Late ventricular potentials in risk assessment of the occurrence of complex ventricular arrhythmia in patients with myocardial infarction and heart failure

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Aim. To determine the prognostic significance of late ventricular potentials on signal-averaged electrocardiogram and left ventricular ejection fraction for the occurrence of complex ventricular arrhythmia in patients treated with accelerated tissue-type plasminogen activator, using the rapid protocol, within six months of acute myocardial infarction. Methods. In this analytic observational prospective study patients were divided into four groups: patients with left ventricular ejection fraction below 40% and late ventricular potentials; patients with left ventricular ejection fraction below 40% and without late ventricular potentials; patients with left ventricular ejection fraction over 40% and late ventricular potentials; and patients with left ventricular ejection fraction over 40% and without late ventricular potentials. Complex ventricular arrhythmias (Lown grade IVa, IVb, and V) were recorded using standard electrocardiography and 24-hour Holter monitoring 21, 60, and 90 days after acute myocardial infarction, respectively. Serial recordings of signal-averaged electrocardiogram were obtained 30, 90, and 180 days after acute myocardial infarction. Left ventricular ejection fraction was determined by echocardiography between 15 and 21 days after acute myocardial infarction. Multivariate logistic regression analysis was used to evaluate the relation between late ventricular potentials and left ventricular ejection fraction with the occurrence of complex ventricular arrhythmias. Sensitivity, specificity, positive and negative predictive values of late ventricular potentials and left ventricular ejection fraction for the occurrence of complex ventricular arrhythmias were determined. Results. The prospective study included 80 patients (73% men), mean age 64 ± 3.5 years. Complex ventricular arrhythmias were recorded in 34 (42.5%) of patients, all 17 (50%) of which were from the first group (p<0.01). Complex ventricular arrhythmias were recorded in 25 (73.3%) patients with late ventricular potentials, and in 23 (67.6%) patients with left ventricular ejection fraction below 40%. Left ventricular ejection fraction below 40% and late ventricular potentials represented independent predictors for the occurrence of complex ventricular arrhythmias (RR=14.33, p<0.01). When combined with left ventricular ejection fraction below 40%, late ventricular potentials had sensitivity (0.50), specificity (0.93), and positive predictive accuracy (0.85) higher than late ventricular potentials alone (0.44, 0.67, and 0.37, respectively) for the occurrence of complex ventricular arrhythmias following acute myocardial infarction. Conclusion. In this study, late ventricular potentials in patients with left ventricular ejection fraction below 40% represented the independent predictor for the occurrence of complex ventricular arrhythmias in the first six months after the first myocardial infarction treated with accelerated tissue-type plasminogen activator, using the rapid protocol.

Keywords: myocardial infarction; electrocardiography; stroke volume; arrhythmia; ventricular function, left; tissue plasminogen activator; prognosis.

Introduction

Mortality of patients within the first year of acute myocardial infarction (MI) was 10–20% if not treated with fibrinolytic therapy, while 75% of patients died of complex ventricular arrhythmia (CVA) (1, 2). Mortality of patients treated with fibrinolytic therapy within two years after MI was 5–7%, 40% of which due to CVA (3). Two-year mortality of 15% occurred in the patients with left ventricular ejection fraction (LVEF) below 40%, while 50% died consequently of CVA (4). Within the first six months after MI a large number of patients died of heart rhythm disturbance and sudden cardiac death (SCD) (5, 6). Cumulative death incidence due to arrhythmia in high-risk patients within the first year after MI was about 5%, and in cases with sustained ventricular tachycardia (VT) death incidence within the first three months was even up to 40% (7, 8). Stratification of patients after MI with reference to arrhythmia risk is an important integral part of modern clinical cardiology, although not yet precisely defined (9). Stratification of the patients according to arrhythmia risk based only on the frequency and complexity evaluation of ventricular extrasystole (VES) detected by Holter electrocardiography (ECG), with left ventricular dysfunction indicators, was not completely confirmed as efficient in large clinical trials. Namely, in Cardiac Arrhythmia Suppression Trial (CAST) I and II with medicament suppression of VES, death rate increase was registered as a result of cardiac and arrhythmic causes. According to European Myocardial Infarct Amiodarone Trial (EMIAT) and Canadian Amiodarone MI Arrhythmia Trial (CAMIAT) studies, application of Amiodarone in patients with reduced LVEF regardless of VES presence, resulted in the decrease of death rates from arrhythmia, with no influence on the cardiac death (10, 11).

In the previous years, the aim of more precise risk stratification of patients after MI was based on the evaluation of spontaneous arrhythmia (Holter monitoring), transitional factors (heart rate variation – HRV, baroreflex sensitivity, T waves alternans) and the presence of electrophysiological substrate (electrophysiological testing, electrocardiography of average QRS signals – Signal Average Electrocardiography - SAECG), QT dispersion, and left ventricular ejection fraction – LVEF) (12). Low specificity and positive predictive value (PPV) for identification of patients with arrhythmia death risk are restricting factors for independent implementation of these methods, especially in the era of use of fibrinolytic therapy in MI, which resulted in reduced mortality. Efforts were undertaken to overcome this problem by combining noninvasive methods that reveal a different pathophysiological substrate with reference to arrhythmia occurrence, although PPV with preserved sensitivity was rarely over 40% (13, 14). According to recently published results of Multicenter Automatic Defibrillator Implementation Trial II (MADIT II) study, primary prophylactic implantation of implantable cardioverter defibrillator (ICD) in 1 322 patients after MI with LVEF <30% resulted in total mortality reduction in 31% of patients for a three-year observation period (15, 16). In spite of the results of such noninvasive methods, it was necessary to determine more precisely which group of patients after MI would have the highest risk of SCD and would maximally benefit from ICD therapy. LVEF determined by transthoracic echocardiography was extremely important for the occurrence of complex ventricular arrhythmia after MI. Complex ventricular rhythm disorder would lead to hemodynamic compromise and SCD in patients with heart failure after MI, rather than in patients with preserved heart function. In the Antiarrhythmic Versus Implantable Defibrillators (AVID) study, in 3 559 patients with sustained VT in acute MI phase, among 36 tested variables, the age of patients and LVEF were the most significant prognostic factors (17). Bigger et al. (18), demonstrated that mortality of patients with LVEF was lower than 40%, 15% in a two-year period after MI, where the arrhythmia component was present in about 50% of cases. Stevenson et al. (19), demonstrated that mortality of patients after MI with LVEF below 40% was 20% within the course of the first 3.5 years, while sudden death occurred in 50% of the cases. After MI, patients with LVEF less than 30% had three times higher risk of sudden death and arrhythmic events on average (1, 20, 21), than those with preserved LVEF. For death prediction after MI, LVEF below 35% had a sensitivity of 40%, specificity of 14%, and PPV of only 14% (22), and therefore LVEF was usually combined with other risk factors.

Ischemia or myocardial necrosis and permeation of myocytes with scar tissue provoked their delayed activation and slower impulse transfer in that region, which was essential condition for the occurrence of reentry arrhythmia (23). Delayed impulse propagation was the substrate of late ventricular potentials (LVP) that were noninvasively detected on the surface of the body by signal-averaged electrocardiography (SAECG). LVP were the signals in micro-voltage range with reference to QRS complex, which occurred at the end of the QRS complex and extended to the ST segment. The highest LVP frequency was registered in the first week after MI and slowly decreased afterwards. In three weeks the frequency was 50% and in 5 years 25%. The LVP frequency was lower in patients treated with fibrinolytic therapy (24). The LVP had high negative predictive value (96–99%) for the occurrence of CVA, while relatively low PPV (7–29%) limited their applicability as the only test in the diagnosis of CVA (14). The results of the prospective studies showed that the combination of the LVP with other risk determinants (degree of left ventricular dysfunction, complex VES, HRV, and response to programmed ventricular stimulation) was a key step by which a PPV for sustained VT was achieved in up to 50% of cases.

According to the literature on noninvasive identification of patients with a high risk of sudden cardiac death, the following hypothesis was set: there was a correlation between late ventricular potentials and left ventricular dysfunction with the occurrence of complex ventricular ar-
rhythmias in patients within six months after the first myocardial infarction with ST elevation.

Methods

An analytical observational study was designed during prospective observation of patients within the first six months after the first MI with ST elevation and with the registered occurrence of CVA as an outcome.

The study included both male and female patients up to 70 years, with the first MI with ST elevation, all with necrosis, treated with tissue-type plasminogen activator, using the rapid protocol (25).

The study did not include patients with ECG showing disturbances in forming and conducting electric impulses, transthoracic echocardiographic analysis of inherent and acquired heart disorders, nor the patients with primary cardiomyopathy, or other acute illnesses and diagnosed previous myocardial infarction.

Patients with mechanical MI complications, that were the consequence of reperfusion therapy, development of new MI, new conduction disturbances of electrical impulses, new disturbances of supraventricular heart rhythm, and patients with newly occurred acute illnesses were excluded from the study. Four groups of patients were formed. In the first group there were patients with LVEF below 40% and LVP, in the second group patients with LVEF below 40% and without LVP, in the third group patients with LVEF over 40% and LVP, and in the fourth group there were patients with LVEF over 40% and without LVP.

The occurrence of LVP was registered in 30 days, and 3, and 6 months, respectively after MI with ST elevation, by high resolution ECG (SAEGG) with HP Page writer XL Signal-Averaged ECG. The presence of LVP was defined by at least two of the following parameters: duration of filtered QRS complex over 114 ms, root-mean-square voltage of the last 40 ms of vector magnitude of QRS complex below 20μV and low-amplitude (below 40 μV) signal duration over 38 ms.

LVEF was determined by transthoracic echocardiography using modified Simpson's method between 15th and 21st day after the occurrence of MI with ST elevation, in combination with other components of a standard echocardiographic examination.

Complex ventricular arrhythmias were defined as rhythm disturbances, graded according to Lown into groups I and A, 1b, and V (26). CVA was detected by standard ECG and by 24-hour Holter ECG monitoring in the third week, third month, and sixth month after MI with ST elevation.

Data were tested using statistics program SPSS 10.0. LVEF, LVP, and CVA was measured by nominal dichotomous scale. In the range of analytical statistics, methods for the assessment of significance of differences were applied by Mann-Whitney U test and Hi-square test. Logistic regression analysis and forward Wald multiple regression analysis were performed to evaluate correlations and dependency between variables, respectively. The determination of sensitivity and specificity, as well as positive and negative predictive values of LVEF and LVP with reference to the occurrence of CVA was performed.

Results

The study included 80 patients. In the first group, there were 20, in the second group 19, in the third group 20, and in the fourth group 21 patients. The average age was 64 ± 3.5 years, and 59 (73%) of the patients were male. Out of the total number of treated patients 47 (58%) were smokers, and 15 patients (18.7%) were with diabetes. There was no statistically significant difference between formed groups regarding age, gender, smoking and diabetes.

Complex ventricular arrhythmias CVA were registered in 34 (42.5%) cases, compared to the total number of patients. Within the first group of patients CVA was registered in 17 (50%) cases, in the second group 1 of 6 (17%), in the third group in 8 (23%), and in the fourth group in 3 (8.8%) cases. Among the observed groups of patients, statistically significant difference in CVA (p<0.01) occurrence was noted. In the first group significantly larger CVA number (p<0.01) was registered, compared to the other groups and in the fourth group significantly smaller CVA number was registered compared to other groups of patients (p<0.01).

In 40 patients, whose LVP was registered during the observed period, CVA was registered in 25 cases (73.5%), while in 31 (67.4%) patients without LVP, CVA was not registered. A significantly larger CVA number (p<0.01) was registered comparing patients without LVP with those with LVP.

Patients with CVA were registered in the group of patients with LVEF less than 40% 23 (67.6%), and in the group with EF over 40% there were 30 (65.2%) patients without CVA. In patients with EF<40%, significantly higher incidence of CVA was registered, compared to the patients with EF>40% (p<0.01). Univariate predictors of CVA occurrence were LVEF<40% relative risk – RR 3.92, CI 1.53–10.04), which explained 66.25% variability of dependent variable, and LVP occurrence (RR 5.74, CI 2.15–15.29), which explained 70% variability of CVA occurrence. The most significant univariate predictor of CVA was simultaneous occurrence of LVEF<40% and LVP with RR 14.3 (CI 3.71–55.25). Relative risk for CVA occurrence in patients of the fourth group was 0.15 (CI 0.04–0.57), which was highly significant (p<0.001) and explained the resulting variable variety of 61%.

Direct comparison of LVP with LVEF in multivariate regression analysis showed that both variables remained independent predictors of CVA, although the occurrence of LVP had higher relative risk 7.22 (2.42–21.63) than LVEF RR 5.14 (1.73–15.27). Including all independent variables from univariate regression analysis into multivariate regression analysis the only independent predictors of the com-
plex ventricular arrhythmias occurrence were LVP and LVEF below 40% registered in the same patient with RR 14.33 (3.72-55.27), which explained 75% variability of the resulting variable.

The occurrence of LVP with reference to LVEF had lower sensitivity (0.44 vs. 0.67) and PPV (0.37 vs. 0.59) and a higher specificity (0.67 vs. 0.65) and NPV (0.78 vs. 0.73) for the occurrence of CVA. However, LVEF value less than 40% in patients with LVP compared to LVP alone presence improved sensitivity (0.50), specificity (0.93), and PPV (0.85) for the occurrence of CVA (Table 1).

Discussion

Arrhythmia caused death in 75% of patients with MI who hadn’t been treated with fibrinolytic therapy (1). The risk of sudden cardiac death in patients after MI who were not treated with fibrinolytic therapy was 6–10%, and mortality rate was highest within the first six months (6). Studies of patients with MI treated with fibrinolytic therapy demonstrated decreasing incidence of CVA, namely VT was registered in 2.5% of the patients, ventricular fibrillation in 0.5%, cardiac death in 5%, and arrhythmic death in

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Probability of the CVA occurrence was reduced with the increment of the LVEF in patients with and without LVP. However, the probability of CVA occurrence in patients with LVEF 15% and LVP was 98%, but without LVP was 81%, while in patients with LVEF 50% and LVP the same probability was 19% and without LVP it was 4% (Fig. 1 and Fig. 2).

Probability of the CVA occurrence in patients with LVEF<40% and with LVP was 80% and in patients with LVEF>40% and without registered LVP the same probability was 10% (Fig. 3).

2% of the patients within 2.5 years after myocardial infarction (19). However, the risk of SCD was higher (40–80%) in patients with high probability for the occurrence of complex ventricular rhythm disturbances after MI. In such patients it was important to assess properly the function of the left ventricle and the degree of electric instability as a possible death cause, using noninvasive methods (19). Late

Fig. 1 – Complex ventricular arrhythmia (CVA) occurrence probability distribution in patients with positive late ventricular potential (LVP) compared to different left ventricular ejection fraction.
Most of the patients with LVP after MI would not develop complex rhythm disturbances. However, such type of complications could be expected in less than 5% of patients with normal SAECG finding (26). Meta-analysis of the large prospective studies that registered LVP in patients after MI who were not treated with fibrinolytic therapy demonstrated recorded LVP, showing a six time higher risk of sustained VT or SCD occurrence independently of LVEF (2). However, Coronary Artery Bypass Graft Patch Trial (CABG - patch) study of 900 patients with coronary heart disease, LVP and LVEF below 35%, proved that implantation of cardioverter defibrillator as an antiarrhythmic device did not reduce mortality (28), while the results of MADIT II study were in favor of the attitude that after MI, ICD reduced mortality in patients with EF<30%. Considering these studies, findings of LVP as a risk factor for the occurrence of complex arrhythmias and death required an answer.

Most of the studies that assessed LVP predictive significance were performed in the prefibrinolytic era.

In prospective study with 303 patients after MI (54% treated with fibrinolytic therapy), Pedretti et al. (29) found that of the total number of patients with LVP complex arrhythmia occurred only in 16% of cases, while in patients without LVP, 97% did not develop these rhythm disturbances with a sensitivity of 63% and specificity of 77%. Fibrinolytic therapy of MI enabled the patency of infarction artery to a larger extent and thus survival, while LVP recording become more rare. When an infarction artery was closed, LVP could be found in 25–65% patients and when it was open in 6–34% patients, but with three times smaller PPV (1). Pedretti et al. (30), reported that fibrinolytic therapy in the treatment of acute MI cases reduced frequency of LVP recording for 37%, with the reduction of their predictive value. Zimmerman et al. prospectively observed 223 patients after MI (23% treated with fibrinolytic therapy) and quoted that LVP recording had sensitivity of 67% and specificity of 80% for arrhythmic events, negative predictive value (NPV) of 16%, and PPV of 98% (31). By observing 301 patients with LVP after MI (2/3 treated by fi-
brinolitic therapy), Clements et al. (29), separated LVP and LVEF as independent risk factors for prognosis; in the course of a year they registered sustained VT or SCD in 4.3% of patients, with LVP sensitivity of 64%, specificity of 81%, NPV of 98%, but with a low PPV. Farell et. al. (33), observed 416 patients on the average of 610 days after MI, of whom 48% was treated by fibrinolitic therapy. Of all performed noninvasive tests (SAECG, HRV, Holter ECG monitoring and LVEF in multivariable analysis, the authors separated LVP and HRV as independent arrhythmic events predictors, while LVP alone in arrhythmic events had sensitivity 63%, specificity 81%, PPV 17%, and NPV 81%. It wasn't still clear, however, whether the reduced LVP finding frequency after successful fibrinolitic therapy for MI, meant the reduction or preservation of predictive value for the occurrence of arrhythmic events.

According to the results of larger number of studies, LVP could be detected in 39–93% of patients after MI that developed sustained VT and SCD, while less than 5% of patients with normal SAECG findings developed CVA. Low PPV of LVP contributed to the necessity of their combination with other noninvasive tests, with the aim of a more precise identification of patients who developed potentially fatal cardiac dysrhythmia. Thus, in combination of results of SAECG, LVEF, frequency and complexity of ventricular extrasystoles, HRV, or electrophysiologic testing, because of their separate low positive predictive value, the highest PPV even up to 50% was obtained. Regarding MI treated with fibrinolitic therapy it remained unclear which combination of noninvasive diagnostic tests provided the most correct SCD prediction.

A large number of clinical studies evaluated the prognostic value of combination of different noninvasive tests with reference to the occurrence of arrhythmic events (34, 35). El-Sherif at al. (34) stated that only 7% of patients after MI with LVP who did not develop a complex disorder of ventricular rhythm, had LVEF over 40%. In the study by Kuchar et al. (35) in combination of LVP and low LVEF, sensitivity for arrhythmic events was 80%, specificity 89%, and positive predictive value 34%. Gomes et al.(36) and El-Sherif et al. (34) quoted very similar results in the combination of SAECG, LVEF, and CVA findings on Holter ECG monitoring, with the obtained sensitivity of 100%, specificity of 94%, and PPV of 50%.

Thus, the percentage of undesirable arrhythmic events in patients who had abnormal results on SAECG and low LVEF or on SAECG and Holter ECG monitoring was similar and ranging between 31% and 39%, and in patients with normal results 0–1% (36, 37). In combination of low LVEF values with the presence of VT PPV of 47% was obtained for cardiac death and 12% for sudden death, PPV of 36% and 17%, respectively was obtained for late potentials and low LVEF, and LVP in combination with asymptomatic VT had PPV of 27% for SCD (7).

Our investigation included 80 patients prospectively observed within 6 months after the first MI with ST elevation, registering the occurrence of CVA as an outcome. Basic clinical characteristics of patients were not statistically different among the observed groups. Compared to the total number of the observed patients, CVA was registered in 34 cases (42.5%).

The results of this study were in favor of the importance of LVEF below 40% for CVA occurrence. In the group of patients with LVEF below 40%, 23 (67.6%) patients with CVA were registered, which was highly significantly larger number, compared to patients with LVEF over 40% (p<0.01). The importance of LVP for CVA occurrence was illustrated by the results that 25 (73.5%) of patients with LVP registered had CVA. With reference to the patients without LVP, in those with LVP a highly significant larger CVA number (p<0.01) was registered.

Among the observed groups of patients, highly significant difference in CVA occurrence (p<0.01) was registered. Among the total CVA amount the largest number of cases was registered in the first group of patients (50%). In the second and the third group of patients a smaller number of CVA cases (17.6 vs 23.5%) was registered, while the smallest number of CVA cases was registered in patients without LVP and LVEF over 40% (8.8%). Statistically significant univariable predictors of CVA were LVP and LVEF below 40%, as well as a combination of these tests in patients of the first and the fourth group. It is necessary to point out that LVEF above 40% with negative SEACG was protective with reference to CVA occurrence (RR 0.15, CI 0.04–0.57).

Directly compared, LVP and LVEF variables remained independent CVA predictors although patients with LVP had a higher relative risk (7.22 (CI 2.42–21.63) for CVA occurrence with reference to those with low LVEF (RR 5.14 CI 1.73–15.27). The only independent predictor of the complex ventricular arrhythmia occurrence was registering of LVP and LVEF below 40% in the same patient with RR 14.33 (CI 3.72–55.27), which explained 75% variability of the resulting variable.

Sensitivity, specificity, PPV and NPV of LVP and LVEF with reference to CVA occurrence were important determinants for the use of corresponding diagnostic tests. According to our results sensitivity and PPV of LVP alone were low and had the value of 0.44 and 0.37, respectively, while specificity and NPV were higher, 0.67 and 0.78, respectively. LVEF itself had a higher sensitivity and PPV (0.67 and 0.59, respectively) with reference to LVP, and lower specificity and NPV (0.65 and 0.73, respectively). The combination of LVP with LVEF below 40% with reference to LVP alone for CVA occurrence there were increased sensitivity (0.50), specificity (0.93) and PPV (0.85).

Probability of CVA occurrence in patients with LVP was increased with LVEF decrease. The group of patients with the lowest LVEF (15% in our study) and LVP had the highest probability of CVA occurrence (98%). It must be emphasized that in patients with LVEF 50% and LVP the same probability was 19%, and without LVP 4%. Cumula-
tively, CVA probability in patients with EFLK<40% and LVP was 80%, and in patients with LVEF>40% and without registered LVP the same probability was 10%.

Conclusion

The occurrence of CVA within 6 months after acute MI was significantly (p<0.01) more frequent in patients with LVP compared to the patients without registered LVP. The occurrence of CVA within 6 months after acute MI was significantly (p<0.01) more frequent in patients with LVEF below 40% compared to patients with LVEF over 40%. LVP and LVEF below 40% joined, represented an independent predictor of the CVA occurrence in patients 6 months after MI. LVP combined with LVEF below 40% had the highest sensitivity (0.50), specificity (0.93), PPV (0.85) and NPV (0.72) for the occurrence of CVA 6 months after MI with reference to the LVP and to the LVEF separately. The LVEF over 40% associated with negative result of the SAECG represented a favorable prognostic factor for the occurrence of CVA in patients 6 months after MI.

REFERENCES


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A p s t r a k t


KASPNI KOMORSKI POTENCIJALI U PROCENI RIZIKA ZA NASTANAK SLOŽENIH KOMORSKIH POREMEĆAJA RITMA KOD BOLESNIKA SA INFARKTOM MIOKARDA I SRČANOM SLABOŠĆU

Cilj. Odrediti prognostički značaj kasnih komorskih potencijala i ejekcione frakcije leve komore za pojavu složenih komorskih aritmija (Lown IVa, IVb i V) kod bolesnika lećenih tkivnim aktivatorom plazminogena po ubrzanom protokolu tokom 6 meseci nakon akutnog infarkta miokarda. Metode. Sprovedena je prospektivna, analitička, opservaciona studija. Formirane su četiri grupe bolesnika. Prvu grupu su činili bolesnici sa ejekcionom frakcijom leve komore ispod 40% i kasnim komorskim potencijalima. Drugu bolesnici sa ejekcionom frakcijom leve komore ispod 40% i bez kasnih komorskih potencijala, treću sa ejekcionom frakcijom leve komore iznad 40% i kasnim komorskim potencijalima i četvrtu bolesnici sa ejekcionom frakcijom leve komore iznad 40% i bez kasnih komorskih potencijala. Složene komorske aritmije beležene su na standardnom elektrokardiogramu i dvadesetčetvoročasovnom praćenju elektrokardiograma po Holteru u trećoj nedelji, trećem i šestom mesecu nakon akutnog infarkta miokarda. Kasni komorski potencijali su snimani 30, 90 i 180 dana nakon akutnog infarkta miokarda. Ejekciona frakcija leve komore određena je ekokardiografskim između 15. i 21. dana nakon akutnog infarkta miokarda. Multivarijantnom logističkom regresionom analizom evaluirana je povezanost kasnih komorskih potencijala i ejekcione frakcije leve komore sa pojavom složenih komorskih aritmija. Određeni su i senzitivnost, specifičnost, pozitivna i negativna prediktivna vrednost kasnih komorskih potencijala i ejekcione frakcije leve komore za pojavu složenih komorskih aritmija. Rezultati. U studiju je uključeno 80 bolesnika (73% muškog pola), prosečne starosti 64 ± 3,5 godina. Složene komorske aritmije su zabeležene kod 34 (42,5%) od ukupnog broja bolesnika, ali kod 17 (50%) u prvom grupi (p<0,01). Složene komorske aritmije su zabeležene kod 25 (73,5%) bolesnika sa kasnim komorskim potencijalima, i kod 23 (67,6%) bolesnika sa ejekcionskom frakcijom leve komore ispod 40%. Ejekcionala frakcija leve komore ispod 40% i kasni komorski potencijali su nezavisni prediktori za pojavu složenih komorskih aritmija (RR=14,33, p<0,01). Sensitivnost ejekcione frakcije leve komore ispod 40% i kasnih komorskih potencijala za pojavu složenih komorskih aritmija iznosi 0,50, specifičnost 0,93, pozitivna prediktivna vrednost 0,85, a samih kasnih komorskih potencijala 0,44, odnosno 0,67, odnosno 0,37. Zaključak. U našoj studiji kasni komorski potencijali kod bolesnika sa ejekcionom frakcijom leve komore ispod 40% predstavljaju nezavisni prediktor za pojavu složenih komorskih aritmija 6 meseci nakon prvoga infarkta miokarda lećenog tkivnim aktivatorom plazminogena po ubrzanom protokolu.

K l j uč n e reči: infarkt miokarda; elektrokardiografija; srce, udarni volumen; aritmija; srce, funkcija leve komore; plazminogen, aktivator, tkivni; prognoza.

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