In HF with mitral regurgitation, adding transcatheter mitral valve repair to medical therapy improved renal outcomes at 2 y

Damman, Kevin; Van Spall, Harriette G. C.

Published in:
Annals of Internal Medicine

DOI:
10.7326/J22-0037

CLINICAL IMPACT RATING

C ★★★★★☆☆

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Beohar N, Ailawadi G, Kotinkaduwa LN, et al. **Impact of baseline renal dysfunction on cardiac outcomes and end-stage renal disease in heart failure patients with mitral regurgitation: the COAPT trial.** Eur Heart J. 2022;43:1639-48.

Questions: In patients with heart failure (HF) and severe secondary mitral regurgitation (MR), does adding transcatheter mitral valve repair (TMVR) to medical therapy improve renal outcomes? Does treatment effect vary by baseline renal function?

Design: Post hoc analysis of a randomized controlled trial (COAPT [Cardiovascular Outcomes Assessment of the MitraClip Percutaneous Therapy for Heart Failure Patients with Functional Mitral Regurgitation]).

Blinding: Treatment allocation concealed; unblinded.*†

Setting: 78 centers in Canada and the USA.*

Patients: 614 patients (mean age, 72 y; 64% men) who had HF; left ventricular ejection fraction, 20% to 50%; left ventricular end-systolic diameter ≤70 mm; moderate-to-severe (grade 3+) or severe (grade 4+) secondary MR; and ongoing symptoms despite maximally tolerated, guideline-directed medical therapy (GDMT). Key exclusions: severe pulmonary hypertension or symptomatic moderate or severe right ventricular dysfunction.

Interventions: TMVR, using the MitraClip device, plus GDMT (n = 302)*, or GDMT alone (n = 312)*.

Funding: Abbott.

*Some information from Stone GW, Lindenfeld J, Abraham WT, et al. Transcatheter mitral-valve repair in patients with heart failure. N Engl J Med. 2018;379:2307-18.

†See Glossary.

Results: TMVR + GDMT vs. GDMT alone in HF with moderate-to-severe or severe secondary MR (intention-to-treat analysis)

Outcomes	Renal dysfunction subgroups (n)‡	Event rates		At 2 y	
		TMVR + GDMT	GDMT alone	RRR (95% CI)§	NNT (CI)§
New-onset ESRD‖	All (569)¶	2.9%	8.1%	65% (23 to 84)	19 (15 to 54)
New renal replacement therapy	All (574)¶	2.5%	7.4%	66% (21 to 86)	21 (16 to 64)
Death or HF hospitalization**	No dysfunction (139)	33%	58%	42% (14 to 63)	5 (3 to 12)
	Moderate (323)	44%	65%	32% (15 to 45)	5 (4 to 11)
	Severe (144)	61%	77%	20% (0 to 38)	Not significant

eGFR = estimated glomerular filtration rate; ESRD = end-stage renal disease; GDMT = guideline-directed medical therapy; HF = heart failure; MR = mitral regurgitation; TMVR = transcatheter mitral valve repair; other abbreviations defined in Glossary. Primary outcome indicated by boldface.
‡No renal dysfunction = eGFR ≥60 mL/min/1.73 m^2; moderate: eGFR = 30 to <60 mL/min/1.73 m^2; severe: eGFR <30 mL/min/1.73 m^2.
§RRR, NNT, and CI calculated using GDMT event rates and hazard ratios in article.
‖eGFR <15 mL/min/1.73 m^2 or renal replacement therapy.
¶Analysis excludes patients with condition at baseline.
**Post hoc analysis by renal dysfunction subgroup: treatment–subgroup interaction, P = 0.62.

Bottom line:
In HF with moderate-to-severe or severe secondary MR, adding TMVR to GDMT reduced new-onset end-stage renal disease and new renal replacement therapy at 2 years.

Commentary: TMVR improves outcomes in HF with reduced ejection fraction (HFrEF) and moderate-to-severe or worse MR, but whether it does so in the setting of renal dysfunction is unknown. Patients with HFrEF often have renal dysfunction, which is associated with adverse outcomes. Neurohormonal and hemodynamic changes that cause congestion in HFrEF also impair renal function through increased renal venous pressure and progressive renal hypoperfusion (1). In clinical settings, renal dysfunction often limits use of life-saving GDMT in HFrEF and interventions requiring contrast.

In Beohar and colleagues' analysis of the COAPT trial, patients with HFrEF and at least moderate-to-severe MR had evidence of congestion, including limiting symptoms, markedly elevated N-terminal pro–B-type natriuretic peptide levels, and increased pulmonary pressures. The congestive state translated to a low estimated glomerular filtration rate (eGFR) at baseline for most patients; >75% had moderate or severe renal dysfunction.

Patients receiving GDMT alone had high 2-year risk for the composite of death or HF hospitalization, which was progressively more frequent with worsening renal function. TMVR reduced the incidence of renal replacement therapy, end-stage renal disease, and regardless of baseline renal function, the composite of death or HF hospitalization. These findings were consistent with data from nonrandomized registries, which showed an association between TMVR and improved eGFR at short- and long-term follow-up (2). Strong evidence for the effect of conventional mitral valve repair on renal function and renal outcomes is lacking.

TMVR may improve forward cardiac output, congestion, and renal perfusion, thereby improving cardiovascular and renal outcomes. In the context of positive primary COAPT results in patients with HFrEF and at least moderate-to-severe MR, Beohar and colleagues' analysis shows that reduced eGFR portends a poor prognosis that may be improved with TMVR.

Kevin Damman, MD, PhD
University of Groningen and University Medical Center Groningen
Groningen, The Netherlands

Harriette G.C. Van Spall, MD, MPH
McMaster University
Hamilton, Ontario, Canada

Disclosures: Disclosures can be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=J22-0037.

References

1. **Beldhuis IE, Lam CS, Testani JM, et al.** Evidence-based medical therapy in patients with heart failure with reduced ejection fraction and chronic kidney disease. Circulation. 2022;145:693-712.
2. **Lo KB, Dayanand S, Ram P, et al.** Interrelationship between kidney function and percutaneous mitral valve interventions: a comprehensive review. Curr Cardiol Rev. 2019;15:76-82.

This article was published at Annals.org on 7 June 2022. doi:10.7326/J22-0037

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