

EDITORIAL

Atrial Fibrillation Monitoring to Reduce Thromboembolic Risk:

Selecting the Patient and the Monitoring Device

Título em português: Monitorização electrocardiográfica para a redução do risco tromboembólico: Selecção do doente e do dispositivo de monitorização

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Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia and associates with a five-fold increased risk of stroke. At least 15-20% of strokes are attributed to underlying AF, but subclinical AF may be the cause of an additional number of cerebrovascular events. Data from cardiac implantable electronic devices (CIED) have shown that subclinical atrial tachyarrhythmias as short as >6 minutes associate with increased risk of thromboembolism (1). In fact, the often silent and intermittent nature of AF poses a problem. More than half of AF episodes are asymptomatic (2, 3) and therefore identifying patients at risk remains a challenge. This is well illustrative of the importance of AF monitoring. Continuous monitoring with implantable cardiac monitors is now widely used in patients with cryptogenic stroke to identify those with silent AF who warrant antithrombotic therapy (4), with AF prevalence of approximately 20% in this context. Stroke guidelines state that prolonged rhythm AF monitoring of approximately 30 days is reasonable within 6 months of a cerebrovascular event with no apparent cause (5). In addition to risk stratification for stroke prevention, AF monitoring and detection is also useful to assess the efficacy of rhythm control strategies, prevent inappropriate shocks in implantable cardioverter-defibrillator (ICD) patients and maximise the benefit of cardiac resynchronization therapy (CRT).

Detection of subclinical atrial tachyarrhythmias can be performed through a variety of tools, including external surface monitoring with intermittent 12-lead electrocardiogram, ambulatory Holter monitors, cardiac event recorders, portable electrocardiogram recorders (such as AliveCor), more recent adhesive patch electrocardiographic monitors, but also CIED such as implantable loop recorders, dual-chamber pacemakers or ICDs and CRT devices. Although longer-term Holter and event recorders have superior diagnostic yield compared to intermittent 12-lead ECGs (6), the need for a transmitter device and lower patient

compliance represent limitations. Patient compliance diminishes as the nominal monitoring duration increases, owing to concerns regarding skin irritation and the inconvenience associated with performing daily activities while wearing a monitor. More recent methods include simpler patch-type monitors which provide instant feedback and may lead to immediate changes in medical management. In patients with CIED, the possibility of continuous long-term monitoring increases the monitoring sensitivity. In the setting of post-cryptogenic stroke, long-term continuous monitoring with an implantable cardiac monitor has been shown to be superior in detecting AF than any intermittent monitoring strategy (7). However, their applicability is hampered by the need for an invasive procedure. Ideally, the optimal monitoring device should be non-invasive, inexpensive, simple to use and able to provide continuous long-term monitoring with immediate feedback.

In this issue of the *Journal*, Primo and colleagues have elegantly provided an assessment on the prevalence of AF, based on episodes of atrial arrhythmia lasting for more than 30 seconds, obtained through a 12-lead Holter monitor (8). Their study cohort included patients submitted to Holter monitoring due to a multitude of reasons, as determined by their referring General Practitioners. The main strengths of this study included **i)** its prospective nature, **ii)** the use of 12-lead electrocardiographic monitoring which allows for a more accurate determination of the underlying rhythm (with potential therapeutic implications) compared with the standard 3-lead Holter, **iii)** continuous 24-hour monitoring, as opposed to a single 12-lead ECG as used in the FAMA study (9), with improved diagnostic yield, **iv)** the inclusion of a relatively unbiased population of patients seen due to a multitude of cardiovascular symptoms, allowing for a more accurate representation of AF prevalence in this context, **v)** an independent and blinded analysis by up to three different

electrophysiologists, and **vi**) the large size of the study sample, allowing for a narrow 95% confidence interval.

Several important observations could be made from the results of this study. Firstly, more than 10 in every 100 patients participating in this study had documented AF or atrial flutter (of which one fifth with paroxysmal AF). This number is higher than what has been previously reported in both European and American studies (10, 11), although AF prevalence in individuals aged 80 years or older may indeed be well above 10% (10). In 2010, the number of adults aged ≥ 55 years with AF could reflect 1.8% of the total European Union population, and this number will rise to 3.5% by 2060. This increase will be particularly dramatic for adults over age 75 (12). The higher prevalence of AF in the present study is likely a result of the criteria used for patient selection. In fact, we should expect a higher AF prevalence in patients who present with cardiovascular symptoms, even if nonspecific, compared with a cohort of asymptomatic patients. However, this study does provide us with a reasonably accurate estimate of AF prevalence amongst symptomatic patients who are typically seen by their General Practitioners. The number may be higher in the context of a more specialised Cardiology outpatient clinic. It is also noteworthy that the greater ability to treat chronic cardiac and non-cardiac conditions, the aging population, and the improved ability to diagnose AF through a wider range of monitoring devices may explain the higher prevalence of AF with more recent studies compared with older ones.

Secondly, the vast majority of patients with documented paroxysmal AF had never had any ECG documentation of this arrhythmia and henceforth only a minority of these were anticoagulated. As the authors state, the very low use of anticoagulation is mainly a reflection of an undiagnosed cohort, although faulty judgments on the risk of bleeding,

especially in elderly patients, also helps explain the low rate of anticoagulation prescription in AF patients, as shown in the Portuguese setting (13).

In patients with cardiovascular symptoms, manual pulse palpation should be performed to determine the presence of an irregular pulse that could indicate underlying AF. A 12-lead electrocardiogram should then be performed on all patients in whom a diagnosis of AF is suspected based on the detection of an irregular pulse. The present study demonstrates that a 24 h Holter should also be considered for all of these patients, with consideration of longer monitoring in patients whose characteristics may put them at higher risk of AF: male sex, advanced age, those with history of arterial hypertension, chronic obstructive pulmonary disease, cerebrovascular or ischaemic heart disease. Likewise, a large waist circumference, sedentary lifestyle and high alcohol intake are also predictors of AF. Young age should not preclude appropriate investigation, as AF is seen throughout all age strata, as this study shows.

Notwithstanding the unequivocal merit of this study, we highlight that, in patients considered to be at high risk of AF, and especially those who have sustained a cerebrovascular event, 24-h Holter monitoring may be insufficient. It is well established that, the longer a patient is monitored, and this is not exclusive of implantable cardiac monitors, the greater the likelihood of detecting sustained atrial arrhythmias including asymptomatic AF, with subsequent impact on the rate of anticoagulation prescription (14, 15).

The role of AF monitoring for the selection of patients who could benefit from catheter ablation is much less straightforward. AF ablation is mostly indicated in symptomatic patients for quality-of-life purposes. AF ablation in asymptomatic patients is not currently recommended and this is unlikely to change in the near future unless studies

such as the *Catheter Ablation Versus Anti-arrhythmic Drug Therapy for Atrial Fibrillation* (CABANA) Trial demonstrate that performing a successful AF ablation can lead to decreased long-term risk of mortality or stroke compared with medical management. Despite promising results by Di Biase et al in a recent study of heart failure patients with AF (16), all other evidence supporting the utility of AF ablation in stroke or mortality risk reduction is based on observational data.

In summary, 24-hour 12-lead Holter monitors are an elegant screening method for patients with a multitude of cardiovascular symptoms, allowing the detection of paroxysmal AF or atrial flutter in a non-negligible percentage of patients. In patients with risk factors for AF and especially a recent history of thromboembolism, more prolonged or long-term continuous AF monitoring should be performed wherever possible. Even short-lasting atrial arrhythmias imply a significantly increased risk of thromboembolism and therefore any documented AF of at least a few minutes should lead to consideration of oral anticoagulation prophylaxis as per the CHA₂DS₂-VASc score.

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