



SCIENTIFIC LETTER

Prevalence and prognosis of cirrhotic cardiomyopathy in hospitalized patients with decompensated cirrhosis



Prevalencia y pronóstico de la miocardiopatía cirrótica en pacientes hospitalizados con cirrosis descompensada

Cirrhotic cardiomyopathy (CCM) is a syndrome characterized by cardiac dysfunction in patients with end-stage liver disease in the absence of prior heart disease.¹ The prevalence of CCM has been reported very high as to 20–70% of patients with cirrhosis and associated with various negative outcomes.^{2,3} Its pathogenesis is related to inflammation, portal hypertension and hyperdynamic circulation that could gradually promote contractile dysfunction.^{2,3} The current diagnostic criteria of CCM was defined by Cirrhotic Cardiomyopathy Consortium, which consist of any of the systolic dysfunction criteria including left ventricular ejection fraction (LVEF) $\leq 50\%$ or absolute global longitudinal strain (GLS) $< 18\%$; and/or ≥ 3 of the following diastolic dysfunction criteria: septal mitral annular early diastolic velocity (e') < 7 cm/s or lateral e' velocity < 10 cm/s, mitral inflow early diastolic velocity (E) to e' ratio ≥ 15 , left atrial volume index (LAVI) > 34 mL/m², tricuspid regurgitation (TR) velocity > 2.8 m/s.^{1,4} Despite the increasing literature evaluating CCM, there is controversial data regarding

clinical implications and prevalence.^{2,3} On this background, the current report was aimed to assess the prevalence of CCM, systolic and diastolic dysfunction, and to assess clinical outcomes in patients with CCM hospitalized with decompensated cirrhosis.

We conducted a retrospective analysis of a prospective cohort of hospitalized patients with decompensated cirrhosis at Parc Taulí University Hospital between October 2017 and January 2020. Clinical and laboratory data were collected at admission, and mortality, complications, and cardiac events within one year. Echocardiographic parameters obtained 6 months before or after inclusion were collected and reviewed by cardiologists. This study was approved by Institutional Review Board (2024/5092).

A cohort of 125 patients were analyzed (77% male, 78% with alcohol-related cirrhosis). The median Child–Pugh and MELD score was 9 (7–10) and 15 (11–20), respectively. Among the entire cohort, 38 patients (30%) had an echocardiography, with a median of 4 days (0–28); six of these patients had pre-existing heart disease and were excluded from the analysis. No significant differences were found between those with and without an echocardiography, except that the former had a higher incidence of acute kidney injury and hepatocellular carcinoma compared to the latter. The main indication for performing an echocardiography was anasarca. Interestingly, no patient showed systolic dysfunction, either by LVEF or GLS. Nevertheless, 72% showed at least one parameter of diastolic dysfunction. Specifically, 9% had an E/e' ratio ≥ 15 , 16% had a septal e'

Table 1 Prevalence of systolic and diastolic dysfunction parameters.

	Systolic dysfunction			Diastolic dysfunction			
	Absolute GLS $< 18\%$	LVEF $< 50\%$	E/e' ratio ≥ 15	Septal e' veloc- ity < 7 cm/s	Lateral e' veloc- ity < 10 cm/s	TR veloc- ity > 2.8 m/s	LAVI > 34 mL/s ²
Number of patients (%) <i>n</i> = patients with measured variable	0 <i>n</i> = 8/32	0 <i>n</i> = 32/32	3 (9%) <i>n</i> = 15/32	5 (16%)	<i>n</i> = 14/32	9 (28%) <i>n</i> = 22/32	20 (63%) <i>n</i> = 27/32
Median values of the parameter (IQR)	−22.6 (−20 to (−23))	66 (65–70)	12 (8.5–14)	7.7 (6.6–9.2)	10.3 (7.7–13)	2.7 (2.5–3.0)	40 (32–48)

Global longitudinal strain (GLS); left ventricular ejection fraction (LVEF); mitral inflow early diastolic velocity (E); mitral annular early diastolic velocity (e'); tricuspid regurgitation (TR); left atrial volume index (LAVI).

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velocity < 7 cm/s or lateral e' velocity < 10 cm/s, 28% had a TR velocity > 2.8 m/s, and 63% had a LAVI > 34 mL/m² (Table 1). A total of 16% met the criteria for CCM, although some echocardiographic parameters included in the definition of CCM were not evaluated in 53% of patients. CCM was not associated with mortality, decompensation, or cardiovascular events. However, TR velocity was associated with higher mortality (p value = 0.05), and LAVI with a higher risk of decompensation (p value = 0.03).

Discussion

The prevalence and prognostic implications of CCM remain unclear. We reported the results of a prospective cohort of hospitalized patients with cirrhosis showing that 30% of patients had an echocardiography, mainly due to anasarca. Performing periodic echocardiography in waiting-list liver transplant candidates is a well-established recommendation¹; however, there is no specific recommendation for those who are not listed, and this needs to be defined in the future. Moreover, the estimated prevalence of CCM in our cohort was 16%, slightly lower of what has previously been reported (20–40%).² Nevertheless, in over half of the patients, some echocardiographic parameters included in the definition of CCM were not collected, emphasizing that this condition remains underrecognized. Interestingly, we found no patient with systolic dysfunction, in line with previous studies⁵ and at least 72% of patients presented at least one parameter of diastolic dysfunction, and some of them, correlated with prognosis. This is a retrospective cohort, with a small sample size, and echocardiography performed in different clinical settings, which clearly limited the study. However, the results underscore the high prevalence of diastolic dysfunction and the need for evaluating all the systolic and diastolic dysfunction parameters in those patients with cirrhosis with an echocardiography. Future studies are needed to clarify the prevalence and outcomes of CCM in different etiologies and disease stages, improve diagnostic methods, and explore potential therapeutic interventions.

Ethics approval statement

The study was conducted in accordance with the principles of the Declaration of Helsinki, as approved by the ethics committee (ref.: 2024/5092).

Patient consent statement

This is a retrospective, non-interventional study based on previously collected data. Obtaining informed consent was

not feasible; however, the study was approved by the ethics committee, ensuring compliance with ethical requirements.

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Conflicts of interest

The authors declare no conflicts of interest.

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