

ABSTRACT PREVIEW: COMPARISON OF PHOTOPLETHYSMOGRAPHY-BASED SMARTPHONE ALGORITHM VERSUS INSERTABLE CARDIAC MONITOR IN CRYPTOGENIC STROKE

Comparison of Photoplethysmography-Based Smartphone Algorithm Versus Insertable Cardiac Monitor in Cryptogenic Stroke

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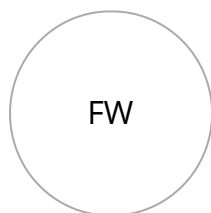
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Prior Presentation/Publication

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Abstract Details and Text

Topic

Cardiac: Other

Purpose

Insertable cardiac monitors (ICMs) are the gold standard for long-term atrial fibrillation (AF) detection in cryptogenic stroke patients but are invasive, expensive, and prone to false positives due to external interference or muscle artifacts requiring review by a health care professional (HCP).

This study aimed to test the performance of an automated photoplethysmography (PPG) algorithm Fibrichck© (Qompium NV, Belgium) using twice-daily smartphone spot-check measurements to detect AF episodes of > 6 hours compared to ICM monitoring.

Material and Methods

This prospective, multicenter trial compared the blinded use of PPG-based monitoring using a smartphone for 6 months to detect AF in cryptogenic stroke patients who underwent ICM insertion. Patients were asked to perform 60-second spot-checks using a smartphone twice daily. Additional measurements were possible when they experienced symptoms. A fully automated algorithm analyzed PPG measurements. Both patients and investigators were blinded to the PPG results.

Results

A total of 101 patients were included in this study. ICM generated 1127 alerts, of which 42 (3.7%) were confirmed AF episodes after review by an HCP in 8 patients (7.9%). Seven AF episodes lasting > 6 hours were detected in 3 patients. A total of 27322 PPG measurements were performed, and 2633 (9.6%) were of poor quality. 101 PPG measurements showed 'possible AF' in 14 patients, of which 6 patients had 2 consecutive 'possible AF' measurements. Among these, 2 patients had more than 4 consecutive 'possible AF' measurements. The overall accuracy of PPG vs ICM measurements was 99.7%, with a negative predictive value (NPV) of 100%. The positive predictive value (PPV) of PPG to detect AF episodes > 6 hours was 55.5% for at least 2 consecutive abnormal measurements and 100% for at least 4 consecutive abnormal measurements. Overall compliance with the twice-daily measurement protocol was 76%.

Conclusions

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Prolonged cardiac monitoring using a fully automated PPG algorithm on twice-daily smartphone spot-checks is feasible and highly accurate for detecting AF episodes > 6 hours compared to ICM. The PPG algorithm was tested stand-alone in this study without overreading, therefore saving significant time for the HCPs.

Smartphones also enable easy symptom recording for perfect symptom-rhythm correlation and support bidirectional communication for algorithm fine-tuning.

PPG-based Fibrichck© measurements are non-invasive, cheaper, available on every smartphone, and fully automated to detect AF.

Faculty Disclosure Task

DISCLOSURES

I have nothing to disclose in relation to this activity

Please list all organizations that apply to the listed interest type. If none apply, please write N/A.

Consultant:

N/A

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Speakers' Bureau:

N/A

Major Stock Shareholder:

N/A

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The mHealth app was provided by Qompium NV.

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