Prognosis of diastolic dysfunction in patients with preserved LVEF. Value of left atrial strain

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Funding Acknowledgements: None.

Introduction: The assessment of diastolic function is of paramount importance in a context of an epidemic of HFpEF. (1) Left atrial reservoir strain (LARS) <18% identifies patients with elevated filling pressures when one of the three standard criteria is not available. (2) However, LARS has better accuracy in patients with reduced than preserved EF. (2,3) The aim of our study was to assess the prognosis of patients with preserved LVEF according to the different grades of diastolic function and to determine whether LARS can improve the prognostic assessment of these patients.

Methods: Observational, prospective, single-center study. We included 364 patients referred for transthoracic echocardiography at the indication of their responsible physician. Inclusion criteria were: LVEF >50% and sinus rhythm. Diastolic function was assessed according to current ASE/EACVI guidelines. LARS was measured in 4 and 2 chambers, obtaining a mean value. Clinical and echocardiographic parameters were evaluated. The primary endpoint was a combined event of heart failure (HF), atrial fibrillation (AF) or stroke, whichever occurred first. Events were recorded from the electronic medical record.

Results: 364 patients were included (53% women), age 68 years (±14), LVEF Simpson 64.4% (± 6.9), BMI 28.31 (±5.65). Patients were grouped into 4 groups: normal diastolic function (NDF) 88 patients, grade 1 diastolic dysfunction (DD1) 88 patients, grade 2-3 diastolic dysfunction (DD2-DD3) 114 patients and indeterminate diastolic function or diastolic dysfunction of undetermined grade (IDF-DDI) 76 patients. After a mean follow-up of 2.44 (±1.03) years, 55 events were recorded (15% of the sample). Compared to patients with NDF (1 event/88 patients), those with DD1 had no increased risk, HR 0.73 (0.05- 11.87), p=0.82, while those with IDF-DDI and DD2-DD3 had increased risk of events, HR 9.21 (1.16-73.35), p=0.04 and HR 16.88 (2.09- 136.31), p=0.008, respectively. Figure 1.

On the other hand, compared to patients with LARS >24%, those with a LARS 18-24% and with a LARS ≤18% presented higher risk of events, HR 2.99 (1.37- 6.53), p=0.006 and HR 5.25 (2.14- 12.88), p=0.0003, respectively. Figure 2A. Analyzing only patients with IDF-DDI, again those with LARS ≤18% and LARS 18-24% were at higher risk than those with LARS >24%. Figure 2B.

Conclusions: In our population of patients with preserved LVEF and sinus rhythm, those with DD2-DD3 and with IDF-DDI are at increased risk of presenting combined HF/ AF/stroke events, not so those with DD1. A LARS value ≤24% identifies patients at increased risk of events, also in those with IDF-DDI. Therefore, from a prognostic point of view, in our study a LARS value ≤24% better identifies patients at increased risk of events than a LARS value ≤18%. This could have implications in AF screening and risk factors management. More studies will be needed to confirm these results.
Figure 1. Kaplan-Meier curves of combine

Figure 2. Kaplan-Meier curves for the pr