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Invited Review Article

Diagnostic accuracy of artificial-intelligence-based electrocardiogram algorithm to estimate heart failure with reduced ejection fraction: A systematic review and meta-analysis

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ABSTRACT

Introduction: AI-based ECG has shown good accuracy in diagnosing heart failure. However, due to the heterogeneity of studies regarding cutoff points, its precision for specifically detecting heart failure with left ventricle reduced ejection fraction (LVEF <40 %) is not yet well established. What is the sensitivity and specificity of artificial-based electrocardiogram to diagnose heart failure with low ejection fraction (cut-off of 40 %. Aims: We conducted a meta-analysis and systematic review to evaluate the accuracy of artificial intelligence electrocardiograms in estimating an ejection fraction below 40 %.

Methods: We searched PubMed, Embase, and Cochrane Library for studies evaluating the performance of AI ECGs in diagnosing heart failure with reduced ejection fraction. We computed true positives, true negatives, false positives, and false negatives events to estimate pooled sensitivity, specificity, and area under the curve, using R software version 4.3.1, under a random-effects model.

Results: We identified 9 studies, including patients with a paired artificial intelligence-enabled electrocardiogram with an echocardiography. patients had an ejection fraction below 40 % according to the echocardiogram. The AI-ECG data yielded areas under the receiver operator of, the

Abbreviations: AI, artificial intelligence; AUC, area under the curve; ECG, electrocardiogram; HF, heart failure; LVEF, left ventricular ejection fraction; LVSD, left ventricular systolic dysfunction.

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