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Prognosis of arterial thromboembolic complications in patients with extrasystolic arrhythmia

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Acute Coronary Syndromes – Prevention

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Extrasystolic arrhythmia is not included in the list of arterial thromboembolism risk factors.

Purpose. To determine the influence of different types of extrasystoles on the risk of thromboembolic complications.

Materials and methods. We analyzed the 24-hours ECG monitoring results of 1036 patients with supraventricular and ventricular extrasystoles without atrial fibrillation in anamnesis. All they had multi-focus atherosclerosis of main arteries. Extrasystoles were divided into groups due to the moment of their appearance in cardiocycle:
1. Extrasystoles before the mitral valve opening.
2. Extrasystoles in phase of fast ventricules filling before the peak of transmitral blood flow.
3. Extrasystoles in phase of fast ventricules filling after the peak of transmitral blood flow.
4. Extrasystoles in slow ventricules filling phase.
5. Coupled and group extrasystoles.

We analyzed computer tomography-verified ischemic stroke and system arterial embolism in anamnesis. We analyzed the regular, extraordinary and first post-extrasystolic contractions. The kinetics of vessel wall was calculated by sphygmograms and included: speed, acceleration, power, work. Intra-arterial blood flow was estimated by ultrasound-doppler. The moment of extrasystoles appearance was determined by EchoCG, ECG and 24-hours ECG monitoring. We estimated the risk of thromboembolism within 1 year including: heart failure NYHAII and more, AH, age (under 65, over 65), diabetes mellitus, ischemic stroke or system thromboembolism in anamnesis, hemodynamically important carotid bifurcation (CB) stenosis, heterogenic atheromas of any localization, extrasystoles before and after the peak of transmitral blood flow, group extrasystoles, allorrhythmias, ventricular tachycardia paroxysms. Each parameter got points in accordance to the contribution into the overall thromboembolism risk.

Results. The main contribution into thromboembolism was made by: age over 65, ischemic stroke of system thromboembolism in anamnesis, hemodynamically important CB stenosis, extrasystoles of 1, 2 and 5 types of our classification.

Main importance has the moment of extrasystole appearance in cardio cycle and the ability of the first post-extrasystolic contraction to reestablish an adequate resulting blood flow. It is characterized by: stroke volume rising from 5 to 40%; systolic BP increase up to 36%; rising of arterial walls kinetic parameters; blood flow velocity rising (1,6-2,6 times); grown arterial wall deformation.

Conclusion. Extrasystolic arrhythmia is the risk factor of thromboembolic complications with multifocal atherosclerosis. The source of thromboembolism can be wall thrombus, dissections. The earlier of extrasystole appearance, the higher kinetic parameters of arterial wall and blood flow velocity in first post-extrasystolic contraction.
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