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Validity of daily self-pulse palpation over two weeks for screening for atrial fibrillation among patients 65 years of age and older seeking primary care

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1 Works for me dx.doi.org/10.17504/protocols.io.m2ec8be

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ABSTRACT

Background

Pulse palpation is recommended for single time-point screening for atrial fibrillation (AF). The role of pulse palpation for AF detection has not been validated against simultaneous intermittent ECG recordings. We aimed to study the validity of AF screening using self-pulse palpation simultaneously with handheld ECG recordings three times daily for two weeks for AF.

Methods and Findings

Patients 65 years of age and older visiting four primary care centres were invited to take part in AF screening from July 2017 to December 2018. Handheld intermittent ECGs three times per day were offered to patients without AF for a period of 2 weeks and patients were instructed on how to take their own pulse simultaneously. A total of 1010 patients (mean age 73 years, 61% female) participated in the study and 27 (2.7%) new cases of AF were detected. A total of 53782 simultaneous ECG recordings and pulse measurements were registered. AF was verified in 311 ECG recordings, of which the pulse was palpated as irregular in 77 patients (25% sensitivity per measurement occasion). Of the 27 AF cases, 15 cases felt an irregular pulse on at least at one occasion (56% sensitivity per individual). 187 individuals without AF felt an irregular pulse on least one occasion. The specificity per measurement occasion and per individual was 98% and 81%, respectively.

Conclusion

AF screening using self-pulse palpation three times daily for two weeks has lower sensitivity compared with simultaneous intermittent ECG.

EXTERNAL LINK

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THIS PROTOCOL ACCOMPANIES THE FOLLOWING PUBLICATION

Ghazal F, Theobald H, Rosenqvist M, Al-Khalili F, Validity of daily self-pulse palpation for atrial fibrillation screening in patients 65 years and older: A cross-sectional study. PLoS Medicine 17(3). doi: 10.1371/journal.pmed.1003063

1 Design and Selection

1.1 Design: Cross sectional study.

1.2 Study population: It was planned to include patients who, for any reason, were seeking care in the primary health care and who were 65 years of age or older. Patients with previously known atrial fibrillation or ongoing anticoagualtion treatment were exluded.

Citation: Faris Ghazal (04/04/2020). Validity of daily self-pulse palpation over two weeks for screening for atrial fibrillation among patients 65 years of age and older seeking primary care. https://dx.doi.org/10.17504/protocols.io.m2ec8be

1.3 Inclusion criteria: All individuals in the target population who agreed to partticipate in the study.

1.4 Screening period: From June, 2017 to December, 2018.

1.5 Ethics approvals: This study was performed in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of Stockholm (DNR 2017/3:3).

2 Screening procedure

2.1 One to two nurses were assigned per center in this study. The nurses had received prior training in atrial fibrillation and pulse palpation.

2.2 Patients without previously known atrial fibrillation who visited the primary care center (PCC) for health consultation during the screening period were invited to participate in the screening programme.

2.3 Participants received written and oral information about the study. All participants gave their informed consent to participate by signing and submitting forms before entering the study.

2.4 In a 30-minute consultation with a nurse, participants completed a health questionaire about the presence of comorbidity according to the CHADS-VASC score. Body weight, height, pulse and blood pressure were measured. The nurse carefully instructed participants in the technique of radial pulse palpation to be performed at home three times daily over two-week period simultaneously with intermittent ECG recordings using a Zenicor handheld ECG.

2.5 When handheld ECG findings showed atrial fibrillation or any other suspected pathological finding, the ECG was re-examined by an experienced cardiologist in order to confirm the diagnosis. Individuals with unclear or uninterpretable ECG were further investigated with external loop recorder.

2.6 Oral anticoagulant was offered to those patients with newly detected atrial fibrillation.

3 Definition of the variables

3.1 Atrial fibrillation was defined, according to ESC guidelines as 30-second recording with absolutely irregular rhythm without distinct p-waves.

3.2 The CHADS-VASC score was used to assess risk for systemic thromboembolism.

4 Statistical analyses

4.1 Descriptive statistics: Categorial data were summarized by counts and percentages. For all continuous variables, visual inspection of histograms and the Shapiro-Wilk test were used to assess the deviation from a normal distribution. This test showed no normally distributed study data. Thus, medians with interquartile ranges were used.

4.2 Analyses: Fisher exact test was used to analyse categorical variables. Students t-test or Mann-Whitney test were used to compare continuous variables between two groups.

4.3 Odds ratio with 95% cinfidence intervals were used to test for associations between atrial fibrillation and risk factors. Multivariate logistic regression analyses were conducted to analyse the independant predictors for atrial fibrillation datection. For these tests, a probability value of two sided <0.05 was considered statistically significant. These analyses were performed using Stata statistical software version 10.

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4.4 Sample size was calculated to show a statistically higher detection rate of atrial fibrillation using a two-week intermittent ECG than detection rate using single time-point ECG on inclussion. We assumed a 1.4 % detection rate using single time-point ECG according to previous meta-analysis. We expected total detection rate of atrial fibrillation using a two-week intermittent ECG would be 3% depending on results of Strokstop study. Using an alpha value 0.05, power 0.75 to calculate sample size for the difference in the detection rates yielded 955. Thus, we chose a sample size of at least 1000

4.5 For pulse palpation for detecting atrial fibrillation, we constructed 2 x 2 contingency tables to enable calculation of sensitivity, specificity, positive predictive value and negative predictive value.

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