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Authors

Levine, Oscar P.

Wendle, Mark

Torres Barba, David

et al.

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Cardiac Testing and Return-to-Exercise Guidance in Non-Fulminant Myocarditis: A Mixed-Methods Study

Oscar Levine, MD, Mark Wendle, MD, David Torres Barba, MD, PhD, Ori Ben-Yehuda, MD
University of California San Diego, San Diego, CA

Background

- Cardiac testing, including cardiac troponin levels, transthoracic echocardiography (TTE), and cardiac magnetic resonance (CMR), is central to risk stratification and guides return-to-exercise recommendations following myocarditis.¹⁻⁴
- Contemporary guidelines show limited uniformity regarding the optimal selection and use of cardiac testing modalities.¹⁻⁴
- Real-world practice patterns and patient experiences remain poorly characterized.

Study Aim

To evaluate discharge exercise recommendations, cardiac testing, and patient perspectives on recovery following hospitalization for non-fulminant myocarditis.

Methods

- Single-center mixed-methods study of adults aged ≤ 50 years hospitalized with non-fulminant myocarditis between July 1, 2014 and June 30, 2024.
- Quantitative data were abstracted retrospectively and included discharge exercise recommendations, cardiac testing, and follow-up cardiology visits.
- Exercise recommendations were categorized by restriction duration and stratified by ejection fraction at presentation.
- Semi-structured interviews were conducted with a subset of patients and analyzed using reflexive thematic analysis.

Cohort Characteristics (n=57)

- Mean Age:** 27.6 ± 7.7 years
- Male:** 84%
- EF $< 50\%$:** 25%
- Pericardial involvement:** 63%
- CMR performed during admission:** 68%
- Mean length of stay:** 2.7 ± 1.9 days

Discharge Exercise Recommendations

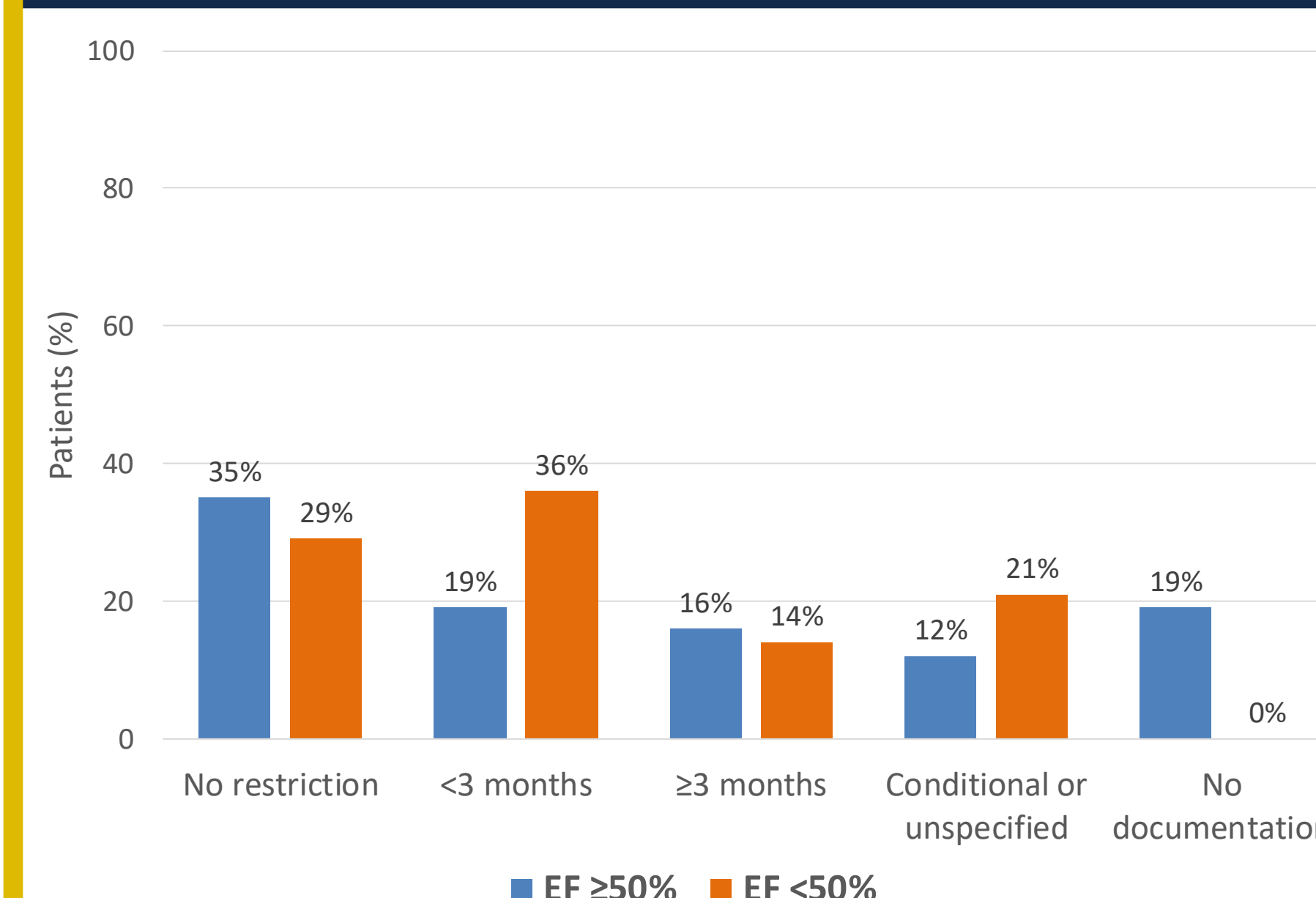


Figure 1. Distribution of exercise recommendations stratified by ejection fraction (EF). Bars represent the proportion of patients within each EF group (EF $\geq 50\%$ vs EF $< 50\%$) assigned to predefined exercise recommendation categories (no restriction, < 3 months, ≥ 3 months, conditional/unspecified, or no documentation).

Follow-Up Cardiac Testing

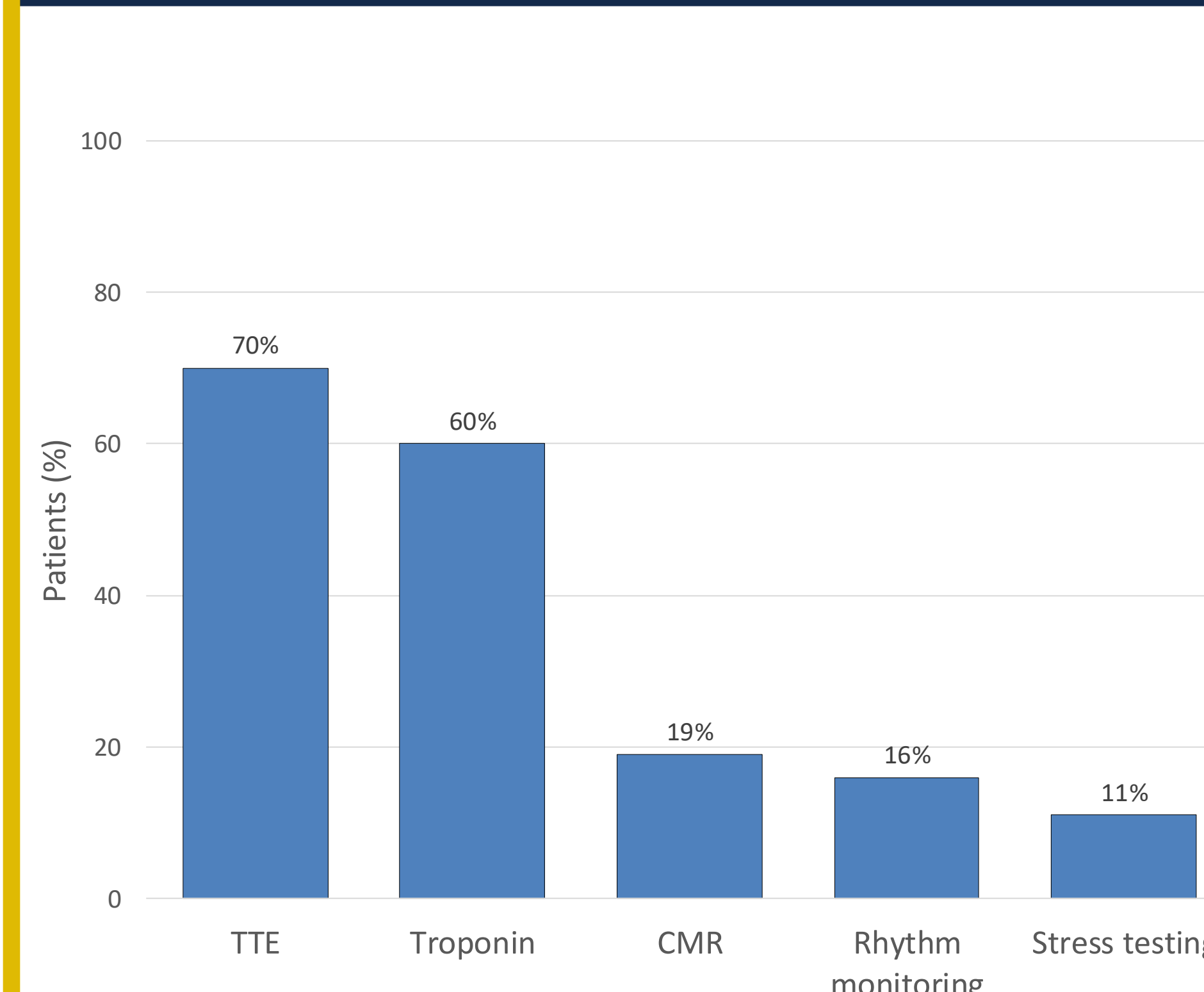


Figure 2. Follow-up cardiac testing after hospitalization for myocarditis. Bars represent the proportion of patients with outpatient cardiology follow-up (n = 37) who underwent each diagnostic modality, including transthoracic echocardiography (TTE), troponin measurement, cardiac magnetic resonance imaging (CMR), rhythm monitoring, and stress testing. Among patients with repeat testing, 82% demonstrated normalization of troponin, and all patients with reduced EF at presentation recovered to EF $\geq 50\%$ on follow-up TTE.

Qualitative Themes (n=16)

Inconsistent and Nonspecific Exercise Recommendations

"He said basically to avoid raising my heart rate for almost six months." (Participant 6)

"They said do what you can but don't stretch it too much." (Participant 12)

Additional Testing as a Source of Reassurance During Recovery

"After the stress test, they told me that I could go back to a lot more of the regular activities." (Participant 13)

"The only thing that I always wanted to get again, was an MRI follow up, but the doctor said it's not really necessary." (Participant 6)

Figure 3. Representative patient quotations illustrating key themes related to return to exercise and cardiac testing following myocarditis.

Conclusions

- Exercise recommendations were variable among patients hospitalized with non-fulminant myocarditis and often lacked specificity or tailoring to disease severity.
- Basic follow-up testing (repeat troponin and TTE) was performed in most patients with follow-up and generally showed favorable recovery.
- However, advanced evaluations (CMR, ambulatory rhythm monitoring, stress testing) were infrequently used despite being valued by patients and selectively recommended by guidelines.
- These findings highlight opportunities to better integrate cardiac testing into return-to-exercise guidance and post-discharge care.

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