The use of a photoplethysmography deriving smartphone app to screen for atrial fibrillation – experiences from Bosnia and Herzegovina

Elnur Tahirović*

International Burch University, Faculty of Engineering and Natural Sciences, Department of Genetics and Bioengineering, Sarajevo, Bosnia and Herzegovina

*ADDRESS FOR CORRESPONDENCE: Elnur Tahirović, International Burch University, Faculty of Engineering and Natural Sciences, Department of Genetics and Bioengineering, Francuske revolucije bb, Ilidža 71210, Bosnia and Herzegovina. / Phone: +387-61-800-269 / E-mail: elnur.tahirovic@gmail.com

ORCID: Elnur Tahirović, https://orcid.org/0000-0003-0878-3321

|||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

Introduction: Atrial fibrillation (AF) is the most common cardiac arrhythmia leading to a five-fold increased risk of stroke. Timely detection of AF is important for the initiation of appropriate therapy and the prevention of adverse outcomes such as AF-related stroke. The aim of this pilot study was to assess the use of a photoplethysmography (PPG)-deriving smartphone application (app) for early detection of AF and initiation of appropriate treatment to avoid AF-related complications such as stroke[1,2].

Patients and Methods: Participants were instructed to perform heart rhythm measurements twice daily and when experiencing symptoms for 7 days using a PPG-deriving smartphone application. All participants with possible AF based on the results of the PPG-deriving app were invited for a confirmatory 24h Holter electrocardiogram (ECG).

Results: A total of 201 patients participated in the study with a mean age of 54 years, ranging from 40 to 84 years. In total, 55% of the population was male, and the AF prevalence was 5.47% (male n= 6; age 61.7±5.3). All patients with possible AF based on the PPG measurements were confirmed on 24h Holter ECG. There were 3 patients without previously diagnosed AF. Nine patients (82%) were known with hypertension, five (45%) suffered from heart failure, and 7 (64%) were on anticoagulation therapy. One patient with AF had already a stroke. The thromboembolic risk evaluated with the CHA_2DS_2-VASc score was high in participants with AF (score ≥2). In this pilot study, the prevalence of AF was higher among participants with lower levels of education.

Conclusion: The use of smartphone-based technologies for the detection of AF has proven to be an effective way of screening the population for this heart rhythm, as all patients with a positive result based on the 7-day screening were confirmed via the 24-hour Holter ECG. Although this is a small pilot study, the results indicate that the number of patients with AF is higher in relation to available statistical data and date from everyday medical practice. PPG-deriving technologies enable remote AF detection and may contribute to timely initiation of appropriate treatments to avoid complications such as AF-related strokes. One of the major advantages of this approach is the fact that physicians can remotely screen and follow-up patients at risk without the need for face-to-face contacts.

LITERATURE |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

1. Krivoshei L, Weber S, Burkard T, Maseli A, Brasier N, Kühne M, et al. Smart detection of atrial fibrillation†. Europace. 2017 May 1;19(5):753-757. https://doi.org/10.1093/europace/euw125
2. Santos IS, Goulart AC, Olmos RD, Thomas GN, Lip GYH, Lotufo PA, et al; NIHR Global Health Group on Atrial Fibrillation Management. Atrial fibrillation in low- and middle-income countries: a narrative review. Eur Heart J Suppl. 2020 Dec 22;22(Suppl O):O61-O77. https://doi.org/10.1093/eurheartj/suaa181