Optimal treatment after stroke or transient ischemic attack (TIA) requires identification of atrial fibrillation (AF) if it is present. Standard antithrombotic therapy for patients not known to have AF consists of antiplatelet agents such as aspirin or clopidogrel. However, antiplatelet therapy is inferior to anticoagulant therapy for secondary stroke prevention in patients with AF. Therefore, failure to detect underlying AF as a cause of stroke or TIA results in inadequate antithrombotic therapy and an unnecessarily heightened risk of recurrent stroke.

Despite the high stakes, diagnosing AF in patients with stroke or TIA can be difficult. A routine 12-lead electrocardiogram will readily identify persistent AF, but AF often takes an asymptomatic and paroxysmal form that eludes detection. In a study of patients with pacemakers or implanted defibrillators, those with new device-detected AF after stroke or TIA manifested this arrhythmia a median of 5 minutes per day, and most had no AF at all on >90% of days. Unfortunately, intermittent AF seems to pose the same risk of stroke as sustained AF. Recent data indicate that a single period of AF lasting only 6 minutes independently confers a heightened risk of stroke. To ensure appropriate antithrombotic therapy for secondary stroke prevention, these elusive forms of AF must be reliably ruled out. In line with this goal, current guidelines recommend a 12-lead electrocardiogram and at least 24 hours of cardiac monitoring after stroke or TIA. However, these guidelines lack specific recommendations about the type and duration of monitoring, partly because of limited comparative data about different monitoring strategies.

In the current issue of *Stroke*, Rizos et al report a single-center observational study comparing 3 inpatient cardiac monitoring strategies for ruling out AF after stroke or TIA. The study prospectively enrolled patients with acute ischemic stroke or TIA and no documentation of AF by history or admission electrocardiogram. Throughout most of their hospitalization, patients underwent continuous cardiac telemetry monitored by a central station on the stroke unit (referred to in this study as continuous electrocardiographic monitoring [CEM]). The authors do not provide details about how CEM results were reviewed by stroke unit staff, but they were presumably guided by automated alarms set to certain rhythm parameters such as heart rate. Additionally, manual review of CEM was supplemented by automated analysis (aCEM) with software designed to detect AF. Lastly, patients also underwent inpatient Holter monitoring, which involves an ambulatory technology that records a continuous electrocardiographic tracing for later review by a cardiologist. For both CEM/aCEM and Holter, a diagnosis of AF required at least one episode lasting >30 seconds in accordance with current guidelines. Two investigators and an independent panel adjudicated all potential cases of AF detected by CEM/aCEM. Patients with <18 hours of Holter monitoring or <24 hours of CEM/aCEM data were excluded from the analysis.

Among 496 eligible patients, the median duration of stroke unit hospitalization was 89 hours, during which patients underwent CEM/aCEM for a median of 64 hours. Holter monitoring began a median of 15 hours after admission and lasted 24 hours. In 68 patients (13.7%), previously undiagnosed AF became apparent on at least one monitoring modality during hospitalization. Of these cases, 27 involved persistent AF that would have been detected with any type of monitoring. Of the 41 paroxysmal and therefore more elusive cases of AF, Holter identified 14 (34.1%), CEM 27 (65.9%), and aCEM 38 (92.7%).

Rizos et al should be commended for performing a rare comparative effectiveness study of strategies for diagnosing AF after stroke or TIA. What can we conclude from their results? First, although the authors conclude that aCEM is superior to Holter monitoring, their data suggest that inpatient Holter and aCEM perform similarly after adjusting for the duration of monitoring. This still supports the authors’ argument that appropriate inpatient aCEM infrastructure can obviate the need for formal inpatient Holter monitoring. However, depending on local institutional factors, 48- or 72-hour Holter monitoring may be a suitable alternative to aCEM. By providing real-time information, aCEM may result in faster diagnoses of AF, but the few days’ delay until Holter results are reported should not significantly affect the care of patients, many of whom would not immediately receive anticoagulation anyway because of the degree of acute brain infarction. Second, the superior yield of aCEM over CEM in this study reinforces the need for stroke units to ensure systematic and rigorous review of CEM data whether by trained personnel or software algorithms. This will prevent unfortunate situations in which AF is captured but not recognized. If adequate CEM review cannot be provided, it may be safer to rely on inpatient Holter monitoring, which involves formal review by a cardiologist. Third, the increasing yield provided by longer monitoring in this study should encourage clinicians to obtain as much inpatient monitoring as possible while being mindful of resource use (ie, avoiding unnecessarily prolonged hospitalization or inappropriate use of intermediate-care unit beds for stable patients simply for the purposes of cardiac monitoring).
What about patients with cryptogenic stroke or TIA who have no evidence of AF despite intensive cardiac monitoring during their hospitalization? Existing observational data suggest that prolonging the duration of monitoring even further may identify more patients with AF, although not all studies have been consistent with this hypothesis. Ongoing studies such as the CRYptogenic STroke And underLying Atrial Fibrillation (CRYSTAL-AF) and Event Monitor Belt for Recording Atrial Fibrillation After a Cerebral Ischemic Event (EMBRACE) trials will more clearly establish the usefulness of outpatient cardiac monitoring and help delineate optimal strategies for identifying patients with occult AF. For now, the limited evidence that is available supports performing outpatient cardiac monitoring in patients with cryptogenic stroke or TIA who are older or have underlying cardiac disease, enlarged left atria, clearly embolic-appearing cortical infarctions, or frequent premature atrial contractions during inpatient cardiac monitoring. This bears on the study by Rizos et al, because if outpatient cardiac monitoring is to be arranged anyway, could inpatient monitoring not be minimized or avoided? Probably, but it seems reasonable to attempt to rule out AF during hospitalization before incurring the costs and inconvenience of outpatient monitoring. To this end, Rizos et al have provided valuable data that will help stroke units tailor their inpatient cardiac monitoring protocols to make the best use of their institutional resources. More comparative studies such as this are needed to improve the diagnosis of AF as a cause of stroke or TIA and thereby optimize secondary stroke prevention.

Disclosures
None.

References

Key Words: acute care ■ atrial fibrillation ■ cardiac emboli ■ electrocardiography ■ embolic stroke ■ stroke units ■ transient ischemic attack
Tracking Down Atrial Fibrillation in the Stroke Unit
Hooman Kamel

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