronary heart disease (CHD) take center stage as prevailing contributors in developed nations. While rheumatic heart disease has waned in prevalence, it retains a robust association with AF, particularly in developing settings. Chronic AF, including its paroxysmal form, shares these associations (2).

Hypertensive heart disease's significance is amplified by a longitudinal study indicating a 1.42-fold increase in AF risk with hypertension history. This, coupled with its widespread occurrence in the general populace, positions it as a predominant underlying disorder in AF. In contrast, AF's connection with CHD usually emerges when complicated by acute myocardial infarction or heart failure. Acute myocardial infarction-triggered AF often arises transiently, while chronic stable CHD showcases a lower AF incidence (3).

Valvular heart disease, encompassing lesions causing substantial stenosis or regurgitation, consistently correlates with AF development. Notably, mitral valve prolapse and rheumatic heart disease demonstrate noteworthy AF prevalence, with age and left atrial dimension serving as prominent risk factors. Heart failure and AF often intertwine, each potentially predisposing to the other. Additionally, a correlation between obstructive sleep apnea and AF has emerged, with sleep apnea therapy showcasing promise in mitigating AF recurrence (4).

Classification and Terminology

Understanding the classification of atrial fibrillation (AF) offers insights into its dynamic nature and clinical presentation. The 2014 guidelines by the American Heart Association, American College of Cardiology, and Heart Rhythm Society established 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. Recurrences can manifest with varying frequency, shaping the patient's clinical course (6).

Persistent AF: In contrast, persistent AF persists beyond seven days and typically necessitates 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 (6).

Long-standing Persistent AF: This designation pertains to AF that endures for more than 12 months, underscoring its chronicity and complex management (6).

Permanent AF: when a joint decision by the patient and clinician is made to forego rhythm control strategies, the term "permanent AF" is employed. The patient's clinical condition, preferences, and therapeutic options influence this determination, which may evolve over time (6).

While AF typically transitions from paroxysmal to persistent states, the interplay between these forms remains a dynamic aspect of the disease course.

Subclinical or Occult AF: this discreet form of AF often lacks overt symptoms and emerges either in the context of thromboembolic events, acute heart failure exacerbations, other medical conditions, or routine electrocardiograms (ECGs) performed for unrelated purposes (6).

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

Evaluation

Evaluating atrial fibrillation (AF) involves a comprehensive assessment encompassing history, physical examination, and diagnostic tests. The patient's medical journey begins with a detailed history, documenting the onset, potential triggers, frequency, duration, severity, and qualitative characteristics of AF episodes. Information about previous supraventricular arrhythmias aids in understanding the patient's arrhythmic profile (8).

Associated conditions are pivotal components of the evaluation. Assessing cardiovascular disease, cerebrovascular disease, diabetes, hypertension, chronic obstructive pulmonary disease, and obstructive sleep apnea provides context for AF's underlying mechanisms and potential exacerbating factors. Furthermore, considering potentially reversible causes, like hyperthyroidism or unhealthy alcohol use, informs the overall assessment. The physical examination focuses on cardiovascular and associated conditions, aiming to detect murmurs, pulse abnormalities, and heart failure signs. AF's irregularly irregular pulse might yield variations in the intensity of the first heart sound. Notably, an apical-radial pulse deficit is a hallmark of AF, reflecting variable stroke volumes and ventricular contraction patterns (9).

Electrocardiogram (ECG) remains a cornerstone diagnostic tool. AF's absence of discrete P waves and presence of fibrillatory waves, accompanied by irregularly irregular ventricular rhythms, characterizes the ECG. Transthoracic echocardiogram (TTE) evaluates cardiac structure, function, valvular disease, and thrombus presence. Left atrial thrombi are better identified with transesophageal echocardiography. Exercise testing guides pharmacotherapy, particularly for coronary artery disease patients. Ambulatory monitoring helps capture intermittent arrhythmias and assesses AF burden, while laboratory testing covers blood count, electrolytes, renal function, and thyroid assessment (10).

Initial Management

A systematic approach, such as the Atrial Fibrillation Better Care (ABC) pathway, aids in the initial management of AF patients, both new-onset and longstanding (11). The ABC framework emphasizes three core aspects:

"A" for Anticoagulation: Evaluating the need for antithrombotic therapy is paramount, guided by the CHA₂DS₂-VASc score to prevent systemic embolization (11).

"B" for Better Symptom Management: Ventricular rate control using beta blockers or calcium channel blockers stabilizes hemodynamically unstable patients. Cardioversion might be considered for symptomatic patients, preferably after 48 to 72 hours for spontaneous reversion (11).

"C" for Cardiovascular Risk and Comorbidity Assessment: Identifying and addressing cardiovascular risk factors and associated conditions, like hypertension, diabetes, and obesity, complements AF management (11).

Observational studies and trials suggest that implementing such a framework yields favorable outcomes, reducing adverse cardiovascular events and hospitalizations while being cost-effective. Considering the management setting, outpatient care is often suitable for newly diagnosed AF. However, unstable patients exhibiting signs like hypotension, myocardial ischemia, heart failure, or severe symptoms require emergency intervention. Indications for hospitalization include ablation of an accessory pathway, severe bradycardia, and treatment of associated medical problems. Referral to a cardiologist may be necessary for complex cases or ablation considerations (12).

Long-Term Management

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

Prevention of Thromboembolism: Decisions regarding long-term anticoagulation following a reversible incident are individualized, considering the future risk of AF recurrence. Anticoagulation shared decision-making involving patients and providers weighs the benefits and risks of anticoagulation and discusses factors like warfarin versus DOAC, as well as potential costs (13).

AF Recurrence: Recurrent episodes of AF are common but often go unnoticed by patients. Lifestyle changes can impact AF recurrence, including alcohol reduction and weight loss coupled with physical activity. Alcohol abstinence and healthy weight management have shown promise in reducing AF burden (14).

Rate or Rhythm Control: Once ventricular rate is controlled, selecting between rate and rhythm control strategies is crucial. Rhythm control methods, such as antiarrhythmic drug therapy or catheter ablation, aim to restore and maintain sinus rhythm. A rate control approach employs medications to manage heart rate. Patients' individual factors guide the choice (15).

Long-Term Follow-Up: Regular follow-up, generally every 12 months for stable patients, is essential. Monitoring encompasses assessing antithrombotic and antiarrhythmic therapy efficacy, functional status changes, and adequacy of rate control. Stress testing helps gauge heart rate control during exercise. Laboratory tests including blood count, electrolytes, renal function assessment, and thyroid evaluation contribute to comprehensive care (15).

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