Abstract: P3767
Progressive left atrial remodeling associates with cholesterol efflux capacity of HDL in atrial fibrillation patients

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Topic(s):
Atrial Stressors Causing Atrial Fibrillation

Citation:
European Heart Journal (2019) 40 (Supplement), 2364

Background: The clinical significance of high-density lipoprotein (HDL) function, represented by cholesterol efflux capacity (CEC), in addition to serum HDL cholesterol (HDL-C) levels, has been recognized in the pathogenesis and prognosis in patients with atherosclerotic cardiovascular diseases. However, the roles of HDL in the development and the progression of atrial fibrillation (AF), has been rarely evaluated. In this study, we thus hypothesized that the compromised HDL function may be associated with the progression of pathological structural remodeling in left atrium (LA).

Objective: We explored the association between CEC of HDL and the left atrial dimension (LAD), a maker of structural remodeling in the LA, in patients with AF and control.

Methods: This is a single center case-control study including consecutive 260 AF patients (AF group) and 34 paroxysmal supraventricular tachycardia (PSVT) patients (PSVT group, served as a control group), who underwent catheter ablation from July 2017 to December 2018. Blood samples were collected before catheter ablation procedure. CEC of HDL was measured by using ex vivo radiotracer system that involved incubation of [3H] cholesterol-loaded J774.1 murine macrophage-like cells with apoB-depleted serum.

Results: Serum HDL-C level was lower in AF group compared to those of PSVT group (55.3±15.3mg/dl vs 61.7±13.3mg/dl: p=0.024). As a marker of HDL function, CEC of HDL was significantly lower in patients with AF group compared to those in PSVT patients (4.74±0.84% vs 5.20±0.99%; p=0.005, Fig 1). In all patients including both groups, CEC of HDL was inversely correlated with LAD (r=−0.25; p<0.001, Fig 2), indicating the inverse association between HDL function and the progression of structural remodeling in AF. Moreover, multivariate logistic regression analysis adjusted by age, gender, body mass index, ejection fraction, and HDL-C demonstrated that increase in CEC of HDL was associated with the lower risk to be highest quartiles of LAD (>42mm), even adjusted by serum HDL-C levels (odds ratio of 1-SD elevation in CEC of HDL for LAD>42mm: 0.63; 95% confidence interval: 0.40–0.97, p=0.037), which implicated the link between HDL function and progression of left atrial structural remodeling.

Conclusion: Findings in this study may suggest that compromised HDL functionality is associated with the pathogenesis of left atrial structural remodeling in AF patients.
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Fig 1. Cholesterol efflux capacity
Fig 2. Correlation between cholesterol efflux capacity and left atrial dimension

Cholesterol efflux capacity (%)

PSVT AF

p=0.005

Cholesterol efflux capacity (%)

r=-0.25
p<0.001

Left atrial dimension (cm)