Atrial Fibrillation Patterns on Ambulatory Electrocardiogram Monitoring and Risk of Stroke

Padrões de Fibrilhação Auricular na Monitorização Ambulatória do Eletrocardiograma e Risco de Acidente Vascular Cerebral

Keywords: Atrial Fibrillation; Electrocardiography, Ambulatory; Risk Assessment; Stroke
Palavras-chave: Acidente Vascular Cerebral; Avaliação de Risco; Eletrocardiografia Ambulatorial; Fibrilhação Auricular

Atrial fibrillation (AF) is a common rhythm disorder characterized by disorganized atrial activity and irregular ventricular contractions. On electrocardiogram (ECG), it presents as absent P waves, visible fibrillatory waves (f-waves), and irregular QRS complexes.

In ambulatory ECG monitoring, AF may either be present throughout the entire monitoring period or occur intermittently with sinus rhythm. The minimum duration required for an AF diagnosis on such devices is not clearly defined, although 30 seconds of AF-like activity is widely accepted.[1] Frederiksson *et al* defined episodes of AF-like activity with ≥ 5 consecutive supraventricular beats (SVB) with tachycardia lasting < 30 s as micro-AF.[2] Controversially, Berge *et al* proposed the lower threshold of ≥ 3 consecutive SVB.[3] However, the question arises: how should AF-like activity for < 3 consecutive SVB be classified? Is it correct to label such activity as SVB or should it be classified as distinct ultra-short episode AF? Yamada *et al* suggested calling ectopic SVB episodes < 5 s in duration short-run atrial tachyarrhythmia.[4] The diagnosis becomes challenging in patients with rapid ventricular response, where f-waves may be seen poorly. However, in patients with slow ventricular response, f-waves may be visible between or after QRS complexes, supporting a diagnosis of ultra-short AF.[5]

Based on the longest AF episode duration, the following patterns (Fig. 1) may be defined:

1. Ultra-short AF (< 3 consecutive SVB with obvious f-waves and absent P waves);
2. Micro-AF (≥ 3 consecutive SVB with AF-like activity lasting < 30 s);
3. Episodic AF (AF-like activity lasting > 30 s with at least one sinus rhythm episode);
4. Incessant AF (AF-like activity throughout the monitoring period with no sinus rhythm episode).

This classification should not be confused with paroxysmal, persistent, and permanent AF according to the 2024 European Society of Cardiology Guidelines for the management of atrial fibrillation.[1] These patterns reflect only the longest AF episode recorded on ambulatory ECG. Ultra-short, micro-, episodic, and incessant AF can occur in both paroxysmal and persistent AF. In permanent AF, only incessant AF is observed.

It is known that oral anticoagulants reduce stroke risk in AF.[1] A few studies have shown that micro-AF is associated with undiagnosed AF and an increased risk of major adverse cardiovascular events.[2,3] Even episodes of SVB lasting < 5 s are associated with increased stroke risk.[4] So, ultra-short AF should be distinguished as a distinct pattern, as it does not meet micro-AF criteria and there may be an underestimation of stroke risk if it is considered as just supraventricular beats.

AUTHOR CONTRIBUTIONS

OS: Study design, data acquisition and analysis, writing of the manuscript.

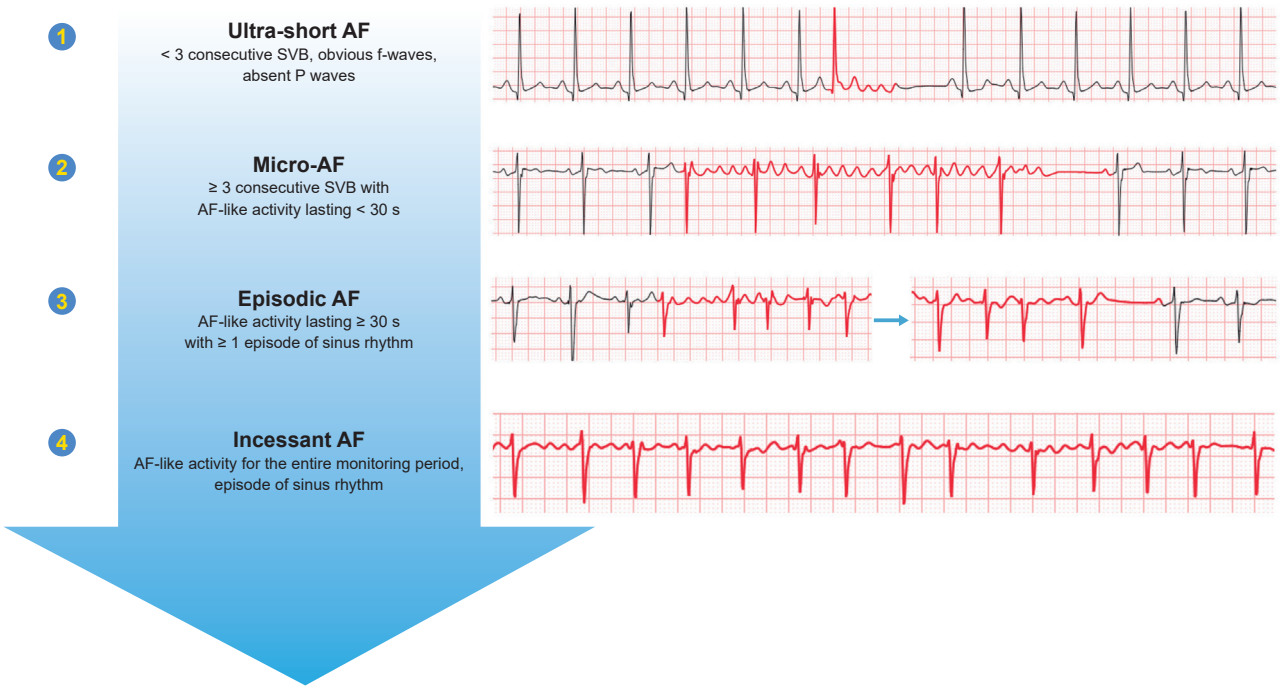

Figure 1 – Patterns of atrial fibrillation on ambulatory ECG monitoring

IV, YV: Study design, writing of the manuscript.
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COMPETING INTERESTS

The authors have declared that no competing interests exist.

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