Lessons from the current European Heart Rhythm Association consensus document on screening for atrial fibrillation

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Abstract

In this paper, we reviewed the atrial fibrillation screening strategies in a stepwise manner and discussed the uncertainties in the assessment of the need for anticoagulation in light of the recently published European Heart Rhythm Association consensus document. We reviewed not only the methods and tools but also the role of health care professionals and patient organizations in addition to cost-effectiveness issues.
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Introduction

Atrial fibrillation (AF) is the most common type of arrhythmia and is a well-known risk for stroke. However, many patients with AF are asymptomatic, and unfortunately, silent AFs are also associated with an increased risk of thromboembolism. In many studies that evaluated the prognostic implications of clinically silent AF, the absence of symptoms was associated with worse outcomes in terms of stroke, transient ischemic attack, and mortality (1-3). Despite these findings that underlie the importance of detecting AF in asymptomatic patients, screening for AF is not yet recommended by scientific AF guidelines.

The European Heart Rhythm Association (EHRA) recently published a consensus document that highlights the importance of screening for AF with representation from the Heart Rhythm Society, Asia-Pacific Heart Rhythm Society, and Sociedad LatinoAmericana de Estimulacion Cardiaca y Electrofisiologia (4).

The consensus document firstly summarizes the potential advantages of detecting AF:

- Prevention of thromboembolic events by initiation of anticoagulation therapy
- Prevention of subsequent onset of symptoms
- Prevention and/or reversal of electrical/mechanical atrial remodeling
- Prevention and/or reversal of tachycardiomyopathy at the atrial and ventricular level
- Prevention and/or reversal of AF-related hemodynamic derangements
- Prevention of AF-related morbidity and reduction of AF-related hospitalizations
- Reduction of AF-related mortality

However, it is important to note that all potential advantages listed above are unproven and reported as hypothetical. First, the critical duration of AF episodes that increases the thromboembolic risk remains uncertain. It may be as brief as 5 minutes to several hours. Moreover, no studies have as yet reported the effect of screening for AF on stroke incidence; therefore, there remains a lack of evidence regarding the clinical benefits of early detection and treatment of screen-detected patients.

In addition to these uncertainties, the cost-effectiveness of screening for AF in the general population makes it unacceptable. Authors have proposed two different targets for effective screening. Subjects with a high risk of AF or patients with a history of stroke should be screened for subclinical AF. They have underlined the similarities of the risk factors for both strategies and the considerable overlap between these two theoretical approaches.

The screening yield depends on many factors. Therefore, a stepwise screening approach seems to be more appropriate when the entire document is evaluated .

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1. Defining the target population

Risk factors and risk scores

Since it is impossible to screen the entire population, an appropriate strategy suitable for the targeted population should be selected based on the risk of developing AF. Therefore, after the discussion of epidemiological factors, such as age, gender, ethnicity, and body size, authors recommend the use of risk scores to predict the risk of developing AF. They discuss the advantages and limitations of different risk scores. A model (CHARGE-AF consortium) incorporating age, race, height, weight, systolic and diastolic blood pressure, current smoking, use of antihypertensive drugs, diabetes, and history of myocardial infarction and heart failure was found to have significant discrimination (C statistic, 0.77; 95% CI, 0.75-0.78) in predicting AF over 5 years (5). Another risk score based on seven risk factors for AF (age, coronary artery disease, diabetes, sex, heart failure, hypertension, and valvular disease) showed a reasonable prediction of AF (C statistic, 0.81; 95% CI, 0.80-0.82) (6). The presence and intensity of these risk factors may require a more intensive screening.

The overlap between the risk factors for AF and ischemic stroke (CHADSVASc) has been highlighted, and another potential advantage of using these scores has been emphasized (7). Individuals who subsequently develop AF are likely to benefit from anticoagulation.

2. Deciding screening strategies

Both the EHRA consensus document and the European Society of Cardiology guidelines recommend opportunistic screening by taking the pulse or recording on an ECG strip in individuals aged 65 years or older (4, 8). Systematic ECG screening (methodical screening of all subjects) can be considered in individuals aged 75 years or older. Authors also recommend the expansion of systematic screening to younger individuals who have a high risk for stroke.

Secondary screening (after stroke or systemic embolism) is crucial and probably more effective. Therefore, prolonged rhythm monitoring, including external or implanted loop recorders, are recommended, if needed.

3. Selection of screening tools

After deciding the suitable strategy for the targeted population, the next step is the selection of the tools.

Clinical screening by taking the pulse or measuring the blood pressure is the simplest method. Automated blood pressure devices have been found to be more accurate and cost-saving compared with pulse palpation (9). Any clinical suspicion of AF or irregular heart rate evidenced using these devices should be confirmed by an ECG.

ECG screening: Traditional 12-lead ECG recording is far from to detect paroxysmal AF in asymptomatic patients. Sensitivity of the screening is obviously increased by its duration. Patient compliance, recording quality, and rhythm discrimination are the key elements. Patient compliance to dry-electrode, multilead, non-adhesive belts is better than that to traditional Holter monitoring with conventional adhesive skin-contact electrodes. Waterproof, continuous cardiac rhythm monitoring patches are also easily tolerated. Both technologies prolong monitoring and increase the sensitivity with regard to AF episode detection (10, 11).

New tools, such as single-lead ECG handheld devices, watch-like recorders, photoplethysmographic applications, and smartphone handheld ECGs and applications, have been comprehensively reviewed by the authors. The potential advantages of screening most of the population via smartphones, difficulties in the validation of recordings, and the risk of false positive results have been underlined in the report .

Patients with cardiovascular implantable electronic devices (CIEDs) have an advantage over the general population because clinically silent arrhythmias can be detected. The regular interrogation of pacemakers and implanted cardioverter-defibrillators memories should be considered for the early detection of subclinical AF. It has also been noted that remote and home monitoring of CIEDs provide earlier detection of arrhythmias than that with periodic office control (12).

4. Assessment of the need for anticoagulation

First, it is advised to confirm any clinical suspicion of AF by an ECG recording before assessing the patient for the need for anticoagulation. For device detected AF intracardiac electrograms, rather than mode switching counters or marker channel analysis of atrial high rate events (AHRE) episodes are recommended to confirm subclinical AF.

Complex temporal relationships between AF and stroke have been widely discussed in the text (13, 14). Authors have stated that the AHRE burden for >5-6 min in combination with stroke risk factors (e.g., CHA_2DS_2-VASc >2) is associated with an increased risk of stroke or systemic embolism. In contrast, authors have also underlined the uncertainty of the benefit of anticoagulation in patients with an AHRE duration shorter than 24 h. Probably because of these uncertainties, the exact time interval is not defined in the text and in the table of consensus statements.

Although the third figure of the document recommends considering patient characteristics and initiating anticoagulation for AHRE >5-6 min, this figure is adapted from the 2016 ESC Guidelines for the management of AF (8).

It is noteworthy that another elegant consensus document recently published by the EHRA that addresses the clinical management of device-detected subclinical atrial tachyarrhythmias recommends oral anticoagulation for AF burden >5.5 h/day (15). Similar uncertainties have also been discussed, and the possible need for anticoagulation for shorter durations with multiple risk factors has also been noted.

In addition, the consensus document cites that ongoing trials are trying to determine the minimal duration of AF needed to increase the risk of ischemic stroke and the total burden needed to warrant treatment with anticoagulation (16).

The role of health care professionals and patient organizations

Because they are the first to encounter a patient with suspected AF, the roles of general practitioners and other primary care health care professionals are highlighted. Different screening strategies and the role of health care professionals in this algorithm is defined in a step-by-step manner.

The importance of professional patient organizations and their role in healthcare systems in terms of raising awareness and delivering information and education have been reported. Examples from success stories of awareness campaigns have been shared, and all stakeholders are encouraged to organize campaigns to increase patient's consciousness about the risks of untreated AF.

Cost-effectiveness

At the end of the report, authors discuss the cost-effectiveness of screening. Naturally, there is no limit for screening. Sensitivity of the screening is increased by its duration and by the technology used. Unfortunately, its' cost as well. Authors have reported that the cost-effectiveness ratio is limited by the lack of reimbursement or financial incentives for screeners.

Authors have compared the efficacies of opportunistic and systematic screening strategies. Both strategies have been reported to have a similar efficacy in AF detection. However, opportunistic screening is associated with lower costs compared with systematic screening.

Conclusion

The consensus document presents a rational approach to an important health problem. It not only makes recommendations about screening methods and tools but also discusses the assessment of the need for anticoagulation. The role of health care professionals and patient organizations has been comprehensively reviewed, and the cost-effectiveness of all these recommendations has also been discussed.

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