Abstract: 4312

Left ventricular systolic function in patients with systemic lupus erythematosus and its association with cardiovascular events

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Introduction: Systemic lupus erythematosus (SLE) is a chronic autoimmune disorder that may involve the cardiovascular system. Diagnosis of cardiac involvement, particularly at an early stage, represents challenge since symptoms in SLE patients are often atypical and current diagnostic tools are characterized by a low sensitivity to detect myocardial dysfunction. Purpose of this study was to assess left ventricular (LV) systolic function in a large cohort of SLE patients in comparison with a control group of healthy subjects and using standard echocardiographic measures and global longitudinal strain (GLS) by 2D speckle tracking analysis. Furthermore, the association between echocardiographic parameters and the occurrence of cardiovascular events was tested. Methods: A total of 102 patients (87% female, 42±15 years) were analysed including echocardiography at the time of their first visit. All patients fulfilled the American College of Rheumatology (ACR 1997) and The Systemic Lupus Erythematosus International Collaborating Clinics (SLICC 2012) classification criteria for SLE. During follow-up, cardiovascular events included cerebrovascular accident or transient ischemic attack, pulmonary embolism, coronary artery interventions, hospitalisations for heart failure and development of supraventricular arrhythmias. The control group consisted of 50 age- and gender-matched healthy subjects. Results: Prevalence of comorbidities, such as hypertension (8%), hypercholesterolemia (4%) and diabetes mellitus (2%) was relatively low in SLE patients. In comparison with the control group, SLE patients were characterized by worse LV systolic function as measured by LV ejection fraction (51±6% vs 62±6%, p<0.001) and by LV GLS (-15±3% vs -19±2%, p<0.001), as well as worse LV diastolic function (e’ septal: SLE 9±2 cm/s vs 10±2 cm/s healthy controls, p=0.020; E/e’: SLE 8±3 vs 7±2 healthy controls, p<0.001; TR velocity: SLE 2±0.6 m/s vs 1.6±0.5 m/s healthy controls, p=0.020). During a median follow up of 11 years (Interquartile range: 4-19 years), 43 (42%) patients developed cardiovascular events. Kaplan-Meier curves show that SLE patients with more impaired GLS (based on the median value of -15%) experienced higher cumulative rates of cardiovascular events as compared to patients with GLS=-15% (Chi-square 7.197; Log rank p=0.007). On uni- and multivariate Cox-regression models, LV GLS demonstrated significant association with cardiovascular events (HR:2.229; 95% CI: 1.024-4.853; p=0.043), together with age (HR:1.043; 95% CI: 1.017-1.069; p=0.014) after correcting for LV mass index and e’; in turn, LV ejection fraction was not significantly associated with cardiovascular events. Conclusions: In SLE patients, LV systolic function as measured by GLS is significantly impaired and independently associated with cardiovascular events. Incorporation of LV GLS in the early assessment of these patients may significantly improve risk-stratification for cardiovascular events.
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