INPLASY

Diagnostic accuracy of single-lead ECG device in detecting atrial fibrillation in adults in the community: A systematic review and meta-analysis

Corresponding author:
Haitao Sun

sunht_2006@163.com

Author Affiliation:
Department of Electrocardiogram Room, Yantai Yuhuangding Hospital.

Shi, Z[1]; Yan, B[2]; Sun, HT[3].

ADMINISTRATIVE INFORMATION

Support - N/A.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2023100081

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 October 2023 and was last updated on 24 October 2023.

INTRODUCTION

Review question / Objective The study outcomes were described with forest plots. Odds ratios (OR) were calculated using a random effects model. I2 was estimated to evaluate heterogeneity. We conducted subgroup analyses and meta-regression analysis further.

Condition being studied Atrial fibrillation (AF) is the most common progressive arrhythmia in the world. Early diagnosis of AF is critical. However, the diagnostic accuracy of AF remains challenging. The single-lead electrocardiogram (ECG) is widely used in AF detection. We sought to explore the diagnostic accuracy of single-lead ECG device in detecting AF in adults in the community.

METHODS

Search strategy (Atrial Fibrillation OR Auricular Fibrillation OR AF) AND (Electrocardiography OR single-lead ECG OR single-lead Electrocardiogram OR single-lead Electrocardiograph) AND (community OR community population) AND (screening OR monitoring OR detection ORprevalence).

Participant or population Patients with Atrial fibrillation.

Intervention N/A.

Comparator Subgroup analysis of heterogeneity sources in meta-analysis of AF detectionrate by single lead electrocardiogram recording system.

Study designs to be included Literature search for clinical trials was carried out in PubMed, Scopus, Embase, and Medline databases. The qualities of involved articles were assessed. The study outcomes were described with forest plots. Odds ratios (OR) were calculated using a random effects model. I2 was estimated to evaluate heterogeneity. We conducted subgroup analyses and meta-regression analysis further.

Eligibility criteria N/A.

Information sources PubMed, Scopus, Embase, and Medline.

Main outcome(s) The results of meta-analysis implied that the overall AF detection rate by single-lead ECG device in adults in the community was 1.7% (95% CI 1.4% to 2.1%, Figure 2). There was significant heterogeneity between the 9 studies (I2=94%).

Additional outcome(s) AF detection rate of single time and multiple intermittent.

Quality assessment / Risk of bias analysis The quality evaluation of involved studies was carried out using 16 items from the Downs and Black checklist. Calculated scores ranged from 0 to 15. The higher the score, the higher the quality of the literature. Among them, the quality of literature was low in 0-5, medium in 6-10, and high in 11-16.

Strategy of data synthesis Revman 5.3 and R Project 3.4.1 were utilized for the meta-analysis. Firstly, the double arcsin was used to convert the AF detection rate. Then, the random effect model was used for meta-analysis, and the detection rate of AF and its 95% confidence interval (CI) were obtained. Forest maps were employed to exhibit the results graphically and heterogeneity was assessed by the I2 statistic. The subgroup analysis was carried out through evaluating the detection rate of invloved articles. Univariate meta-regression analysis was conducted to evaluate the influence of different clinical and screening elements with AF detection. P <0.05 denoted statistical significance.The quality evaluation of involved studies was carried out using 16 items from the Downs and Black checklist. Calculated scores ranged from 0 to 15. The higher the score, the higher the quality of the literature. Among them, the quality of literature was low in 0-5, medium in 6-10, and high in 11-16.

Subgroup analysis The subgroup analysis was carried out through evaluating the detection rate of invloved articles. Univariate meta-regression analysis was conducted to evaluate the influence of different clinical and screening elements with AF detection. P <0.05 denoted statistical significance.

Sensitivity analysis Sensitivity analysis was carried out to assess the stability of the consequences. We observed no significant variations with eliminating any one article. Due to the number of included studies was less than ten, we therefore did not sketch funnel plot to examine whether the existence of publication bias.

Country(ies) involved China.

Contributions of each author
Author 1 - Zheng Shi - Methodology, Investigation, Data curation, original draft.
Email: 931507917@qq.com
Author 2 - Bo Yan - Writing, review & editing.
Email: 271800749@qq.com
Author 3 - Haitao Sun - Idea, Supervision, review &editing.
Email: sunht_2006@163.com