Non-invasive mid-term ECG monitoring for the detection of atrial fibrillation in an outpatient population

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Background: Atrial fibrillation (AF) is a common arrhythmia with significant morbidity due to an increased risk of ischemic stroke. Outpatient electrocardiogram (ECG) monitoring is an integral part of the diagnosis of AF. Conventional 24 hour Holter monitoring can be cumbersome and often fails to diagnose patients with paroxysmal AF. Spyder ECG is a non-invasive ECG monitoring device that allows wireless transmission of ECG information for analysis. It is small and comfortable, allowing for easy application for the screening and detection of AF over a mid-term duration.
Purpose: This study aims to evaluate the incidence of AF in patients with no prior AF and CHADsVASC score of at least 1 with the use of the Spyder ECG mid-term ECG monitoring device.
Methods: Patients aged 21 to 85 years old with no prior history of AF and CHADsVASC score of at least 1 were recruited from outpatient clinics of 3 large tertiary hospitals in Singapore from December 2016 to April 2019. Patients wore the Spyder ECG device for up to 2 weeks, during which continuous ECG information was uploaded onto a central cloud database and analysed.
Results: There were 363 patients recruited. The mean age was 61±10.0 years and 65.1% were male. There were 80.3% Chinese, 11.6% Malay, 7.5% Indian and 20.6% of other races. 68.3% of the patients were non-smokers and 74.0% of them were non-alcohol drinkers. The mean BMI of 25.5±4.7 kg/m^2. The patient population had significant co-morbidities. 76.3% of the patients had hypertension, 69.4% of them had hyperlipidemia and 40.5% of them had diabetes mellitus. 10.0% of them had congestive cardiac failure and 56.7% had ischaemic heart disease. 11.3% of patients had a previous stroke and 20.4% had a prior myocardial infarction. 7.8% of the patients had asthma, 5.8% of them had thyroid disease and 9.9% of them had chronic kidney disease. They were monitored for a mean of 5.4±2.9 days each. There were 15 (4.1%) patients in whom AF was detected. The patients with AF wore the device for a mean of 5.7±2.0 SD days. The mean burden of AF was 9.0% of monitored time. 46.7% of the patients with AF had detection of AF on the first day, 26.7% on the second day, 13.3% on the third day and 13.3% on the seventh day. The mean duration of the first episode of AF was 251±325 minutes. 7 out of 15 (46.7%) of patients had first episodes of AF lasting less than 10 minutes.
Conclusion: Continuous mid-term ECG monitoring was able to detect AF in 15 (4.1%) of a population of 363 patients with no prior AF and CHADsVASC score of at least one, monitored for a mean of 5.4 days. Most episodes (53.3%) of AF were detected after the first day of ECG monitoring.