



MOBILE PHONE DETECTION OF ATRIAL FIBRILLATION: THE MODE-AF STUDY

Poster Contributions
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Background: Timely diagnosis of atrial fibrillation (AF) is crucial to prevent cardioembolic strokes. Efficient and cost-effective approaches to screen for asymptomatic AF are yet to be introduced. In mechanocardiography (MCG), mechanical cardiac activity is recorded with accelerometers and gyroscopes - components of almost all smartphones. In this case-control study, the capability of an innovative smartphone MCG application to discriminate AF from sinus rhythm (SR) was evaluated.

Methods: A 3 minute MCG recording was obtained from altogether 300 hospitalized subjects (150 in AF and 150 in SR) with a smartphone placed on their chest, while monitoring their rhythm with telemetry electrocardiography (ECG). Our previously developed algorithm classified the rhythm of the MCG recordings as either AF or SR. The accuracy of the MCG algorithm to differentiate AF from SR was evaluated in comparison to ECG interpretation by 2 independent cardiologists.

Results: The subjects' mean age was 74.8 years and 132 (44.0%) were female. The MCG algorithm correctly classified AF in 143/150 cases and SR in 144/150 cases resulting in a sensitivity of 95.3% and a specificity of 96.0%. The key performance figures of the algorithm are presented in Table. The kappa coefficient was 0.913 indicating near-perfect agreement between the MCG algorithm and visual interpretation of ECG recordings.

Conclusion: Smartphone MCG reliably detects AF without any additional hardware providing for reliable and accessible screening of AF.

Table. The Key Performance Figures of the MCG Algorithm in Detecting AF

	Value	95% confidence interval
Sensitivity	95.3%	90.6-98.1%
Specificity	96.0%	91.5-98.5%
Positive predictive value	96.0%	91.6-98.1%
Negative predictive value	95.4%	90.9-97.7%
Positive likelihood ratio	23.8	10.9-55.8
Negative likelihood ratio	0.05	0.02-0.10