ARTERIAL STIFFNESS, GALECTIN-3, ALDOSTERONE, TGF-BETA1 AND DIASTOLIC DYSFUNCTION IN PATIENTS WITH ATRIAL FIBRILLATION

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Introduction

Carotid-femoral pulse wave velocity (cfPWV) is a parameter of evaluating arterial stiffness that is associated with increased risk of cardiovascular complications.

Objective

The objective of this study was to compare the arterial stiffness in patients with atrial fibrillation (AFib) and healthy individuals and to identify the relationship between arterial stiffness, diastolic function of left ventricle (DFLV) and levels of galectin-3 (Gal 3), aldosterone (ALDO), transforming growth factor beta1 (TGF-beta1) - substances with profibrogenic effects on cardiovascular system.

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Design and methods

181 persons (105 female and 76 males, 49,8±3,4 years old) were examined and divided into 2 groups: AFib (n=74) and healthy control (n=108). Groups did not differ significantly by gender and age (p>0,05). The examination included: serum Gal-3, ALDO, TGF-beta1 levels (Enzyme Immunoassay) were analyzed. cfPWV was determined by Sphygmocor.

DFLV was measured by ECHO according EACVI/ASE recommendation.

Results:

Also we found that carotid Intima-media thickness was higher in group of AFib compared with healthy control (0,93±0,2 and 0,61±0,2 mm; p<0,001).

cfPWV was higher in group of AFib compared with healthy control (8,3±1,6 and 6,5±0,9 m/s; p<0,001).

Serum Gal-3 in patients with AFib was higher compared with the healthy control (540,2 [480,1;1320,3] and 320,1 [240,2;420,3] pg/ml; p<0,001), ALDO was higher in the AFib (170,0 [112,1;259,8] and 95,5[53,3;136,04] pg/ml; p<0,001), TGF-beta1 was also higher in the AFib (5190,1 [25248,3;17475,2] and 2120,1 [767,2;4435,9] pg/ml; p<0,001).

(r=0,410, p<0,001) and TGF-beta1 (r=0,404, p<0,001) was revealed.

cfPWV was also correlated with volume index of left atrium (iVLA) (r=0,348, p<0,001).

The multivariate regression analysis with included profibrogenic factors and arterial stiffness demonstrated that cfPWV is a parameter influenced on DFLV (beta=0,247, p=0,002). The binomial regression analysis demonstrated that cfPWV is a factor, with increased risk of DFLV (OR=1,46, 95% CI 1,13-1,84, p=0,0014) and an independent predictor of AFib (OR=3,38, 95% CI 2,33-4,91, p < 0,001).

Conclusions

“Gold standart” of arterial stiffness – carotid-femoral pulse wave velocity and levels of galectin-3, aldosterone, and TGF-beta1 were higher in atrial fibrillation patients, than in healthy persons. We propose that profibrogenic substances can induce morphological changes in arterial wall withe can lead to diastolic dysfunction and left atrium enlargement, and increase risk of atrial fibrillation.