



AC039

Adult Cardiology & Clinical Cardiovascular Medicine • Poster Presentation

AI-ENHANCED ELECTROCARDIOGRAM ACCURACY IN PREDICTING PERIPARTUM CARDIOMYOPATHY: A SYSTEMATIC REVIEW.

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Background Peripartum cardiomyopathy (PPCM) is a potentially life-threatening cause of heart failure during late pregnancy or the early postpartum period. Early diagnosis is challenging because symptoms often overlap with normal physiological changes of pregnancy, while access to echocardiography is limited in many low-resource settings. Artificial intelligence-enhanced electrocardiography (AI-ECG) has emerged as a promising non-invasive screening tool. This systematic review and meta-analysis evaluated its diagnostic accuracy for detecting PPCM. Methodology PubMed, MEDLINE, Scopus, Semantic Scholar, and Google Scholar were searched for studies published between January 2015 and June 2025 evaluating machine learning- or deep learning-enhanced ECG models for PPCM detection. Random-effects meta-analysis pooled sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and area under the receiver operating characteristic curve (AUC). Diagnostic performance was also explored across left ventricular ejection fraction (LVEF) thresholds.

Results Five studies met the inclusion criteria. At the primary LVEF $\geq 45\%$ threshold, pooled sensitivity was 0.94 (95% CI 0.22–1.00), specificity 0.95 (95% CI 0.86–0.98), PPV 0.51 (95% CI 0.34–0.68), NPV 0.99 (95% CI 0.89–1.00), and AUC 0.93 (95% CI 0.88–0.99). Across LVEF thresholds ($\geq 35\%$ – $\geq 50\%$), sensitivity remained high, while specificity, NPV, and AUC remained stable. PPV increased with higher LVEF thresholds. Substantial heterogeneity was observed across included studies.

Conclusions AI-enhanced ECG demonstrated high diagnostic accuracy for detecting PPCM, supporting further evaluation as an accessible, non-invasive screening tool, particularly where echocardiography is unavailable. Larger prospective multicentre studies are needed to validate its clinical utility across diverse populations.

Keywords: Peripartum cardiomyopathy, Artificial intelligence, Electrocardiography, Machine learning, Diagnostic accuracy, Systematic review, cardiovascular disease