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Abstract Title: DETECTION OF ATRIAL FIBRILLATION USING PHOTOPLETHYSMOGRAPHY-BASED MONITORING IS NON-INFERIOR TO INSERTABLE CARDIAC MONITORS IN CRYPTOGENIC STROKE PATIENTS

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Background and Aims: The gold standard for long-term cardiac monitoring to detect atrial fibrillation (AF) in cryptogenic stroke patients is the insertable cardiac monitor (ICM). A non-invasive, less expensive alternative is photoplethysmography (PPG)-based monitoring using smartphones/smartwatches. This study aims to determine the non-inferiority of PPG-based rhythm monitoring with smartphones/smartwatches compared to ICMs for AF detection (>1h) in cryptogenic stroke patients.

Methods: This prospective, multicenter, double-blinded trial evaluated AF detection using PPG-based monitoring with smartphones/smartwatches compared to ICMs. Patients were randomized 1:1 to use smartphone (two one-minute spot-checks daily) or smartwatch (semi-continuous measurements every nine minutes) for six months.

Results: Among 185 patients, AF episodes lasting >1 hour were detected in 4.3% of patients by both ICMs and PPG-based monitoring. The digital follow-up strategy for detecting AF>1h, requiring at least 4 consecutive AF-positive measurements, resulted in only one false-positive and one false-negative case. As such, the detection of AF lasting longer than 1 hour using PPG-based monitoring on smartphone and smartwatches was non-inferior to ICMs ($p<.001$), with a significance level of $\alpha=.025$ and non-inferiority margin of $\delta=.07$.

Although the time to first AF detection was shorter using PPG-based monitoring on smartwatch compared to ICMs (watch: 49±38 vs. 75±76 days, $p=.261$; phone: 103±56 vs. 92±77 days, $p=.5$), the difference was not statistically significant, likely due to the limited number of patients in whom AF lasting longer than 1 hour was detected.

Conclusion: Prolonged cardiac monitoring using a PPG-based smartphone or smartwatch approach is non-inferior to ICMs for detecting AF>1h.

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