

# Obey the first recommendation: start screening programmes for atrial fibrillation

Robert G. Tieleman<sup>1,2\*</sup> and Martin E. Hemels<sup>3,4</sup>

<sup>1</sup>Department of Cardiology, Martini Hospital Groningen, Groningen, The Netherlands; <sup>2</sup>Department of Cardiology, University Medical Center Groningen, Groningen, The Netherlands; <sup>3</sup>Department of Cardiology, Rijnstate Hospital Arnhem, Arnhem, The Netherlands; and <sup>4</sup>Department of Cardiology, Radboud University Medical Center Nijmegen, Nijmegen, The Netherlands

**This editorial refers to ‘A population screening programme for atrial fibrillation: a report from the Belgian Heart Rhythm Week screening programme’ by M. Proietti et al., on pages 1779–1786.**

The first recommendation of the current ESC guideline on atrial fibrillation (AF) is to perform opportunistic screening for AF in patients  $\geq 65$  years of age using pulse-taking followed by an ECG, to allow timely detection of AF.<sup>1</sup> The rationale for this recommendation is that patients with undetected asymptomatic ‘silent’ AF are not treated for the arrhythmia, which increases the risk of heart failure due to uncontrolled high ventricular rates and risk of ischaemic stroke.

Whereas AF-induced heart failure due to tachycardiomyopathy is usually reversible once appropriate ventricular rates have been achieved, the consequences of stroke are not. Furthermore, stroke in the presence of AF is two times more fatal and three times more disabling than stroke in patients without AF.<sup>1</sup>

Unfortunately, stroke in the setting of AF is not a rare phenomenon. Recently, Cotté et al.<sup>2</sup> described that in 2012 in France a total of 7% of patients with AF were admitted because of stroke/TIA or systemic embolism, with total annual costs for acute care and rehabilitation of 362 million euros. A few years earlier, in The Netherlands, it was demonstrated that in 45% of patients who were admitted with a stroke in the presence of AF, the arrhythmia was not known before the stroke.<sup>3</sup> Furthermore, among patients with a previous diagnosis of AF, only half received adequate anticoagulation according to the guidelines.<sup>3</sup> The above implies that early diagnosis of AF by a screening programme and anticoagulation therapy according to the guidelines not only can prevent many lives damaged, but also may significantly reduce the costs of care.

## Identification of silent atrial fibrillation

The article by Proietti et al.,<sup>4</sup> published in this issue of *EP-Europace*, describes how the Belgian Heart Rhythm Association (BeHRA)

organized a screening programme for AF during their annual heart rhythm weeks.<sup>4</sup> In total 65 747 persons were screened in 85 participating hospitals over a period of 5 years using a single-lead hand-held ECG device. In total, 911 patients with AF were identified. From the initial group, 52 741 patients reported not to have a previous diagnosis of AF. In this subset, 603 patients were newly diagnosed with AF by the screening programme (1.1%).

The prevalence of screening-detected silent AF in Belgium is in line with the results from a British study in general practitioner’s (GP) offices in which 1.6% of patients were detected by systematic ECG screening or opportunistic screening using pulse palpation and a 12-lead ECG in case the pulse was irregular, which is the basis for the above-mentioned recommendation in our guidelines.<sup>5</sup> However, opportunistic screening has not become common practice in the general GP office. One reason may be that pulse palpation can be difficult, and performing a 12-lead ECG is time-consuming. Furthermore, many GPs are not trained to interpret ECGs, which may diminish their readiness to perform screening. When patients with an irregular pulse are referred to a central laboratory for ECG analysis, the arrhythmia may have converted to sinus rhythm by the time the ECG is performed, and the irregular pulse may wrongly be considered as a false-positive result by the GP, further reducing the enthusiasm to continue screening thereafter. Theoretically, the same holds true for automatic blood pressure devices with irregular pulse detection capabilities<sup>6</sup> and smartphone applications which use the light and camera to detect irregularities in blood flow to detect AF.<sup>7</sup>

In the study by Proietti et al.,<sup>4</sup> screening of the general population was performed by nurses using a hand-held lead I ECG device (Omron). A cardiologist on site reviewed 30-s rhythm strips in case of suspicion of AF or uncertainty regarding the diagnosis, and a 12-lead ECG was performed as soon as possible after the initial recording. A similar approach was used in the SEARCH-AF trial, where AF screening was performed in local pharmacies in the UK using an iPhone-based ECG application screening 1000 customers aged  $\geq 65$  years.<sup>8</sup> The prevalence of AF in this study was 6.5% with 1.5% newly detected AF, and all identified patients had a CHA<sub>2</sub>-DS<sub>2</sub>-VASc score of  $\geq 2$ .

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\* Corresponding author. Tel: +31629732913; fax: +31505245802. E-mail address: r.tieleman@mzh.nl

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Another ECG-based programme in Sweden, the STROKESTOP study, demonstrated the usefulness of *repetitive* recordings.<sup>9</sup> In this study, all inhabitants of two regions at the age of 75 were invited to participate in an AF screening programme where they first received a 12-lead ECG, and in the case of the absence of AF they received a hand-held lead I ECG recording device (Zenecor) to take home with them for 2 weeks. The volunteers were asked to perform an ECG recording twice a day. Atrial fibrillation was diagnosed in a core lab, analysing all recorded ECGs. When using only the first index ECG recording, silent AF was present in 0.5% of patients. Using the recordings during the subsequent days, the prevalence of silent AF increased to 3%. Apart from the multiple recordings, the higher percentage of silent AF in the Swedish study was probably also due to the older age of the patients studied. We recently demonstrated a clear positive correlation between the prevalence of silent AF and the age of the population, using a hand-held ECG device with automatic AF diagnosis (MyDiagnostick) in 3269 patients undergoing influenza vaccination in The Netherlands.<sup>10</sup> No patients aged <60 years were identified. Between 60 and 75 years of age, ~1% of patients had silent AF, and between 75 and 85 years had ~2% of patients were newly diagnosed with the arrhythmia. Above 85 years of age, almost 5% of patients had silent AF. In this study, 97% of patients required oral anticoagulation according to the current guidelines.<sup>10</sup>

## Increasing atrial fibrillation awareness and current guidelines on anticoagulation

Proietti *et al.*<sup>4</sup> demonstrated high thrombo-embolic risk (CHA<sub>2</sub>DS<sub>2</sub>-VASc ≥2) being present in 85% of the patients with a previous AF diagnosis, and in 58% of patients with screening-detected AF.<sup>4</sup> Remarkably, adequate treatment with oral anticoagulation was prescribed only in 30% of patients with known AF and 2.8% of patients with new screening-detected AF. In the Swedish STROKESTOP study, these numbers were a lot better and more in line with recent registries, but still only 77.6% of patients with a previous diagnosis of AF received adequate oral anticoagulation, leaving 2.1% of the total initial population untreated despite a previous diagnosis of AF. Hence, together with the 3% silent AF cases, the prevalence of untreated AF detected by this intensive screening programme in Sweden was 5.1%. This illustrates that a screening programme in the general population not only can prevent strokes by early detection and treatment of undiagnosed silent AF, but also by identification and correction of therapy in known AF patients who are not treated with oral anticoagulation according to the current guidelines.

## Total impact of atrial fibrillation screening and awareness programmes

The above-mentioned studies using a single ECG measurement in the general population report an incidence of silent AF in patients aged ≥65 years ranging from 1.1 to 1.6%. In Europe, at present,

there are ~94 million persons aged ≥65 years. Therefore, one could estimate that full institution of a screening programme in all patients aged ≥65 years has the maximum potential to identify 1–1.5 million persons with silent AF who generally are not treated with oral anticoagulation. At a stroke rate of 5% per year these patients will suffer from 50 000 to 75 000 strokes, of which ~70% could be prevented by adequate anticoagulation. In case the patients with known AF, but without adequate anticoagulation, are also identified and treated the yield in stroke reduction can be even much higher.

Therefore, the current evidence suggests that screening is meaningful in all patients above the age of 65, since in most of these patients oral anticoagulation appears to be indicated. Furthermore, once AF is diagnosed, all physicians should adhere to the guidelines on initiation of oral anticoagulation in these patients. A screening programme, such as performed by the BeHRA,<sup>4</sup> is a good way to focus attention on this important topic to the general public, but it is still only a drop in the ocean of the total population at risk. For this purpose, the Dutch Society of Cardiology recently initiated the 'Connect AF' programme in The Netherlands. This initiative puts energy in teaming up GPs and all other AF caregivers, in order to develop and implement (regional) AF screening and spread the word on guideline-based anticoagulation. Ideally, routine and repetitive screening for AF is added to existing programmes in the elderly such as osteoporosis prevention, diabetes management, cancer screening, and cardiovascular risk management programmes. In this way we do not only increase the likelihood that the patients at risk are included in the screening programme, but also that appropriate anticoagulant treatment will be initiated in case of a diagnosis of AF. This will prevent many lives damaged and may significantly reduce the costs of care. Devices with ECG-based automatic AF detection, which are especially developed for AF screening, do not require highly trained professionals to perform screening, thereby further reducing costs of screening programmes.

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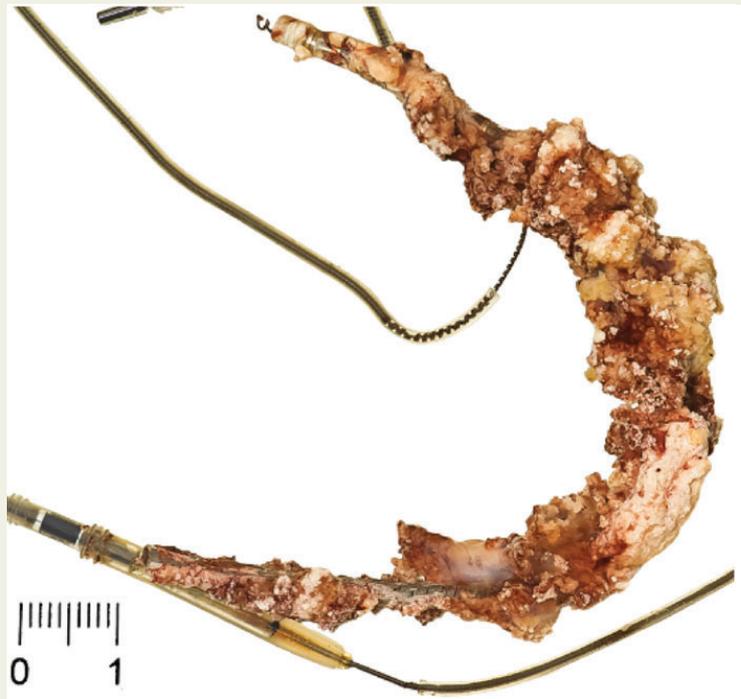
### The unusual case of floating bone in the heart

Felix Hohendanner<sup>1\*</sup>, Maximilian Krisper<sup>1</sup>, Simon Dushe<sup>2</sup>, Bruno Valentin Sinn<sup>3</sup>, Burkert Mathias Pieske<sup>1,4</sup>, and Florian Blaschke<sup>1</sup>

<sup>1</sup>Department of Cardiology, Charité Campus Virchow Klinikum, Charite Universitätsmedizin Berlin, Campus Virchow-Klinik, Augustenburger Platz 1, Berlin 13353, Germany; <sup>2</sup>Department of Cardiovascular Surgery, Charité Campus Mitte, Berlin, Germany; <sup>3</sup>Department of Pathology, Charité Campus Mitte, Berlin, Germany; and <sup>4</sup>German Heart Center Berlin, Berlin, Germany

\* Corresponding author. Tel: +49 30 450 659752; E-mail address: felix.hohendanner@charite.de

A 73-year-old woman first presented with heart failure, symptom class NYHA III, and fatigue that had gradually worsened over the course of 2 years despite medical outpatient therapy. She had a history of intermittent third-degree atrio-ventricular block that led to the implantation of a two-chamber pacemaker in 1997. At the time of presentation, transthoracic echocardiography revealed severe tricuspid valve stenosis. Further evaluation with transoesophageal echocardiography and cardiac computed tomography showed impingement of the right ventricular inflow tract caused by tricuspid valve calcification and calcification of the right atrial (RA; see *Figure*) pacemaker lead. In addition, the location of the RA lead was highly unusual as its tip was located at the dorsomedial part of the right atrium and its calcified 'body' in close vicinity to the tricuspid valve. After open-heart surgical removal of all leads and implantation of an epicardial pacemaker with atrial and ventricular leads, the patient regained normal functional status. Histological evaluation of the tissue surrounding the explanted right atrial lead showed sclerosis, calcification and metaplastic ossification. Metaplastic ossification is a rare complication of local inflammatory processes and might have been caused by subclinical endoplasititis involving the right atrial lead in this patient.



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