

Strain Evaluation of Left Atrial Function: Ready for the Future?

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Dear Editor,

Left atrial function is often under-evaluated in the standard echo examination, although this chamber plays a key role in heart function. Probably, mis or late diagnoses of atrial dysfunction are due to technical difficulties such as the thin wall thickness, the lack of robust parameters for functional assessment, and the number of factors potentially affecting or influencing the atrial activity. On the other hand, clinical studies have demonstrated that left atrial dysfunction heavily impacts on morbidity and mortality (1-3). Strain and strain rate imaging (S-SR) is a new echo technique able to study ventricular and atrial function. In particular, S-SR is capable of verifying the elasticity of the atrial wall, bearing in mind that increased atrial stiffness is linked to atrial fibrosis and (as a consequence) to higher arrhythmic risk. Many factors are involved in atrial stiffness such as age, diabetes, hypertension, valvulopathies, obesity, cigarette smoking, left ventricular diastolic function, left ventricular hypertrophy, myocardial infarction, arrhythmias, and dyslipidemia as well as its duration. In their study, Sahebjam et al. (4) found that hypertension was the only determinant of S-SR impairment, although in multivariate analysis, none of the parameters (including systolic and diastolic blood pressure) correlated with atrial S-SR. These data, as well as the differences with the studies cited in the article (5), are not surprising given the high prevalence of comorbidity after the fifth decade of life. In addition, disease duration, early diagnosis, therapy efficacy, class(es) of the drug used, and relative dose are all "confounding factors" and are as such hard to be controlled. For these reasons, very large cohorts are needed to give statistical power to such a complex multivariate analysis. The impact of a single factor on atrial S-SR could be studied in pediatric age (6), when comorbidities and drug use are less common. Unfortunately, in pediatric age, it is difficult to demonstrate the clinical relevance of the results obtained. On the other hand, large population

studies on adults have shown that, independent of specific causes, impaired diastolic function is related to higher mortality and morbidity(7).

The results obtained by Sahebjam et al. demonstrate that, despite normal left atrial volumes, S-SR is lower in patients with one or more cardiovascular risk factors, increasing the evidence of high sensibility of this technique for screening higher-risk patients in different morbid conditions (8). In this way, S-SR could be a precious parameter of a bad outcome: left atrial volume enlargement could be, in fact, late evidence of diastolic dysfunction, and, at that time, the fibrotic process may be (at least partially) irreversible.

Limitations to a routine use of S-SR are due to inter-operator and inter-software variability (between speckle tracking and tissue Doppler or between two different software packages), poor familiarity of peripheral cardiologists with the technique, costs of special echo machines and software, time needed for post-processing, and lack of age-related normal values. However, S-SR imaging remains an essential method for a better understanding of the mechanic of the heart, an excellent research tool, and reliable software to settle tricky differential diagnoses. If, at the moment, its use is relegated to third-level cardiology centers, software improvements (in terms of reproducibility and automation) could open the way toward a routine use in the future.

Was this true glory? The high doom must be pronounced by times to come. Alessandro Manzoni, 5th May

Authors' Contribution

Both authors worked equally in writing the manuscript.

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