

Diagnostic accuracy of a home blood pressure monitor to detect atrial fibrillation.

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Abstract

Atrial fibrillation (AF) is the most common sustained arrhythmia and is associated with an increased long-term risk of stroke. A screening test for early diagnosis has the potential to prevent AF-related strokes. This study assessed the diagnostic accuracy of an automated device for self-home blood pressure (BP) monitoring, which implements an algorithm for AF detection. A modified, automated oscillometric device for self-home BP monitoring (Microlife BPA100 Plus, Microlife, Heerbrugg, Switzerland) with an AF detector was used to carry out triplicate BP measurements in subjects with sinus rhythm, AF and non-AF arrhythmias. During each BP measurement, the electrocardiogram (ECG) was recorded simultaneously. A total of 217 simultaneous BP measurements and ECG recordings were obtained from 73 subjects. Twenty-seven subjects (37%) had AF, 23 (31%) non-AF arrhythmias and 23 (31%) had sinus rhythm. A single measurement had 93% sensitivity and 89% specificity for detecting AF. For two measurements, in which one of them was required to detect AF, the sensitivity was 100% and specificity 76%, whereas for three measurements, in which two of them were required to detect AF, the sensitivity was 100% and specificity 89% ($\kappa=0.86$ for an agreement with ECG). Using the latter approach, there were five false positive cases all having irregularities in approximately 50% of the heartbeats. In patients with tachyarrhythmia, the device underestimated heart rate. These data suggest that an electronic device for self-home BP monitoring, which implements an algorithm for AF diagnosis has an excellent diagnostic accuracy and might, therefore, be used as a reliable screening test for the early diagnosis.

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