Imaging – Echocardiography, Systolic and Diastolic Function

The prevalence of indeterminate diastolic function in hypertensive women: 2024 BSE guidelines versus 2016 ASE/EACVI guidelines

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Background: There is a significant number of patients with indeterminate diastolic function (DF) using 2016 ASE/EACVI guidelines. The left atrial (LA) longitudinal strain could provide additional information in case of inconclusive results. Recently, a new 2024 BSE guidelines incorporated LA strain as routine measure of DF. However, there is still a grey-zone within a range of 18–29% for LA reservoir strain (LARs). The purpose of this study was to compare the prevalence of indeterminate DF based on the 2016 ASE/EACVI and 2024 BSE guidelines.
Methods: The study enrolled 100 postmenopausal women (mean age 57 ± 4 years) with uncomplicated arterial hypertension and normal systolic function. The cohort was divided into 3 groups (normal DF, indeterminate DF, diastolic dysfunction). The DF was assessed with both 2016 ASE/EACVI and 2024 BSE algorithms. The initial assessment of DF included average E/e' ratio, left atrial volume index and tricuspid regurgitation velocity with BSE algorithm. LARs was analyzed, when only 2 criteria were available (1 positive and 1 negative). The LARs ≥ 30 % or pump strain ≥ 14 % were considered normal. The LARs < 18 % was abnormal. The range between 18-29 % was a grey-zone area.
Results: The prevalence of indeterminate DF was significantly lower with assessment by 2024 BSE versus 2016 EACVI/ASE algorithm (21 % vs 53 %). The proportion of patients with normal DF was significantly higher with BSE guidelines (72 % vs 40 %). Surprisingly, the presence of DD was the same (7 % using both algorithms) (Table). The tricuspid regurgitation was absent in 75 % of patients, leaving only 2 initial criteria for DF assessment with BSE guidelines. Among these patients 40 % had 2 negative criteria and 3 % had 2 positive criteria. 32 % had 1 positive and 1 negative criteria. Thus, a third of patients required additional evaluation with LA strain. 21 % of patients had LARs in a range between 18% and 29 % or pump strain < 14 % with indeterminate DF status. These patients need further evaluation.
Conclusions: Adding LA strain to the 2024 BSE DF assessment algorithm significantly reduced the number of indeterminate results. However, one fifth of hypertensive women had left atrial strain values in the gray zone area.

Diastolic function assessment

Parameter	Normal diastolic function	Indeterminate function	Diastolic dysfunction	p
2016 EACVI/ASE guidelines				
Prevalence, %	40	53	7	
E/e' ratio	8,8 (7,74-10,1)	10 (8,6-11,7)*	14 (12-14,9)*^	p<0,0001
LA volume index, ml/m^2	31,2 (28,7-33,6)	36,6 (34,8-40) *	38,7 (35,5-43,5) *	p<0,0001
LARs, %	34,2 (28,4-39,1)	30,8 (26,5-34,8)	29,6 (25,1-37,8)	p=0,18
LA pump strain, %	15,3 (13,6-17,4)	14,9 (13-17,1)	12,1 (10,7-16,1)	p=0,36
2024 BSE guidelines				
Prevalence, %	72	21	7	
E/e' ratio	9,05 (8-10,4)	10,8 (9,5-13) *	12,5 (10,7-14,9) *	p=0,001
LA index, ml/m^2	32,4 (28,8-36)	38 (35,5-40) *	38,7 (34,9-48,1) *	p<0,0001
LA GLS, %	33,9 (29,2-37,3)	27,7 (23,6-28,9) *	27,3 (23,4-37,8)	p=0,0002
LA pump strain, %	15,5 (14,2-17,6)	14 (12,2-16)	11,4 (9-13,1)	p=0,0032

The values are given as median and interquartile range. * - compared to normal function
^ - compared to indeterminate result