Left atrial cardiomyopathy for long-term prediction of clinical outcomes in hypertensive patients

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Background: The concept of left atrial cardiomyopathy (LACM) encompasses complex of electrophysiological, structural and functional abnormalities. It is assumed that different degrees of atrial fibrosis determine the differences in clinical variations of LACM from asymptomatic forms to manifest cases including atrial fibrillation (AF). This study tried to evaluate the prognostic value of LACM for clinical outcomes.

Methods: Prospective observational study included 408 hypertensive patients [median age 63 yrs, 50,5% men] with LV ejection fraction >50%. LACM was defined as P-wave terminal force in lead $V_1 > 0,04$ mm×s and/or LA size >4,3 sm for women and >4,7 sm for men. The primary endpoint of the study was defined as ischaemic stroke/TIA. The secondary endpoints defined as new AF and all-cause death. Survival analysis was performed using Kaplan-Meier test, comparing survival graphics through Log-Rank test. For multivariate analysis Cox regression was performed. Parameters that showed significance in the univariate analysis were included.

Results: Pts were divided in 3 groups: no-LACM-group (n=124, median age 61 yrs), LACM-group (n=84, median age 56 yrs), AF-group (n=200, median age 65 yrs). Median CHA_2DS_2VASc scores were 2 (2; 3), 2 (1; 3) and 2 (2; 3), respectively (p=0,001). There were 23 (5,6%) stroke/TIA, 10 (4,8%) new AF and 74 (18,1%) death during median period 9,0 yrs of follow-up.

The cumulative incidence for stroke/TIA were significantly differ between the groups, of 2 (1,6%) in no-LACM-group, 10 (11,9%) in LACM-group and 11 (5,5%) in AF-group ($\chi^2 = 9,191$; p=0,01). There was no difference between LACM- and AF-groups ($\chi^2=3,413$; p=0,065). In multivariate Cox regression global peak LA longitudinal strain (PALS) in the reservoir (r) phase (HR 0,614, 95%CI 0,374-0,991; p=0,033) was independent predictor of stroke/TIA in LACM-group whereas PALS in the contractile (c) phase (HR 1,202, 95%CI 1,002-1,442; p=0,008), LV global longitudinal strain (HR 0,752, 95%CI 0,604-0,936; p=0,011), LV ejection fraction (HR 0,899 95%CI 0,816-0,991; p=0,033) and CHA_2DS_2VASc score (HR 2,101, 95%CI 1,263-3,495; p=0,004) were independent risk factors in AF-groups.

LACM was associated with higher cumulative incidence for new AF in comparison with no-LACM patients (9,5% vs 1.6%, $\chi^2=6,370$; p=0,012). The multivariate analysis showed CHA_2DS_2VASc score (HR 5,362, 95%CI 1,772-16,226; p=0,003) and LA empting fraction (HR 0,584, 95%CI 0,365-0,933; p=0,024) to be predictors of the new AF.

Kaplan-Meier curves and log-rank test demonstrated significantly lower survival of patients in AF-group ($\chi^2=22,278$; p < 0,0001). In multivariate analysis documented AF at baseline (HR 1,753, 95%CI 1,360-1,905; p=0,004), CHA_2DS_2VASc score (HR 1,573, 95%CI 1,242-1,992; p<0,0001), duration of arterial hypertension (HR 1,070, 95%CI 1,009-1,135; p=0,023) and carotid-femoral pulse wave velocity [PWV] (HR 1,182, 95%CI 1,015-1,376; p=0,031) independently predicted the risk of all-cause death.

Conclusion: Categorization into LACM-group had a capacity as predictive value for stroke/TIA and new AF. The risk of primary endpoint was comparable between pts with LACM and AF. CHA_2DS_2VASc score as well as AF, duration of arterial hypertension and PWV were independently associated with all-cause death.