Abstract: P310

HDL-function in atrial fibrillation

Authors:
P Buettner¹, M Trieb², G Marsche², G Hindricks¹, A Arya¹, P Sommer¹, B Dinov¹, A Bollmann¹, D Husser¹, J Kornej¹, ¹Heart Center of Leipzig, Electrophysiology - Leipzig - Germany, ²Medical University of Graz, Institute for Experimental and Clinical Pharmacology - Graz - Austria,

Topic(s):
Basic Science - Cardiac Diseases: Arrhythmias

Citation:
Cardiovascular Research (2018) 114 (Supplement 1), S79

Background

Atrial fibrillation (AF) is a progressive disease leading to left atrial myocardial remodeling which can be detected during catheter ablation as low voltage areas (LVA). AF progression is underpinned by several pathomechanisms (e.g. fibrotic remodeling, hemodynamic alterations, and inflammatory processes) and is triggered by diverse risk factors (age, gender, lifestyle factors, and primary heart disease). Next to those established risk factors alterations in cholesterol levels were controversially discussed as AF risk factors. Recently, it was proposed that HDL function quality rather than HDL-cholesterol quantity might be associated with cardiovascular disease, as both HDL and AF are involved in the homeostasis of apoptotic, oxidative, and inflammatory processes implicating a potential link.

Purpose

HDL cholesterol efflux capacity was examined in a validated assay using 3H-cholesterol labelled J774 macrophages of apoB depleted sera from healthy individuals and AF patients with and without LVA.

Methods

Patients with AF undergoing catheter ablation (n=95) were free from statins and had no fibrotic heart, kidney, thyroid or liver disease. They were 61.5 +/- 11 years old, 46% female and 18% had left atrial LVA. Blood plasma samples were collected from femoral vein before catheter ablation. LVA were determined using high-density maps and were defined as potentials <0.5 mV. Controls (n=29) were 59 +/- 13 years old and 31% female. Cholesterol efflux from J774 macrophages which were labeled with [3H]cholesterol was measured following 4h incubation with apolipoprotein B-depleted proband serum. Radioactivity in supernatants and cells was then measured by liquid scintillation counting and set into relation with total radioactivity in medium and cells.

Results

HDL cholesterol efflux capacity of AF patients was significantly reduced compared to healthy individuals (8.00% ± 0.16 vs 11.00% ± 0.22, p < 0.001). Of particular interest, cholesterol efflux capacity tended to be lower in male AF patients and in patients with LVA compared to patients without LVA.

Conclusion

HDL-function is impaired in patients with atrial fibrillation. The effect depends on gender and AF progression state. Whether this effect is a consequence of AF associated processes like oxidative stress or a primary dysfunction is contributing to AF initiation or progression should be further studied.
Abstract: P310
HDL-function in atrial fibrillation
Authors: P Buettner1, M Trieb2, G Marsche2, G Hindricks1, A Arya1, P Sommer1, B Dinov1, A Bollmann1, D Husser1, J Kornej1
1Heart Center of Leipzig, Electrophysiology­ Leipzig­ Germany, 2Medical University of Graz, Institute for Experimental and Clinical Pharmacology­ Graz­ Austria, Topic(s): Basic Science­ Cardiac Diseases: Arrhythmias
Citation: Cardiovascular Research (2018) 114 (Supplement 1), S79

Background
Atrial fibrillation (AF) is a progressive disease leading to left atrial myocardial remodeling which can be detected during catheter ablation as low voltage areas (LVA). AF progression is underpinned by several pathomechanisms (e.g. fibrotic remodeling, hemodynamic alterations, and inflammatory processes) and is triggered by diverse risk factors (age, gender, lifestyle factors, and primary heart disease). Next to those established risk factors alterations in cholesterol levels were controversially discussed as AF risk factors. Recently, it was proposed that HDL function quality rather than HDL-cholesterol quantity might be associated with cardiovascular disease, as both HDL and AF are involved in the homeostasis of apoptotic, oxidative, and inflammatory processes implicating a potential link.

Purpose
HDL cholesterol efflux capacity was examined in a validated assay using 3H-cholesterol labelled J774 macrophages of apoB depleted sera from healthy individuals and AF patients with and without LVA.

Methods
Patients with AF undergoing catheter ablation (n=95) were free from statins and had no fibrotic heart, kidney, thyroid or liver disease. They were 61.5 ± 11 years old, 46% female and 18% had left atrial LVA. Blood plasma samples were collected from femoral vein before catheter ablation. LVA were determined using high-density maps and were defined as potentials <0.5 mV. Controls (n=29) were 59 ± 13 years old and 31% female. Cholesterol efflux from J774 macrophages which were labeled with [3H]cholesterol was measured following 4h incubation with apoB-depleted proband serum. Radioactivity in supernatants and cells was then measured by liquid scintillation counting and set into relation with total radioactivity in medium and cells.

Results
HDL cholesterol efflux capacity of AF patients was significantly reduced compared to healthy individuals (8.00% ± 0.16 vs 11.00% ± 0.22, p < 0.001). Of particular interest, cholesterol efflux capacity tended to be lower in male AF patients and in patients with LVA compared to patients without LVA.

Conclusion
HDL-function is impaired in patients with atrial fibrillation. The effect depends on gender and AF progression state. Whether this effect is a consequence of AF associated processes like oxidative stress or a primary dysfunction is contributing to AF initiation or progression should be further studied.

Figure 1: HDL-cholesterol efflux capacity of controls and AF patients with and without left atrial low voltage areas.