

Assessment of the Clinical Efficacy of the Heart Spectrum Blood Pressure Monitor for Diagnosis of Atrial Fibrillation

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Abstract

Atrial fibrillation (AF) is the most common arrhythmia. The most common diagnostic method, 12-lead ECG, can record episodes of arrhythmia from which the type and severity can be determined. The Heart Spectrum Blood Pressure Monitor (P2, OSTAR Meditech Corp.) is used to measure cardiovascular pressure change, with fast Fourier transform (FFT) analysis, to obtain the heart rate frequency variability and accurate blood pressure data. Here we compared the diagnostic efficacy of the Heart Spectrum Blood Pressure Monitor with a 12-lead ECG in patients with AF. Three measurement methods were used in this study: blood pressure, mean arterial pressure (MAP) which is calculated from individual blood pressure as constant pressure, and a constant pressure 60 mmHg, in order to analyze the heart index and compare it with simultaneous 12-lead ECG. The physician used a 12-lead ECG and the Heart Spectrum Blood Pressure Monitor simultaneously. The Heart Spectrum Blood Pressure Monitor used an FFT analysis for the diagnosis of AF; the findings were compared with the readings from the 12-lead ECG. This unblinded clinical trial was conducted at the Emergency Room of Taipei Medical University Hospital. Twenty-nine subjects with AF and 33 without AF, aged 25 to 97 years (mean: 63.5 years), were included. Subjects who had been exposed to high frequency surgical equipment during testing, those with cardiac pacemakers or implantable defibrillators, and pregnant women were excluded. The sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) are 96.67%, 96.88%, 96.67% and 96.88% for Method 1, 90%, 100%, 100% and 91.43% for Method 2, and 100%, 93.75%, 93.75% and 100% for Method 3, respectively. The sensitivity, specificity, PPV, and NPV for all these methods ranges between 90% and 100%, indicating that the Heart Spectrum Blood Pressure Monitor can be effectively applied to AF detection.

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