Audio summaries from Dr. Valentin Fuster, JACC Editor-in-Chief.

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REFERENCE

1. Guo Y, Wang H, Zhang H, et al. Mobile photoplethysmographic technology to detect atrial fibrillation. J Am Coll Cardiol 2019;74:2365–75.

Atrial Fibrillation Episodes Detected Using Photoplethysmography

Do We Know Which Are True?

We read with great interest the recent publication on the Huawei Heart study by Guo et al. (1). The authors reported impressive work that significantly advances current knowledge on the feasibility of atrial fibrillation (AF) screening in daily life with already marketed wearable technologies measuring photoplethysmography (PPG). However, we are concerned about the limitations in the methodology that was used to determine the accuracy of detecting AF episodes.

Several authors have previously criticized the use of PPG technologies for AF screening because of the risk related to poor accuracy, which may have a negative impact on the patient and on the health care system. In the Huawei Heart study, the authors report the positive predictive value (PPV) of PPG signals to be 91.6%, which is very promising considering concerns about false positive detections. However, this result should be interpreted with caution.

The greatest problem is that Guo et al. (1) have derived detection accuracy of AF episodes based on an assumption that the suspected AF episodes were either all true or all false based on the final diagnosis at follow-up. This assumption may result in overestimation or underestimation of PPV, which, in turn, can lead to having the wrong impact on the acceptance of the technology. We previously reported in a smaller study that high PPVs up to 100% can be obtained in ambulatory settings (2,3), but in terms of study design, the fairest comparison should be made with the Apple Heart Study (4). There, preliminary results report a PPV of 71%, compared to which 91.6% is a significant improvement. Because every AF event counts, electrocardiographic reference should be available when adjudicating AF episodes as being true. This can make a difference in the fair evaluation

of the PPG technologies for improving care and management for AF patients.

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4. Apple Heart Study Demonstrates Ability of Wearable Technology to Detect Atrial Fibrillation. Stanford Medicine News Center. Available at: https://med.stanford.edu/news/all-news/2019/03/apple-heart-study-demonstrates-ability-of-wearable-technology.html. Accessed October 4, 2019.

The Efficacy and Feasibility of Atrial Fibrillation Screening Using Photoplethysmography-Based Smart Devices

I read with great interest the study by Guo et al. (1) that examined the efficacy of atrial fibrillation (AF) screening using smart devices with photoplethysmography technology. They noted the high positive predictive value of photoplethysmography signals. Patients with confirmed AF were then enrolled into an app-based integrated care program with the Mobile Atrial Fibrillation Application, and 80% of participants deemed to be at high risk were given oral anticoagulants.