

Streszczenie w języku angielskim

Atrial fibrillation (AF) is a common arrhythmia that significantly reduces patients' quality of life and significantly shortens life expectancy. Although long-chain fatty acids (LCFAs) are essential energy substrates for myocardial metabolism, their excess can result in lipotoxicity, which increases the risk of arrhythmia. Intracellularly, LCFAs are bound by fatty acid binding proteins (FABPs), resulting in low levels of free LCFAs in the cytoplasm. Based on this principle, FABPs are considered "safeguards" against the toxic accumulation of LCFA. Currently, in relation to cardiovascular diseases heart-type fatty acid binding protein (H-FABP) and adipocyte fatty acid binding protein (A-FABP) play significant roles. H-FABP is already a well-established marker in the early diagnosis of myocardial infarction. In addition, FABPs have been assigned as a potential AF biomarker in patients with de novo diagnosed arrhythmia, chronic heart failure, and in patients undergoing cardiac surgery. In recent years, we have observed the continuous development of transcatheter techniques for isolating pulmonary veins (PVI). Multicenter analyses showed that patients after PVI have significantly reduced mortality, and the number of hospitalizations due to cardiovascular disease and AF relapses compared to patients on classical drug therapy. The superiority of any of the techniques has not been demonstrated, but due to the safety of the procedure, its shorter time and faster reaching the plateau point in the operator's learning curve, cryoablation is becoming more and more popular.

The main aim of the study was the evaluation of H-FABP and A-FABP and LCFA (saturated, unsaturated, monounsaturated, and polyunsaturated) levels in plasma in patients with recurrent, untreatable pharmacological atrial fibrillation measured before and 24 hours after cryoablation, and then comparing them with a group of control healthy volunteers. The goals were also evaluation of the effectiveness of cryoablation in 3 months and 6 months of follow-up depending on the baseline level and change of the concentration of tested fatty acid binding proteins and selected fatty acids. In this study we were looking for the causes of recurrence of arrhythmia, the parameters of the cryoablation procedure (cryoablation time, maximum freezing temperatures, amount of cryoapplication), and characteristic data of the studied group (age, sex, aggravating comorbidities, BMI, physical activity, DHA supplementation, lipid profile).

In 33 patients with AF (EHRA 2B and 3, mean age 60 ± 8.12 years), plasma concentrations of FABP and FA were determined at admission and 24 hours after CBA (ELISA and gas-liquid chromatography, respectively). The control group consisted of 20 healthy volunteers. Af recurrence was assessed at 3 and 6 months by assessing the onset of symptoms associated with arrhythmia (palpitations, chest discomfort, decreased exercise tolerance, and dizziness) and analysis of 12-lead electrocardiogram (ECG) or 24-hour Holter monitoring.

Analyses showed that plasma H-FABP and A-FABP concentrations were significantly higher in patients with AF than in the control group (1134.98 [pg/mL] vs 836.38 [pg/mL] and 34.29 [pg/mL] vs 15.15 [pg/mL], respectively, $p < 0.05$). At 24 hours after cryoablation, there was a significant increase in plasma H-FABP (1574.42 [pg/mL] vs 1134.98 [pg/mL], $p < 0.05$), and no decrease in long-chain FA levels was observed. Atrial fibrillation recurrence in 8 patients (24.25%) at 3 months and in 13 patients (39.4%) at 6 months. Among all the variables analyzed, only oleic acid concentration correlated significantly with a lower rate of AF recurrence in the 6-month follow-up (680.24 ± 189.768 vs. 567.04 ± 70.002 , $p < 0.05$).

Based on the results obtained, the following conclusions were made:

1. Patients with atrial fibrillation have higher concentrations of H-FABP and A-FABP than healthy people.
2. H-FABP concentrations increase significantly after cryoablation of the pulmonary veins.
3. Patients with recurrent atrial fibrillation (both 3 and 6 months after CBA surgery) have lower H-FABP change and lower H-FABP concentrations 24 hours after ablation than patients whose long-term follow-up remained effective.
4. The initial higher concentration of oleic acid statistically significantly affected the effectiveness of cryoablation and the maintenance of sinus rhythm after 6 months of follow-up.
5. No significant associations have been demonstrated between the recurrence of atrial fibrillation and clinical characteristic or procedural parameters.