

THE CLINICAL AND ECHOCARDIOGRAPHIC FEATURES OF PATIENTS WITH SINGLE-CHAMBER AND DUAL-CHAMBER PACEMAKERS

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Relevance. The abnormalities in cardiac impulse generation and conduction may emerge at various levels in the cardiac conduction system. Therefore, pacemaker implantation is crucial for a beneficial therapy, mainly for patients with sick-sinus syndrome and atrio-ventricular disorders [1]. Currently, the following types of pacemaker implants such as single-chamber (SC), double-chamber (DC), biventricular, leadless are available. Literature shows gaps in knowledge regarding SC and DC pacemakers mainly on long-term outcomes, despite the superior physiological pacing of DC pacemakers [2].

Target. To examine the clinical and echocardiographic features of patients with SC and DC pacemakers in order to enhance the understanding of long-term outcomes.

Research methods. This single-center retrospective study consisted of 85 patients admitted to the Grodno Regional Clinical Cardiological Center for pacemaker implantation from January 2024 to December 2025. The patients were divided into 2 groups according to the type of pacemaker implanted. Group 1 included 42 patients with SC pacemakers, while Group 2 included 43 patients with DC pacemakers. Exclusion criteria from the study were: acute coronary syndrome, myocarditis, pericarditis, pulmonary embolism, and severe concomitant extracardiac pathology. All patients underwent clinical, laboratory, and instrumental studies, including transthoracic echocardiography. The statistical analysis was performed using the STATISTICA 12.0 software.

Results and their discussion. Patients in SC Group were significantly older, with a median age of 77 years [72; 84] compared to 71.8 years [65.6; 79.5] in DC Group ($p=0.01$). The prevalence of hypertension was high and comparable in both groups ($>90\%$). Prior myocardial infarction was more frequent in SC (23.8%) compared to DC Group (9.3%), approaching statistical significance ($p=0.08$). Second-degree atrioventricular (AV) block was more frequent in DC Group (27.9%) than in Group SC (4.7%, $p=0.006$). Conversely, third-degree AV block was significantly more common in SC Group (57.1%) compared to DR Group (20.9%, $p<0.001$). Paroxysmal AF occurred more often in Group DC (39.5%) than Group SC (11.9%, $p=0.0057$), whereas persistent AF was more prevalent in SC Group (80.9%) versus DC Group (9.3%, $p<0.001$).

Left atrial diameter measured medial to lateral was greater in Group SC (48.1 mm [43; 50]) compared to Group DC (40.8 mm [38; 43.2], $p<0.001$). Left ventricular dimensions and volumes were numerically higher in Group SC but did not

reach statistical significance. Left ventricular ejection fraction tended to be higher in Group DC (59.6% [56.7; 63]) than Group SC (55.4% [51.5; 61.5], $p=0.09$).

Conclusions. SC patients were older, and presented with more persistent AF, advanced AV block, and larger atrial sizes. DC patients predominantly presented with sick sinus syndrome and paroxysmal AF, and better atrial dimensions. These findings highlight the need for personalized pacemaker selection to improve patient management.

LITERATURE

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THE GENETIC PROFILE OF MTHFR A1298C VARIANT IN PATIENTS WITH LOWER-EXTREMITY ARTERIAL DISEASE REQUIRING ENDOVASCULAR THERAPY

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Relevance. The methylenetetrahydrofolate reductase (MTHFR) A1298C polymorphism reduces enzyme activity, weakening homocysteine metabolism and resulting in moderate hyperhomocysteinemia [1]. Elevated homocysteine causes endothelial dysfunction and hastens atherosclerosis, increasing cardiovascular disease risk [2]. Peripheral arterial disease (PAD) may progress to critical limb ischemia, often requiring endovascular revascularization, mainly angioplasty with stenting.

Target. To explore the distribution of the MTHFR A1298C polymorphism in patients with lower-extremity arterial disease undergoing endovascular or hybrid revascularization interventions, and to evaluate the characteristics of atherosclerotic lesions and the types of revascularization procedures performed.

Research methods. This retrospective study included 69 patients (58 males, 11 females) diagnosed with chronic arterial insufficiency per the Fontaine-Pokrovsky classification. Inclusion criteria consist of patients with informed consent who underwent lower-extremity revascularization for atherosclerotic lesions. Patients without chronic arterial insufficiency, without consent, or with multiple interventions were excluded. The distribution of atherosclerotic lesions and MTHFR A1298C genotypes were investigated.