Impact of disease stage on performance of strain markers for prediction of atrial fibrillation

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Topic(s):
Tissue Doppler, Speckle Tracking and Strain Imaging

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Background: Efforts to predict incident atrial fibrillation(AF) may be associated with complications, and there is interest in AF prediction in primary prevention(PP;pts with risk factors) and secondary prevention(SP;pts with possible AF complications). These pts have different risk levels, we sought whether that influenced the predictive value of LV dysfunction(measured as global longitudinal strain, GLS) or LA dysfunction(LA reservoir strain).

Methods: The PP cohort comprised 351 community-based pts =65 years with =1 risk factor for AF(age 70±4y,43% male, median follow-up 22 months) and the SP cohort comprised 532 pts after transient ischaemic attack or stroke(age 68±12y, 51% male, median follow-up 36 months). GLS and LA strain were measured offline(Image Arena-Tomtec, Germany). AF was diagnosed by 12 lead ECG, Holter or by single lead monitor. The clinical and echocardiographic characteristics of those with AF were compared to those in sinus rhythm. Nested Cox-regression models were used to assess for independent and incremental predictive value of LA strain/GLS in both cohorts.

Results: Compared to SP, PP had higher clinical AF risk(CHARGE-AF 5.6±5.5% vs 4.7±12.1%, p=0.02) but a lower thromboembolic risk(CHA2DS2-VASC 3±2 vs.4±2, p<0.001). AF developed in 42 PP pts(12%) and 61 SP(12%). AF patients were older, with higher CHARGE-AF score, LA volume and LV mass. Pts developing AF had reduced GLS(17±4% vs.20±3%, p<0.001), reservoir(28±11% vs.35±8%, p<0.001) and pump strain(13±7% vs.17±5%, p<0.001). GLS and LA strain had greater AUC in SP(0.84 vs 0.58 for GLS and 0.85 vs 0.57 for reservoir strain, both p<0.001). Nested cox-regression models showed that LA reservoir strain was independently associated with AF in both cohorts(p<0.05). GLS was only independently associated with incident AF in SP(Figure).

Conclusion: LA reservoir strain is independently associated with AF in different risk cohorts and its effect is incremental to clinical parameters and LA volume. GLS may be more useful in AF risk assessment in those in SP.
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Conclusion: LA reservoir strain is independently associated with AF in different risk cohorts and its effect is incremental to clinical parameters and LA volume. GLS may be more useful in AF risk assessment in those in SP.