**Kanorskiy S.G. Antiarrhythmic therapy in patients with paroxysmal and persistent atrial fibrillation: prediction and prevention of progression to permanent form of arrhythmia**

International Heart and Vascular Disease Journal. 2014; 4: 3-10

**Summary**

A realistic objective for treatment of patients with paroxysmal and persistent atrial fibrillation (AF) should be to prevent its progression to a permanent form of arrhythmia, which is associated with an increased risk of compli-cations and worsening prognosis. This review presents easily identifiable predictors of AF progression, reviews available treatment options, and their efficacy and safety. Early and active measures to restore and maintain sinus rhythm by pharmacological and non-drug methods will prevent the development of arrhythmia substrate; inhibit the progression from paroxysmal to permanent AF, with potentially beneficial effects on prognosis.

**Keywords**

Atrial fibrillation, progression, treatment

**Güler E., Kızılırmak F., Güler G. B., Kılıçaslan F. Interference of biventricular ICD with radiofrequency application during ventricular tachycardia ablation in a pacemaker-dependent patient**

International Heart and Vascular Disease Journal. 2014; 4: 35-38

**Summary**

Electromagnetic devices may interfere with cardiovascular implantable electronic devices (CIEDs) in the hos-pital and outside. Ablation for the cardiac arrhythmia is increasing, and interference is a serious matter for the pacemaker-dependent patients during ablation procedure.

**Keywords**

Electromagnetic interference, ventricular tachycardia, ablation

**Shilova M.A. Sudden cardiac death in young people: risk factors, causes, morphological equivalents**

International Heart and Vascular Disease Journal. 2015; 6: 21-29

**Resume**

This article reviews the literature on the causes of sudden cardiac death (SCD) in young people. The results of our own retrospective study of deaths of people under 39 years old based on forensic autopsies for 10 years have been presented. The structure and dynamics of the causes of death, risk factors, and the role of pre-existing disease, such as connective tissue dysplasia (CTD), in the development of terminal symptom complex have been studied. It has been found that the main mechanism of SCD in young people is arrhythmogenic, developing in response to such precipitating factors as physical activity, psychoemotional stress, and consumption of low alcohol drinks.

**Keywords**

Pathology of the heart and blood vessels, sudden cardiac death, young age, risk factors, morphological features, connective tissue dysplasia

Sysina O.N., Iskenderov B.G. Comparative assessment of the effectiveness of radiofrequency ablation of pulmonary veins by the patients with persistent atrial fibrillation, effected in the course of coronary artery bypass grafting, depending on the renal function

International Heart and Vascular Disease Journal. 2015; 7: 33-41

**Abstract**

**Aim.** To determine the effectiveness of radiofrequency ablation (RFA) with concomitant Coronary Artery Bypass Grafting (CABG) by the patients with persistent atrial fibrillation (AF) depending on the glomerular filtration rate (GFR).

**Material and methods.** 403 patients (253 males and 150 females) aged from 50 to 67 (average age: 60.5±6.7 years) with persistent AF were examined. The duration of AF before an operation ranged from 1.5 to 8 years and on average 4.7±1.5 years. The initial figures of GFR accounted for from 59 to 45 ml/min/1.73 m2 in 247 patients (the 1st group) and from 89 to 60 ml/min/1.73 m2 in 156 patients (the 2nd group).

**Results.** During inpatient hospital period of CABG it was diagnosed Acute Kidney Injury (AKI) by the132 patients (53.4 %) in the 1st group and by the 35 patients (22.4 %) in the 2nd group. Early recurrences of AF were revealed by 43.3 % of pa-tients in the 1st group and by 23.7 % of patients in the 2nd group (p<0.001). In the 1st group the diagnosis of early recurrences of AF was made significantly more frequently among patients with AKI than among patients without it. 12 months after operation late recurrences of AF without antianginal therapy were revealed by 31.3 % of patients and among them by 37.8 % of patients with AKI in the 1st group; and by 21.2 % and 24.2 % respectively in the 2nd group. The figures of GFR were higher by patients with effective RFA than by patients with ineffective RFA on aver-age at 37.8 % (p = 0.002). It was revealed that GFR directly correlates with an effective refractory period of the left atrium (r = 0.56; p < 0.001) and a frequency threshold for induction of arrhythmia (r = 0.53; p = 0.013). Elimination of paroxysms of AF after RFA procedure was followed by considerable improvement of morpho-functional and electrophysiological parameters of heart.

**Conclusion.** It was shown that the presence of renal dysfunction in patients with persistent AF adversely influences on effec-tiveness of RFA with concomitant CABG and a short- and long-term cardiovascular prognosis.

**Key words**

Renal dysfunction, coronary artery bypass graft surgery, radiofrequency ablation, atrial fibrillation

**Mamedov M.N., Mardanov B.U. Analysis of latest international studis for atrial fibrillation: trends and perspectives**

International Heart and Vascular Disease Journal. 2015; 8: 10-16

**Summary**

The urgency of atrial fibrillation (AF) as the health and social problems, primarily due to the fact that the rhythm of the heart, being a significant cause of heart failure, stroke and other thromboembolic complications, signifi-cantly increases the relative risk of total and cardiovascular mortality. In addition, complications of AF are the cause of persistent disability of working age. All this leads to the continuation of a number of randomized studies examining the effectiveness of various methods to control the heart rhythm and heart rate, as well as improving the prognosis of the disease. In this article the provisions concerning drug and non-drug treatment of diseases, subject to revision in the latest national and international guidelines.

**Keywords**

Atrial fibrillation, recommendations, anticoagulants, antiarrhythmic drugs, ablation

# **Abdelshafy M, Torky A, Farid A. The relationship between total epicardial fat volume and atrial fibrillation**

# International Heart and Vascular Disease Journal. 2016; 9: 13-20

# **Abstract**

**Background.** Obesity is an important risk factor for atrial fibrillation (AF). Local epicardial fat enclosed by the visceral pericar-dial sac has been hypothesized to exert local pathogenic effects on cardiac structures. We aimed to characterize the relationship between total epicardial fat volume assessed by non contrast cardiac CT and AF.

**Methods.** This case control study conducted from May 2013 to December 2014 in cardiology and radiology departments of Benha University Hospitals. Fifty patients with a history of AF were taken up plus control group of 50 reference patients without history of AF. All patients underwent cardiac CT imaging to measure total epicardial fat volume (EFV), together with systemic obesity indices as body mass index (BMI), waist circumference and body weight plus echocardiographic parameters as left atrium (LA) volume index, left ventricular ejection fraction. All these were examined in relation to the presence and chronicity of AF.

**Results.** EFV was significantly associated with the presence of AF (p values<0.05).Significant positive correlation between EFV and AF chronicity was denoted. Patients with persistent AF had significantly larger EFV versus patients with paroxysmal AF (p value = 0.002). EFV was positively correlated with LA volume index (r = +0.45, p<0.001) Multivariate logistic regression model for AF risk factors revealed that EFV was the strongest independent risk factor for AF with highest odds ratio (2.13,95%CI: 1.01 to 3.06) followed by odds ratio (1.81,1.55 and 0.8) for LA volume index, waist circumference and BMI respectively.

**Conclusion.** Epicardial fat is associated with the presence of AF and predicts chronicity. These associations are independent to systemic measures of adiposity and sensitive echocardigraphic parameters as LA volume index. These findings are consistent with the hypothesis of a local pathogenic effect of epicardial fat on the arrhythmogenic substrate supporting AF

**Key words**

Atrial fibrillation, cardiac CT imaging, obesity, epicardial fat

# **Grinstein Yu.I., Shabalin V.V. A case of Gitelman’s syndrome with severe hypokalemia and pseudoischemic ECG changes**

# International Heart and Vascular Disease Journal. 2016; 9: 36-41

# **Summary**

A case of Gitelman’s syndrome with severe hypokalemia and pseudoischemic ECG changes is presented. A brief review on this kind of primary tubulopathy is also given. Clinical significance of possible difficulties for cardi-ologist is indicated (pseudoischemic ECG changes, QT-interval prolongation with life-threatening ventricular arrhythmias, risk of myopathy and rabdomyolisis development after statin administration, hypokalemia worsening due to prescribing diuretics).

**Key words**

Gitelman syndrome, hypokalemia, tubulopathy

**Striuk R.I., Shoikiemova J.U., Borisov I.V. Pregnancy as the risk factor of arrhythmias**

International Heart and Vascular Disease Journal. 2016; 10: 3-8

**Summary**

**Objective**. To investigate thefeatures of arrhythmias and define possible etiological factors of their development in pregnantwomen.

**Materials and methods.** 133 patients (average age 27,1±5,7 years) during II-III trimesters of pregnancy were investigated, 113 of them had complex arrhythmias, 20 women had normal sinus rhythm. Depending on presence or absence of arrhythmia andcardiovascular pathology all patients were divided into three groups. Group I (n=62) included women with arrhythmias and organic lesions of cardiovascular system: congenial or acquired heart disease, cardiomyopathies, post-myocarditis cardiosclerosis. Group II (n=51) included patients with idiopathic arrhythmias, control group (n=20) included almost healthy women with normal sinus rhythm.

**Results.** According with 24 hour ECG monitoring, arrhythmias of III-IV classes (classification of Lown B. и Wolff N., 1971) were registered with the same frequency in both groups of patients. At the same time maximal number of ventricular extrasystoles was detected in the group of “idiopathic” heart rhythm lesions and the biggest number ofsupraventricular extrasystoles was found in the Group I of patients. Pregnant women with mitral valve prolapsehad significantly lower frequency of supraventricular extrasystoles, but at the same time the occurrence of ventricular extrasystoles was comparable with main observation groups.

**Conclusion.** Complex arrhythmiasarise both in pregnant women with concomitant cardiovascular pathology and in womenwithout organic lesions of organs and metabolic processes. It requires precise dynamic observation of thesepatients.

**Key words**

Arrythmias, pregnancy, cardiovascular disease, idiopathic arrhythmia

**Olesin A.I., Litvinenko V.A., Shlapakova A.V., Konstantinova I.V. Estimation of atrial fibrillation risk development in patients with metabolic syndrome during atrial extrasystole registration**

International Heart and Vascular Disease Journal. 2016; 11: 17-27

**Summary**

**Objective.** To estimateatrial fibrillation (AF) risk development in order to determine its long-term and short-term develop-ment risks in patients with metabolic syndrome (MS) during atrial extrasystole (AE) registration according withperformed prospective study.

**Materials and methods.** 1427 patients of the age between 45 and 75 years with MS and registered AE were observed from 1998 to 2012. Apart of general examination, patients underwent hemodynamic monitoring, atrial late potential (ALP) and P-wavedispersion (Pd) measurement and estimation of AE character with quantification of AF development risk index (AFDRI). After inclusion into the study patients were observed during the period from 1 to 4-5 years. Presence orabsence of AF development during the period of observation was considered the endpoint of this study.

**Results.** 156 (10,93%) of examined patients developed paroxysmal or persistent form of AF during 4–4.5 years of prospective observation. Atrial dilatation and/or ALP detection after single examination in patients above 55 years withMS determine long-term risk of AF development. Short-term risk (during 1–2 years after the first examination) ofAF development can be estimated just after dynamic observation of patients: AFDRI reduction to 35% and moreduring each 3–4 month of observation comparing with initial results determines AF development in patients withMS during 1–2 years, and if AFDRI levels are less than 0,5 units with subsequent reduction to 70% and more each1–3 months, it determines AF development during 6 months after examination.

**Conclusions.** Complex examination of MS patients that includes ALP and Pd measurement and AFDRI estimation allows to determine both long-term and short-term risks of AF development.

**Keywords**

Atrial fibrillation, metabolic syndrome, development risk identification

**Mikhin V.P., Shveynov A.I., Kharchenko A.V. Impact of omega-3 polyunsaturated fatty acids on arrhythmic activity of myocardium and characteristics of cardiac rhythm in patients with unstable angina.**

International Heart and Vascular Disease Journal. 2017; 15: 9-13

**Summary**

**Objective.** To evaluate the impact of omega-3 polyunsaturated fatty acids (PUSFA) on myocardial arrhythmic activity and characteristics of cardiac rhythm variability in patients with unstable angina

**Materials and methods.** We’ve conducted an open randomized trial that involved 41 patients aged 45-70 years and diagnosed with coronary heart disease (CHD): unstable angina. All patients underwent standard complex therapy. Patients were subdi- vided into two groups: omega-3 PUSFA supplement (1g/day) was added to the therapy in the first (main) group, whereas the patients of the second (control) group received standard therapy. Patients underwent 24-h electro- cardiogram (ECG) monitoring with estimation of ventricular and supraventricular extrasystolic activity and main characteristics of cardiac rhythm variability on the 3rd and 14th days of treatment.

**Results.** Estimation of supraventricular activity during 24 hours revealed significant reduction of the number of extrasysto- les both in the main and control groups (reduction from 40.5 (21.8-122.5) to 29.5 (6-68.3) in the main group (p<0.01) and reduction from 10 (0-18) to 7.5 (3.8-56.3) in the control group (p<0.05). Differences between groups were statistically significant. In the main group the number of ventricular extrasystoles reduced significantly from 7.5 (1.8-31.8) to 1 (0-18.8), p<0.05. Comparison of cardiac rhythm variability parameters revealed significant increase of SDNN (by 38% and 28.7% in main and control groups, respectively, p<0.01) and HF in both groups (p<0.05), pNN50 and VLF in the main group by 41.4% and 21.5%, respectively (p<0.01, p<0.05).

**Conclusion.** Addition of omega-3 PUSFA (1g/day) supplement to the complex therapy of patients with unstable angina leads to reduction of ventricular arrhythmic activity and increases total reserve of neurohumoral regulation.

**Key words**

Omega-3 polyunsaturated fatty acids, unstable angina, arrhythmic activity, cardiac rhythm variability.

**Popova E.P.**

**Comparison of the effects of I class antiarrythmics Ethmozine, Ethacizin on spectral characteristics of cardiac rhythm variability in rats.**

International Heart and Vascular Disease Journal. 2018; 17: 36-41

**Objective.** To investigate the change of spectral characteristics of heart rate variability of outbreed male rats under the influence of Class I antiarrhythmic drugs Ethmozine and Ethacizin.

**Materials and methods.** Heart rate variability was estimated using the method of spectral analysis assessed with the «Astrocard» equipment (Russia).

**Results.** We demonstrated that Ethmozine administration decreased the percentage of very low frequency (VLF) and increased the proportion of low (LF) and high (HF) frequency waves by 33 % and 37 %, respectively. Ethacizin decreased the total spectral power by 81 % and consequently led to reduction of all spectral parts’ amplitude: VLF, LF, HF oscillations were reduced by 83 %, 73 % and 87 %, respectively. Analysis of spectral structure revealed the decrease of HF oscillations number by 37 % and the increase of LF oscillations number by 17 %.

**Conclusions.** Ethmozine increased the role of vegetative nervous system in cardiac rhythm regulation versus humoral factors without changing the interrelation between sympathetic and parasympathetic influences. Ethacizin decreased cardiac rhythm variability in our animal model, when ethmozine did not change heart rhythm variability. Ethacizin increased the influence of sympathetic nervous system on myocardium.

**Key words**

Variability of heart rate, class I ahtiarrhythmics, drug of class I, Ethmozine, Ethacizin***.***

**V.S. Petrov. The effect of permanent atrial fibrillation on the course of rheumatic heart disease.**

International Heart and Vascular Disease Journal.2019; 22: 17-22

**Objective.** To evaluate the effect of permanent AF on the course and manifestation of CHF in patients with rheu- matic heart disease (RHD).

Materials and methods. We examined 167 patients with RHD: 84 (50,3 %) with AF and 83 (49,7 %) with (SR). The groups differed by age (p = 0,001): 55,89±0,79 years (SR) and 61,48 ± 0,081 years (AF). The follow-up was 5 years. Echocardiography was performed using Philips Affinity 50 ultrasound machine, 24-hour ECG monitoring using

«Cardiotechnika-04–3P (M)» monitor, pulmonary function testing using Spirolab II. The assessment of the quality of life was determined using the SF-36, KCCQ, MHFLQ questionnaire.

**Results.** Patties from AF group initially had lower SMo (by 0,22 cm2) and 6-minute walk test distance (by 31.11 meters) compared with patients from SR group. During echocardiography patients from AF group had higher atria and right ventricle linear dimensions and tricuspid valve pressure. Pulmonary function testing values were lower in patients from AF group compared with SR group: FVC by 11,35 %, FEV1 by 11,35 % and VC by 22.9 %. The quality of life did not differ according to the KCCQ, SF-36, MHFLQ questionnaires. During 5-year follow-up echo- cardiography, pulmonary function testing, and quality of life parameters did not change significantly in patients from SR group. Patients from AF group had SMo decrease by 0,18 cm2, LVES increase by 0,19 cm, right ventricle dimension — by 0,23 cm and left atrium — by 0,35 cm. 6-minute walk test distance decreased by 21,48 meters. The changes may be explained by higher resting heart rate in patients with AF — by 6 beats per minute on average.

**Conclusion.** Permanent AF in patients with RHD affects echocardiographic parameters- dilatation of the heart cavities and progression of mitral stenosis, and decrease the distance of the 6-minute walk test. Pulmonary func- tion testing values and quality of life were not affected during the 5-year follow-up.

**Keywords**

Rheumatic heart disease, atrial fibrillation, mitral stenosis.

**A.I. Olesin, V. A. Litvinenko, A.V. Shalapakova, I.V. Konstantinova, Yu.S. Zueva. Antiarrhythmic drug therapy possibilities for primary prevention of atrial fibrillation in patients with metabolic syndrome and premature atrial contractions: a prospective study.**

International Heart and Vascular Disease Journal.2019; 22: 22-28.

**Objective.** To estimate antiarrhythmic drug therapy possibilities for primary prevention of atrial fibrillation (AF) in patients with high risk of AF, metabolic syndrome (MS) and premature atrial contractions (PACs).

**Materials and methods.** We followed-up 305 patients aged 59 to 73 years with MS and high risk of AF develop- ment without the history AF. 156 (51, 15 %) patients received basic therapy including correction of

modified risk factors (control group), other patients received classes I –III of antiarrhythmic agents for primary prevention of AF. Every patient who was included in the trial was followed-up from 2 to 4–5 years: the endpoint was the absence or presence of AF.

**Results.** Patients with MS and PACs with high risk of AF who received classes I –III of antiarrhythmic agents had AF three times less frequent compared with control group (31,54 % versus 95,51 % during antiarrhythmic and basic therapy, respectively). Positive effect of antiarrhythmic therapy for primary prevention of AF in patients with MS can be explained by the reduction or elimination of PACs, left ventricular dysfunction and signal-averaged ECG parameters improvement, P-wave dispersion and left atrial volume reduction.

**Conclusion.** The frequency of this arrythmia development reduced by three times on average during classes I – III of antiarrhythmic treatment for primary prevention of AF in patients with high risk of AF, MS and PACs.

**Key words**

Metabolic syndrome, primary prevention of AF.

# **Iskenderov B.G., Lokhina T.V., Berenshtein N.V.**

# **Safety of using medical and diagnostic procedures that cause electromagnetic interference in patients with implanted pacemakers.**

# International Journal of Heart and Vascular Diseases. 2020; 8 (27): 50-59

# **Summary**

The number of patients with implanted pacemakers is steadily rising throughout the world. At the same time, a great variety of modern medical procedures that are routinely used in clinical practice can potentially cause changes in pacemaker settings and even lead to the total dysfunction of the device, which can also be referred to as electromagnetic interference (EMI). Therefore, specific therapeutic and diagnostic methods should be used rationally in patients with pacemakers and potential EMI must be considered. In the current review we discuss EMI causes, types of pacemaker malfunction and possible precautions, and the need of pacemaker settings control and correction after the procedures. Magnetic Resonance Imaging (MRI), therapeutic radiation, catheter radiofrequency ablation and some types of physiotherapy are thoroughly analyzed. We also discuss the importance of avoiding the irrational use of procedures that can be potentially dangerous for patients with implanted pacemakers.

**Keywords**

Pacemaker, electrical stimulation of the heart, electromagnetic interference, physiotherapy

**Olesin A.I., Konstantinova I.V., Zueva Yu.S., Sokolova M.D.**

**Ventricular extrasystoles in patients without cardiac structural changes: mechanisms of development, arrhythmogenic cardiomyopathy predictors, pharmacological and nonpharmacological treatment strategies.**

International Heart and Vascular Disease Journal. 2020; 8 (26):21-30

**Summary**

The review article presents critical analysis of clinical studies over the last years, dedicated to ventricular extrasystoles (VEs) detection in practically health individuals, i. e. patients without cardiac structural changes. The development of frequent premature ventricular contractions can induce left ventricular (LV) dysfunction and lead to the formation of arrhythmogenic cardiomyopathy. Therefore, the objective of this article is to determine, based on the analysis of literature and research data, the main mechanisms of VEs development in patients without cardiac structural changes, predictors of LV dysfunction and arrhythmogenic cardiomyopathy induced by premature ventricular complexes, and to evaluate the effectiveness of pharmacological and interventional antiarrhythmic therapy. The analysis will show the direction of future clinical studies to improve VEs treatment in patients without cardiac structural changes.

**Key words**

Ventricular extrasystoles in patients without cardiac structural changes, arrhythmogenic cardiomyopathy prevention principles.