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Left atrial deformation analysis by 2D speckle tracking echocardiography in liver cirrhosis is a potential new tool for a better characterization of cirrhotic cardiomyopathy

Rimbas RC.[1]; Luchian LM.[2]; Chitroceanu AM.[2]; Rimbas M.[2]; Visoiu SI.[2]; Pop C.[2]; Vinereanu D.[2]

[1]Carol Davila University of Medicine and Pharmacy, University and Emergency Hospital Bucharest, Cardiology Department, Bucharest, Romania
[2]University of Medicine and Pharmacy Carol Davila, Bucharest, Romania

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Background. Cirrhotic cardiomyopathy (CCM) is defined as a cardiac dysfunction that includes mainly diastolic dysfunction (DD), generated by liver cirrhosis (LC). Its present diagnosis is based mostly on 2D conventional transthoracic echocardiography (TTE), with focus on diastolic dysfunction. However, there is no standardized algorithm for diagnosis of CCM. Role of the new methods, such as speckle tracking echocardiography (STE), for the diagnosis of CCM is still controversial.

Aim. To assess left atrial (LA) function by STE in LC, on top of conventional TTE, in order to establish role of LA function for the diagnosis of CCM.

Methods. 107 subjects were assessed by TTE and STE: 52 patients with LC (57 ± 9 yrs, 23 males), free of any cardiovascular disease or diabetes, and 55 age-matched normal subjects. TTE was used to measure LV indexed volumes and ejection fraction (LVEF), E/E' ratio, left atrial volume index (LAVi), and systolic pulmonary arterial pressure (sPAP); STE to measure global longitudinal strain (GLS) and LA functions: reservoir function by strain from MVC to MVO (LASr) and positive strain rate (LASRr), conduit function by strain from MVO to onset of atrial contraction (LAScd) and early negative strain rate during conduit phase (LASRcd), LA pump function by negative strain at MVC (LASct) and late negative strain rate during atrial contraction phase (LASRct) (Figure). NTproBNP was measured in all patients.

Results. LC patients vs. controls had lower SBP (112 ± 15 vs. 122 ± 12, P < 0.001), higher LV volumes and NTproBNP, but similar LVEF. They had lower GLS, and higher E/E', LAVi, and sPAP, suggesting higher LV filling pressure (Table). Meanwhile, they had lower LA reservoir, conduit, and pump functions(Table). By using current algorithm for the diagnosis of DD, 21% of LC patients had DD, 48% had no DD, and 31% had indeterminate grade. By adding assessment of LA reservoir function by STE (LASr < 35%) to the DD algorithm, 50% of patients had DD, without any indeterminate cases.

Conclusion. LC patients have longitudinal systolic LV dysfunction, diastolic dysfunction with higher estimated LV filling pressure, and lower LA reservoir, conduit, and pump functions. By adding LA deformation analysis by STE to the current diagnosis algorithm, better characterization of CCM is possible.

Table

Group (N)	NTproBNP ng/ml	GLS (%)	E/E'	LAVi (ml/m2)	sPAP (mmHg)	LASr (%)	LASRr	LAScd (%)	LASRcd	LASRct
LC (52)	215 ± 258	-20.8 ± 3	8.5 ± 2.3	44 ± 14	27 ± 9	28 ± 9	1.29 ± 0.4	14.7 ± 8.1	-1.2 ± 0.42	-1.64 ± 0.47
Controls (55)	44 ± 43	-22 ± 2	7.6 ±2.3	28 ±6.5	21 ± 8	35 ± 4	1.54 ± 0.4	18.3 ± 6.7	-1.7 ± 0.61	-1.93 ± 0.44
P value	<0.001	0.05	0.05	0.001	0.003	0.011	0.002	0.014	0.001	0.002

Abstract P324 Figure