The culprit of cryptogenic stroke: the short-term versus long-term atrial fibrillation detection rate in a tertiary care centre

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Background

Cryptogenic stroke (CS) and transient ischemic attack (TIA) patients have no determined aetiology at discharge. A possible cause for stroke is atrial fibrillation (AF). AF occurs in 20%-40% of the CS patients and diagnosis is highly dependent on monitoring duration. A long-term monitoring method is the insertable loop recorder (ILR), recommended by the European Society of Cardiology. However, this is not routinely used in Belgium despite reimbursement.

Purpose

This study aims to determine the AF detection rates of different methods used in clinical practice, ranging from short-term monitoring (monitoring in a stroke unit, 12-lead electrocardiogram (ECG), and 24-hour ECG), seven-day Holter, and long-term monitoring (smartphone application and ILR).

Methods

A monocentric, retrospective study was conducted in adults with CS or TIA between 1/01/17 - 1/01/20. Data were collected from the electronic medical record. The primary endpoint was the detection rate and time until first AF detection.

Results

A total of 368 patients suffered from a CS or TIA. Most of them were monitored in the stroke unit (96%) or with a 12-lead ECG (93%). A 24-hour ECG was used in 26%, a seven-day Holter in 38%. For long-term monitoring, a smartphone application was used in 3%. ILRs were inserted in 6%, with a median time of 102 days after stroke (IQR: 48-321). One year after ILR insertion, AF was detected in 23%.

AF detection increased with monitoring duration, as shown in the figure, except for 24-hour ECG, which detected no AF. Therefore, the AF detection rate was different between short-term monitoring (5%) and seven-day Holter (10%; p=.034), and short- and long-term monitoring (16%; p=.01).

The age of CS patients without AF (Mdn = 71yr) was lower than those with AF (Mdn = 79yr; p=.001). The National Institutes of Health Stroke Scale (NIHSS) and the CHA2DS2-VASc score of patients without AF (Mdn = 3) was lower than those with AF (Mdn = 6, p<.001; Mdn = 4, p=.004 respectively). The one-year mortality of patients with AF was 15% compared to 8% for patients without AF. No patients with an ILR deceased within one year after the stroke.

Conclusions

Detection of AF was associated with higher age, NIHSS, and CHA2DS2-VASc scores. These variables can be used to select patients for the insertion of ILRs. The detection rate of AF was significantly higher with long-term monitoring and seven-day Holter compared to short-term monitoring. However, only 38% of the patients were monitored for a week, and only 6% had an ILR inserted. Therefore, despite guideline recommendations, long-term cardiac monitoring is underutilised in this population of CS patients. Nevertheless, AF was still detected in 14% of CS patients within one year after the stroke. These findings emphasise the need for more monitoring with a seven-day Holter, smartphone app, and ILR in this patient population. Consequently, this will result in more accurate treatment of AF as secondary prevention of CS.

Abstract Figure. Time to first AF detection after stroke