

New research shows micro-AF episodes are early indicators of clinical AF

Study recommends extending cardiac monitoring for 72 hours if micro-AF is detected

Introduction

Supraventricular tachycardia (SVT) includes various types of reentrant fast heart rhythms originating in any part of the heart's conduction system above the ventricles. Although the types of SVT may differ in physiological mechanisms, the outcome of each is a rapid heartbeat that has a paroxysmal onset and termination.¹

Clinical guidelines define atrial fibrillation (AF) as an irregular SVT episode without p waves, with a duration longer than 30 seconds. However, ECG monitoring tests show that cardiac patients often experience similar episodes lasting less than 30 seconds (called micro-AF). This raises some very important questions:

What is the clinical significance of micro-AF?

Is micro-AF likely to progress to clinical AF?

Should my patient have more cardiac monitoring tests?

Should I begin treating my patient with oral anti-coagulants?

A number of recent studies indicate that there is a direct link between micro-AF and clinical AF, including a new study² presented at 2019 Heart Rhythm Society Annual Scientific Sessions which showed:

- 1) Micro-AF episodes (defined as abrupt onset episodes of ≥ 4 consecutive supraventricular beats, irregular rate-to-rate intervals, absence of regular p waves, lasting for < 30 second) are usually followed by clinical AF (≥ 30 s), and
- 2) Prolonged screening up to 72 hours after detection of an episode of micro-AF is recommended because such monitoring is likely to yield an episode of clinical AF.

These studies demonstrate the importance of continuous, full-disclosure online ECG monitoring to ensure that all micro-AF episodes are detected. A continuous data stream also allows clinicians to quickly and easily extend monitoring duration when such episodes occur to ensure accurate diagnoses.

Micro-AF associated with increased risk of clinical AF and stroke in a general population

Researchers are just beginning to uncover the clinical significance of shorter duration AF. A groundbreaking prospective study³ in Sweden in 2018 found that micro-AF was associated with incident AF and ischemic stroke. The population-based study included 24-hour ECG screening of 377 AF-free individuals (mean age 64.5 years; 43% men) who were prospectively followed for >13 years. Of these individuals, 65 experienced AF events and 25 experienced ischemic events.

The results also showed that 19 individuals had micro-AF, and of these, 9 (47.4%) were later hospitalized and diagnosed with AF during follow up. The study cited two key clinical implications of its findings:

- 1) Indicated a potential need for intensified screening for AF in patients with SVTs <30 seconds, especially for those with irregularity and absence of p waves.
- 2) Suggested that SVTs represent early signs of progressive atrial myopathy even in the absence of other AF characteristics.

Although the atrial substrate underlying AF is likely developing for years prior to its onset, there is no current evaluation to identify pre-clinical atrial myopathy.⁴ The investigators noted that its study findings, **“imply that 24h ECG perhaps could be used to predict and ultimately prevent both AF and stroke.”**

Another study published in 2018 identified micro-AF as a seemingly important risk factor for the development of AF in an elderly population. It divided participants who were clinically free of AF into either a micro-AF or a control group. After more than two years of follow-up, 50% of participants (27 of 54) in the micro-AF group had developed AF compared with 10% (5 of 48) in the control group. Another notable finding was that detection of AF was significantly higher during the two weeks of follow-up using continuous ECG monitoring compared with twice daily intermittent 30-second ECG recordings.⁵

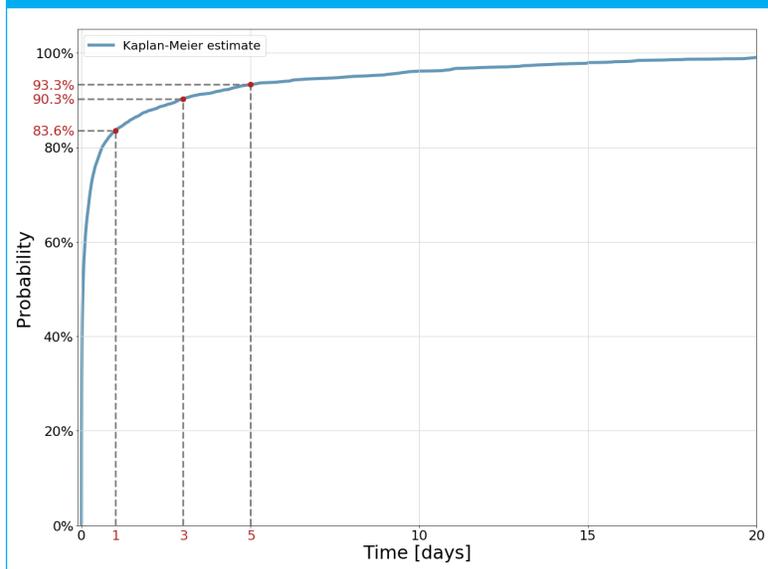
Cardiac monitoring after a micro-AF event is highly likely to detect clinical AF

The new study presented at the 2019 Heart Rhythm Society Annual Scientific Sessions not only strengthened the link between micro-AF and clinical AF but also found that the probability of an episode of clinical AF occurring within 72 hours after detecting micro-AF was very high (82%). Using one year of data, researchers evaluated cardiac telemetry reports from 26,567 people in the United States (42% men, median age 71 years) who recorded a long-term ECG (up to 30 days) with the PocketECG full disclosure mobile cardiac telemetry device.

Clinical AF or micro-AF was found in 17% of patients during monitoring duration; of these patients, 50% had only clinical AF, 9% had only micro-AF and 41% had episodes of both micro-AF and clinical AF. Not only was there a high probability that clinical AF would follow a micro-AF episode, but more importantly from a diagnostic standpoint:

These clinical AF events occurred within 72 hours of the micro-AF episode in more than 90% of the cases.

Probability of AF episode occurrence after micro-AF episode



In other words, if clinicians had known of these micro-AF events, they could have extended the monitoring duration to confirm clinical AF and potentially begun treatment. This study provides further evidence that micro-AF is likely to constitute an early step in the pathophysiological process of AF and emphasizes the importance of online monitoring.

Since there was such a high probability of detecting clinical AF with prolonged screening after an episode of micro-AF, the investigators concluded: “Additional monitoring for at least 72 hours is recommended after detection of micro-AF.”

Conclusions and implications

The new research highlights the importance of detecting micro-AF during cardiac monitoring, since such episodes are likely precursors of clinical AF and may even represent early signs of progressive atrial myopathy. Study findings raise two key questions for cardiologists:

What cardiac monitoring method is best-suited for micro-AF diagnosis?

When should I begin prescribing anti-coagulants for patients with micro-AF episodes?

The three studies cited directly or implicitly indicate that continuous, full-disclosure online monitoring may have distinct advantages over other monitoring methods in detecting micro-AF. A full-disclosure signal will capture all SVT and other very short arrhythmia episodes, including atrioventricular blocks and PACs. And continuous online streaming allows clinicians to easily extend monitoring duration for the recommended 72-hour period. Further, research⁶ presented at the 2018 Heart Rhythm Society Annual Scientific Sessions demonstrated that long-term continuous heart monitoring with PocketECG integrated arrhythmia diagnostic system provided significantly higher diagnostic yield (DY) than frequently used fixed duration offline methods—24- and 48-hour Holter monitors and multi-day patches.

The second question regarding anti-coagulants raises a broader issue about whether the current definition of paroxysmal AF and its arbitrary cut-off of >30s may prevent patients from receiving medications that could prevent future cardiac events. For patients whose cause of stroke is unknown (cryptogenic), clinicians usually prescribe anticoagulation therapy when monitoring shows paroxysmal AF duration of ≤30s. In fact, another meta-analysis review found that AF duration on 24h ECG is not related to stroke severity or early stroke outcome in cryptogenic stroke patients and concluded that the duration of paroxysmal AF should not influence anti-coagulation decisions.⁷

It's also worth noting that, even under the current clinical guidelines, anti-coagulants are under-prescribed. In a study of adherence to the oral anti-coagulation guidelines among hospitals participating in the American Heart Association's "Get with the Guidelines-AFIB" program, just 60% of eligible patients were treated with blood thinners at the time of hospital admission.⁸

About PocketECG

Turning heartbeats into powerful insights. PocketECG is an integrated arrhythmia diagnostic system provided by MediLynx Arrhythmia Diagnostics™, which combines Holter, event monitoring and advanced mobile cardiac telemetry in one device. PocketECG was designed in collaboration with healthcare professionals and patients worldwide to improve cardiac monitoring and reporting for greater accuracy of diagnosis. Unlike other systems, PocketECG streams the continuous, full-disclosure signal for up to 30 days and provides complete data, analysis and reporting—offering you the highest diagnostic yield for better patient diagnosis and treatment.

For more information, visit www.pocketecg.com.

About MediLynx

Medi-Lynx Cardiac Monitoring provides best-in-class cardiac monitoring solutions and service to improve patient diagnosis and treatment. The Company's lead technology, PocketECG, has been recognized by leading cardiologists and electrophysiologists for its comprehensive analytical capabilities that increase diagnostic yield over traditional ambulatory monitoring methods. The Company's team of highly-trained ECG technicians and care specialists serve as an extension of the cardiac clinical team, providing 24-hour monitoring, reporting, and support for cardiology practices and their patients.

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