

Prognostic value of artificial intelligence-derived echocardiographic measurements in ATTR cardiomyopathy

A. Walser¹, A. J. Flammer¹, M. J. Hundertmark², I. Shiri², R. Schwotzer³, F. Ruschitzka¹, F. C. Tanner¹, C. Gräni², D. C. Benz¹
¹University Hospital Zurich, Department of Cardiology, Zurich, Switzerland, ²Bern University Hospital, Inselspital, Department of Cardiology, Bern, Switzerland, ³ University Hospital Zurich, Department of Medical Oncology and Hematology, Zurich, Switzerland

INTRODUCTION

- ATTR-CM is progressive and potentially fatal → accurate risk stratification needed
- Echocardiography is first-line; AI-based tools increasingly used, but the prognostic value of AI-derived measurements is unclear

PURPOSE

What is the prognostic value of AI-derived echo measurements, and do they add to biomarker-based (NAC) staging in ATTR-CM?

METHODS

- Retrospective cohort, 2 registries; ATTR-CM
- Baseline echo fully AI-quantified (Us2.ai): LVEF, GLS, TAPSE
- Kaplan–Meier, Cox regression, ROC for 1-year event prediction
- Cutoffs (moderate/severe) by log-rank maximization
- Echo staging = LV-GLS + TAPSE → low (both normal), intermediate (one abnormal), high (both abnormal)

CONCLUSION

AI-derived echocardiography provides robust prognostic stratification in ATTR-CM, comparable to manual measurements and incremental to NAC staging, supporting its clinical use for risk stratification.

RESULTS

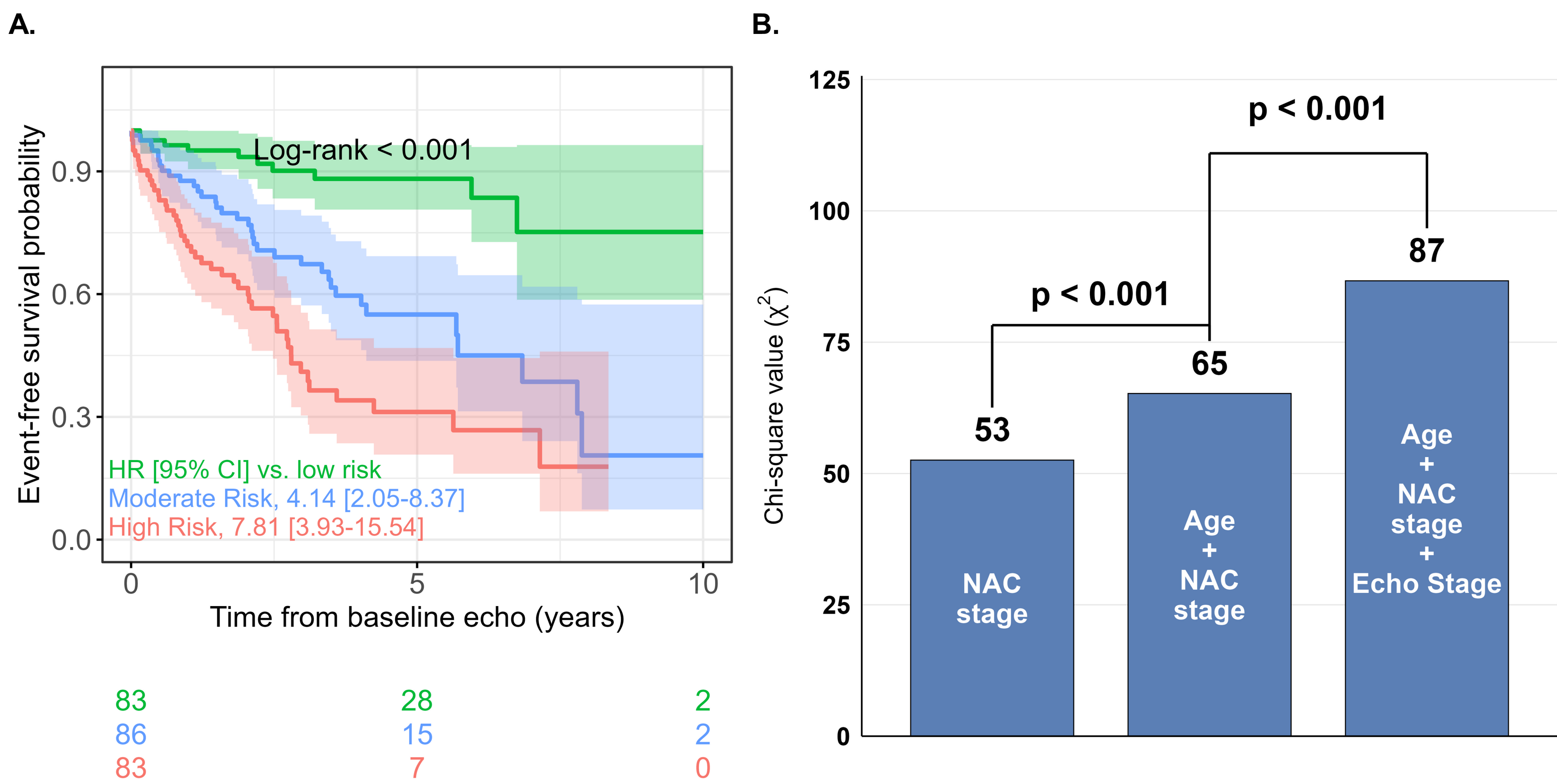


Figure. Association of echo staging LV-GLS + TAPSE with event-free survival. **A**, Cumulative event-free survival stratified by echo staging risk groups. **B**, Likelihood ratio test.

- 347 patients (91% male, median age 78 y); follow-up 2.4 y [IQR 1.1–4.1]
- Composite endpoint in 141 (41%): 60 deaths (17%), 81 HF hospitalisations (23%)
- Univariate predictors (all $p < 0.001$): GLS 1.16 [1.10–1.22] per 1%, TAPSE 0.88 [0.84–0.92] per 1 mm, LVEF 0.95 [0.94–0.97] per 1%
- Echo staging stratified risk: HR 4.14 (intermediate) and 7.81 (high) vs. low ($p < 0.001$)
- Incremental value over age + NAC staging: χ^2 87 vs. 65, C-index 0.790 vs. 0.759 ($p < 0.001$)
- AI vs. human measurements: no difference in 1-year prediction (TAPSE AUC 0.64 vs. 0.58; GLS 0.64 vs. 0.62; LVEF 0.66 vs. 0.69; all $p \geq 0.21$)