How to diagnose diastolic heart failure: a consensus statement on the diagnosis of heart failure with normal left ventricular ejection fraction by the Heart Failure and Echocardiography Associations of the European Society of Cardiology

I read with great interest the updated European Society of Cardiology guidelines on the diagnosis of heart failure with normal LV ejection fraction (HFNEF), which represent a big step forward relative to the former guidelines.2 I am convinced that these concise and practical recommendations will set the standard of how to diagnose diastolic heart failure for both routine clinical praxis and future studies on HFNEF.

However, regarding the tissue Doppler assessment of left ventricular diastolic dysfunction, I would like to challenge the recommendation that the E/E′ cut-off values are based on … averaged velocities of lateral and septal mitral annulus.1 The guideline article proposes an E/E′ cut-off value of more than 15 for diagnostic evidence of presence and less than 8 for absence of diastolic LV dysfunction. As correctly cited, these cut-off values are derived from a well-designed study of Ommen et al.3 However, Ommen et al. did not recommend to use averaged annular velocities but refer to the septal E/E′ ratio which correlated better with mean left ventricular diastolic pressure than ratios calculated with velocities taken from the lateral annulus or averaged over the medial and lateral annulus. Moreover, septal E/E′ ratios were easier to obtain and showed a larger area under the ROC curve than ratios taken from the lateral annulus.3 In another paper,4 the same group corroborated and extended its findings by showing that the septal E/E′ ratio is a powerful predictor of survival after myocardial infarction.

Admittedly, other groups which came to different results in comparing the predictive values of septal and lateral E′ values have advocated the use of averaged annular velocities,5,6 but nevertheless the original set of two cut-off values for E/E′ (8 and 15), which is currently used in the ESC guidelines stems from Ommen et al.

Hence, in the absence of a clear evidence for the superiority of averaged values and for the sake of ease and feasibility particularly in daily routine echocardiography, the recommendation to take averaged E′ values should be modified.

References


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How to diagnose diastolic heart failure: a consensus statement on the diagnosis of heart failure with normal left ventricular ejection fraction by the Heart Failure and Echocardiography Associations of the European Society of Cardiology: reply

The authors appreciated Dr Kindermann’s interest in our consensus document on ‘How to diagnose diastolic heart failure?’1 and understand his concern on the use of averaged tissue Doppler (TD) lateral and septal mitral annular lengthening velocities to calculate the E/E′ ratio (E/E′ave). The consensus document considers an E/E′ave > 15, derived from real-time pulsed TD, diagnostic evidence for diastolic LV dysfunction and requires additional noninvasive investigations for the diagnosis of diastolic LV dysfunction if the E/E′ave is encompassed in between 8 and 15. These cut-off values were indeed first proposed by Ommen et al.,2 who preferred the septal mitral annular lengthening velocity for the calculation of the E/E′ ratio (E/E′ave). In patients with LV ejection fraction (EF) < 50% and elevated mean LV filling pressures (16.9 ± 6.4 mmHg), this study however observed equally strong correlations between mean LV filling pressures and E/E′ ave (r = 0.60) or E/E′ave > 15 to E/E′ave (r = 0.60). Only in patients with LVEF > 50% was the correlation between mean LV filling pressures and E/E′ ave (r = 0.47) slightly better than E/E′ave > 15 (r = 0.45). These patients however had normal mean LV filling pressures (11.4 ± 5.6 mmHg). The better correlation observed in this group can therefore not be extrapolated to patients with heart failure and normal LV ejection fraction (HFNEF). A similar study3 correlating mean pulmonary capillary wedge pressure (PCWP) with E/E′ave also revealed E/E′ave > 15 to be the optimal cut-off value to predict elevated PCWP. These investigators preferred the use of E/E′ave following a prior study, in which they had compared E′ ratios using lateral, septal, anterior, inferior, average of two, average of three, and average of four mitral annular lengthening velocities. In this study, the use of averaged lateral and septal mitral annular lengthening velocities yielded the best correlation with PCWP even in the presence of segmental LV dysfunction. Recently, the E/E′ ratio using the lateral mitral annular lengthening velocity (E/E′lat) and E/E′ave was correlated in HFNEF patients with a conductance catheter derived LV stiffness modulus.5 In this study, only E/E′lat correlated with the LV...