Detection of atrial fibrillation using a new smart wristband and AI algorithm

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Introduction: The detection of atrial fibrillation in a relative long period is key point in A-fib patient follow-up. Wearable devices may be an ideal solution. We examined a recently developed smart wristband (AMAZFIT Health Band 1S, model A1710) with its A-fib detector algorithm (developed with machine learning algorithm). The wristband could record both photoplethysmographic (PPG) signals and single channel ECGs.

Methods: We used 12-leads ECG as golden standard (Phillips DXL algorithm with human identify). 400 subjects were enrolled, including 250 ECG normal contrasts and 150 patients in ECG diagnosed A-fib status.

Result: Due to variable reasons, there are 15 cases “unidentified” in ECG results, and 18 cases “unidentified” in PPG results. The sensibility of ECG detector is 94.89%, specificity is 100%, and accuracy is 94.5%. The sensibility of PPG detector is 94.24%, specificity is 99.18%, and accuracy is 93.0%. When reading these single-channel ECG records by experienced ECG doctors, the sensibility is 96.67%, specificity is 98.4%, and accuracy is 97.75%.

Conclusion: This new combination of device and software seems promised in A-fib detecting, while need further evaluation in clinical situations.