

Echocardiographic estimate of pulmonary capillary wedge pressure improves outcome prediction in chronic heart failure

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¹Sant'Anna School of Advanced Studies, Pisa, Italy

²Toscana Gabriele Monasterio Foundation, Pisa, Italy

³University of Florence, Department of Physics and European Laboratory for Non-linear Spectroscopy, Florence, Italy

⁴University Hospital of Liege (CHU), GIGA Cardiovascular, Department of Cardiology, Liege, Belgium

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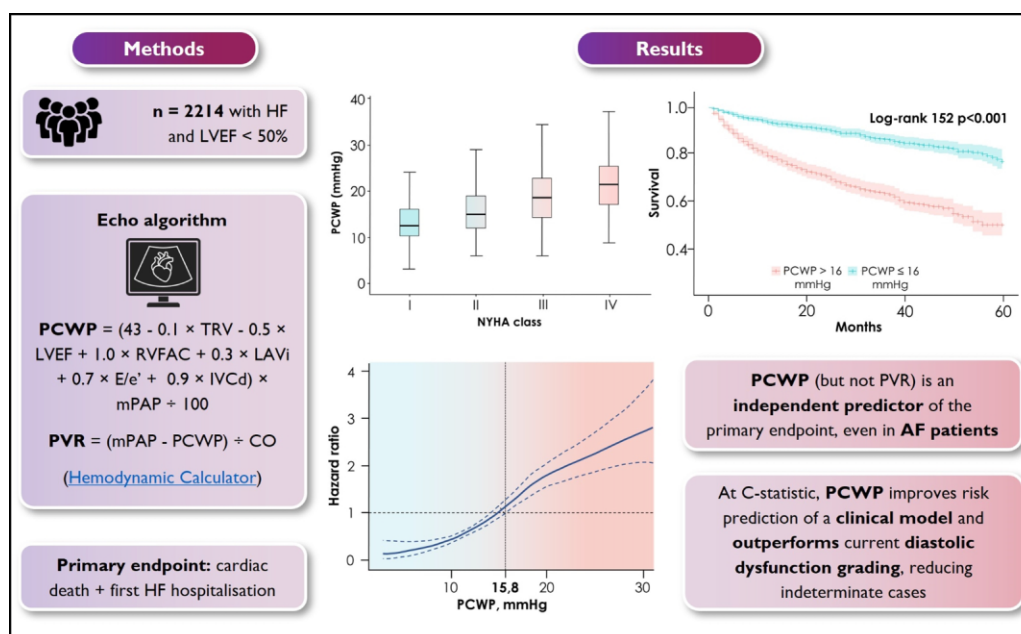
Background: An echocardiographic algorithm to estimate pulmonary capillary wedge pressure (ePCWP) and pulmonary vascular resistance (ePVR) has been recently validated versus right heart catheterization (1).

Purpose: The aim of this study was to assess the prognostic significance of these measures in heart failure (HF) patients.

Methods: Consecutive outpatients with HF and left ventricular ejection fraction (LVEF) <50% undergoing echocardiography were selected and followed-up for the composite endpoint of cardiac death or HF hospitalization.

Results: Out of 2,214 patients (71±12 years, 76% males, LVEF 35±9%), ePCWP (16±6 mmHg) was elevated (>15 mmHg) in 52% of cases and ePVR (1.7±0.7 WU) was elevated (>2 WU) in 25% of cases. Patients with increased ePCWP were older, had a higher NYHA class, more pronounced cardiac remodeling, systo/diastolic dysfunction, and neurohormonal activation, particularly when ePVR was also elevated (p<0.001). Over a median follow-up of 33 (17-48) months, both measures stratified patients for the risk of the primary endpoint (Log-Rank 152 for PCWP, and 44 for ePVR, p<0.001). At adjusted regression analysis, ePCWP (hazard ratio for 1 mmHg increase 1.03 [95%CI 1.01-1.05], p<0.001) but not ePVR (p=0.584) predicted the primary endpoint, even in the subpopulation of patients with atrial fibrillation (p=0.003). ePCWP outperformed current diastolic dysfunction grading (Δ C-statistics 0.068 [95% CI 0.045-0.093], p<0.001), and stratified patients' risk across each diastolic dysfunction grade at univariate analysis (Grade I: p=0.002; Grade II-III: p<0.001; Indeterminate cases: p=0.010). The addition of ePCWP to a multivariable prognostic model, including patients' age, NYHA class III-IV, chronic obstructive pulmonary disease, estimated glomerular filtration rate, NT-proBNP, and LVEF, improved the accuracy of risk prediction (Δ C-statistics 0.008 [95% CI 0.002-0.014], p=0.007). **Conclusion:** The echocardiographic estimates of PCWP retained clinical and prognostic significance in a large contemporary cohort of patients with chronic HF and LVEF <50%. This algorithm could facilitate early identification of high-risk patients, possibly reducing the need of right heart catheterisation, and allowing a tailored therapeutic approach.

Graphical abstract



KM curves for the primary endpoint - AF

