Relationship of anti-double stranded DNA antibody titers and echocardiographic parameters in systemic lupus erythematosus patients

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BACKGROUND

Systemic lupus erythematosus (SLE) is a chronic inflammatory disease, characterized by the deposition of immunocomplexes on vital organs such as the heart, brain, and kidneys. High autoantibodies titers have been associated with a worse cardiovascular prognosis.

OBJECTIVE

We aimed to evaluate the association between anti-double stranded DNA antibody (anti-dsDNA) titers and echocardiographic parameters in SLE patients.

METHODS

This was a cross-sectional study. We recruited a total of 67 patients with SLE diagnosis, according to the 2019 EULAR/ACR classification criteria, aged ≥ 18 years. A transthoracic echocardiogram was performed by two certified echocardiographers blinded to clinical information. A blood sample was drawn to measure anti-dsDNA titers. Distribution was evaluated with the Kolmogorov-Smirnov test. Correlations between anti-dsDNA titers and echocardiographic parameters were determined with Spearman's correlation coefficient (rs). A *p*-value < 0.05 was considered statistically significant.

RESULTS

Demographic and clinical characteristics in Table 1. We found a moderate positive correlation between anti-dsDNA and left ventricular mass index (rs = 0.332, $p = 0.006$), a moderate positive correlation between anti-dsDNA and the ratio between early mitral inflow velocity and mitral annular early diastolic velocity (E/e') (rs = 0.368, $p = 0.003$), and a moderate positive correlation between anti-dsDNA and pulmonary arterial systolic pressure (PASP) (rs = 0.326, $p = 0.013$) (Table 2).

Table 1. Demographic and clinical characteristics.

Characteristics	SLE patients (n=67)
Age, years, median (IQR)	37.0 (24.0-42.0)
Women, n (%)	60 (89.6)
T2DM, n (%)	3 (4.5)
HTN, n (%)	14 (20.9)
Dyslipidemia, n (%)	4 (6.0)
Obesity, n (%)	9 (13.4)
Active smoking, n (%)	8 (11.9)
Disease duration, months, median (IQR)	72.0 (28.0-120.0)
SLEDAI, median (IQR)	8.0 (4.0-12.0)
Hydroxychloroquine, n (%)	59 (88.1)
Glucocorticoids, n (%)	54 (80.6)
LV mass index, g/m^2, median (IQR)	60.14 (47.69-77.77)
E/e', median (IQR)	6.58 (5.80-8.45)
LAVI, ml/m2, median (IQR)	26.46 (20.71-31.26)
LVEF, %, mean ± SD	57.86 ± 6.76
GLS, %, mean ± SD	-18.97 ± 3.30
TAPSE, mm, mean ± SD	22.0 (20.0-24.0)
PASP, mmHg, mean ± SD	23.15 ± 7.63

SLE, systemic lupus erythematosus; T2DM, type 2 diabetes mellitus; SLEDAI, Systemic Lupus Erythematosus Disease Activity Index; LV, left ventricular; E/e', the ratio between early mitral inflow velocity and mitral annular early diastolic velocity; LAVI, left atrial volume index; left ventricular ejection fraction; GLS, global longitudinal strain; TAPSE, tricuspid annular plane systolic excursion; PASP, pulmonary arterial systolic pressure.

Table 2. Correlation between anti-dsDNA antibodies and echocardiographic parameters.

	LV mass index	E/e'	LAVI	LVEF	GLS	TAPSE	PASP
Anti-dsDNA	rs=0.332 *p*=0.006	rs=0.368 *p*=0.003	rs=0.157 *p*=0.220	rs=0.002 *p*=0.989	rs=0.011 *p*=0.937	rs=-0.004 *p*=0.973	rs=0.326 *p*=0.013

Anti-dsDNA, anti-double stranded DNA antibodies; LV, left ventricular; E/e', the ratio between early mitral inflow velocity and mitral annular early diastolic velocity; LAVI, left atrial volume index; left ventricular ejection fraction; GLS, global longitudinal strain; TAPSE, tricuspid annular plane systolic excursion; PASP, pulmonary arterial systolic pressure.

CONCLUSION

Higher titers of anti-dsDNA are associated with higher left ventricular mass index, E/e', and PSAP, which could lead to the development of ventricular hypertrophy, diastolic dysfunction, and pulmonary hypertension respectively. The performance of a transthoracic echocardiogram may be helpful to detect early cardiovascular abnormalities in SLE patients, especially those with high anti-dsDNA titers.

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