Left atrial strain and risk of systemic embolic event in rheumatic mitral stenosis with sinus rhythm

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Backgrounds: Stroke and systemic embolism might be an important complication of rheumatic mitral stenosis (MS) even though patients are in sinus rhythm (SR), but the risk of embolic events in this population are not well studied.

Purpose: We aimed to evaluate the risk factors of embolic events in patients with rheumatic MS and SR.

Methods: From the multi-center retrospective registry of 2426 patients with rheumatic MS, we included patients with rheumatic MS and SR (n=583) between January 2000 and December 2021. After exclusion of patients who had history of systemic embolic events, taking the anticoagulants, combined significant aortic valve dysfunction, and a history of valve surgery. We finally analyzed 443 patients. The primary outcome was defined as composite of stroke, transient ischemic attack, noncentral nervous system embolism.

Results: Among 448 patients (77.1% female; mean age, 52.3 ± 10.1 years), systemic embolic events developed in 38 (8.4 %) patients with annual incidence rate of 4.6/100 person-year during mean follow-up period of 96.4 ± 61.1 months (median 94.2 months). Patients who had systemic embolic events were significantly older and had higher the prevalence of hypertension and diabetes than those who did not, without significant differences in left atrial (LA) dimensions, volumes, pulmonary artery systolic pressure. Instead, LA strain was significantly impaired in patients with systemic embolic events (19.1 ± 9.3 vs. 15.5 ± 8.07, p= 0.034). In the multivariate analysis, LA strain was independent predictors of systemic embolic events [HR 0.96, 95% CI: 0.93-0.99; P = 0.021], after adjustment for confounding factors. The impaired LA strain (LA reservoir strain < 16.6 %) also had incremental prognostic value for development of systemic embolic events over clinical factors and traditional echocardiographic parameters (Figure).

Conclusions: Impaired LA strain is a predictor of stroke and systemic embolism in patients with rheumatic MS in SR. Considering the risk for embolism, oral anticoagulation might be considered in patients with rheumatic MS in SR and impaired LA strain.

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**Figure**

- **Model 1**: Global Chi Square with Clinical factors
- **Model 2**: Global Chi Square with Clinical factors + LAVI
- **Model 3**: Global Chi Square with Clinical factors + LAVI + MVA by 2D
- **Model 4**: Global Chi Square with Clinical factors + LAVI + MVA by 2D + LA strain

*Age, Sex, HTN, DM