Untreated atrial fibrillation in the United States of America: Understanding the barriers and treatment options

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Atrial fibrillation is the most commonly treated arrhythmia in the United States of America. Stroke is the most devastating consequence of atrial fibrillation. For decades, warfarin has been the most recommended treatment for patients with atrial fibrillation at risk for stroke and systemic emboli. However, many patients at risk are not treated with anticoagulants. Several reasons exist, including physician underestimation of patient stroke risk, physician overestimation of bleeding risk, and patients' reluctance to take chronic warfarin due to the difficulties of this medication in relation to its pharmacokinetics and interactions with food and other medications. Risk scores have helped to better define patient risks and benefits from chronic anticoagulation. Novel anticoagulants (NOACs) have improved the ability for patients to be compliant with anticoagulation.

Keywords: Atrial fibrillation, Anticoagulation

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Atrial fibrillation is the most commonly treated arrhythmia in the United States of America. Since atrial fibrillation occurs most often in older individuals, and since the average age of the population is increasing, the incidence and prevalence of atrial fibrillation continue to grow at an alarming pace. Atrial fibrillation has many hemodynamic consequences caused by the loss of the atrial contribution to cardiac output as well as the rapid ventricular rates that occur in patients

Disclosure: Author has nothing to disclose with regard to commercial support.

Received 17 March 2014; accepted 9 September 2014.
Available online 28 September 2014

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Peer review under responsibility of King Saud University.
URL: www.ksu.edu.sa
http://dx.doi.org/10.1016/j.jsha.2014.09.003

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with normal AV node function. Structural changes which occur in the fibrillating atria, such as enlargement of the chamber and fibrosis of the atrial tissue, are well described. Some patients with atrial fibrillation present without any symptoms whatsoever, but others complain of palpitations, breathlessness, fatigue, and decreased exercise tolerance. Some patients remain asymptomatic until rapid rates lead to a cardiomyopathy, and symptomatic pulmonary edema may be the first manifestation of atrial fibrillation. Treatment for symptomatic patients with atrial fibrillation includes AV nodal blockers to control rate and sodium and potassium channel blocking agents such as Class I and Class III antiarrhythmic drugs to attempt to maintain sinus rhythm. Catheter ablation to isolate the pulmonary veins from the body of the left atrium has been shown to be an effective strategy in patients with paroxysmal atrial fibrillation refractory to antiarrhythmic drugs. Other strategies often include ablation of other foci along with pulmonary vein isolation and are employed in patients with persistent atrial fibrillation, usually with less success.

Abbreviations

ACC	American College of Cardiology
AFASAK	Atrial Fibrillation, Aspirin, and Anticoagulation
AHA	American Heart Association
ARISTOTLE	Apixaban for Reduction In Stroke and Other ThromboembolLic Events in Atrial Fibrillation
AV	atrioventricular
BAATAF	Boston Area Anticoagulation Trial for Atrial Fibrillation
CAFA	Canadian Atrial Fibrillation Anticoagulation
EAFT	European Atrial Fibrillation Trial
HRS	Heart Rhythm Society
INR	International Normalized Ratio
NOACs	novel anticoagulants
RE-LY	Randomized Evaluation of Long-Term Anticoagulation Therapy
ROCKET-AF	Rivaroxaban Once-daily, oral, direct factor Xa inhibition Compared to vitamin K antagonism for prevention of stroke and Embolism Trial in Atrial Fibrillation
SPAF	Stroke Prevention in Atrial Fibrillation
SPINAF	Stroke Prevention in Nonrheumatic Atrial Fibrillation

Although atrial fibrillation can have many consequences for individuals, the most devastating consequence of atrial fibrillation is stroke. Having atrial fibrillation increases the incidence of stroke by several-fold [1]. The left atrial appendage appears to be the most common place in the left atrium for thrombus to form due to stasis of blood as a consequence of poor atrial contraction in the fibrillating atrium, but thrombus can form in any portion of the atria.

Unlike the antiarrhythmic agents that attempt to maintain sinus rhythm with mediocre success, anticoagulant agents have been shown to be very effective in preventing thromboembolic complications of atrial fibrillation. For several decades, warfarin has been the standard treatment in preventing thromboembolism in patients with atrial fibrillation. Multiple studies published in the 1980s have shown both morbidity and mortality benefits in patients treated with warfarin with a target International Normalized Ratio (INR) of 2–3 as compared to those treated with placebo. In fact, when examining the results of the six major studies which addressed this issue – Atrial Fibrillation, Aspirin, and Anticoagulation (AFASAK), Stroke Prevention in Atrial Fibrillation (SPAF), Boston Area Anticoagulation Trial for Atrial Fibrillation (BAATAF), Stroke Prevention in Nonrheumatic Atrial Fibrillation (SPINAF), Canadian Atrial Fibrillation Anticoagulation (CAFA), European Atrial Fibrillation Trial (EAFT) – only one crosses the line of identity. This occurred because the study was terminated prematurely after the review board felt it unethical to continue the study when the results of similar trials were so impressive with warfarin being convincingly superior to placebo in stroke prevention. A meta-analysis of the data has demonstrated a statistically significant 62% relative risk reduction for stroke and a 26% relative risk reduction in all cause mortality in patients with atrial fibrillation treated with warfarin as compared to placebo [1]. Aspirin has also been used for stroke prevention in patients with atrial fibrillation, but the results are far inferior when compared to warfarin [2].

However, unlike the use of aspirin for patients with coronary artery disease, the use of warfarin in patients with atrial fibrillation remains unacceptably low. An analysis of the PINNACLE database (a volunteer registry of outpatient cardiology practices) demonstrated that only 55.1% of patients deemed eligible for warfarin without contraindications were treated with this agent [3]. Of the almost 45% of patients not on warfarin, slightly over half were treated with only an aspirin, about 5% were treated with a thienopyridine alone, and about 10% were treated with both an aspirin and a thienopyridine. Almost 35% of those not treated with warfarin were taking no antithrombotic or antiplatelet agent at all. Furthermore, there were wide ranges of compliance with