A modern vectorcardiography is a promising method for the study of the electrical activity of the heart from the first minutes of myocardial infarction (MI) that allows to record and analyze the dynamics of the changes of the electromotive force of the heart at the bedside in any phase of MI. Vectorcardiographic (VCG) signs of MI as an input data are used in the Data Mining Decision Tree mathematical algorithm to predict the outcome of the acute phase of MI.

**Aim of research** – to determine the prognostic significance of vectorcardiographic signs of the acute phase of myocardial infarction

**Materials and methods.** In conditions of infarction department 14 patients with primary extensive anterior MI of left ventricle (group 1, 8 women and 6 men, average age - 69 ± 3 years) and 43 patients with combined course of primary MI of front localization and hepatic steatosis or non-alcoholic steatohepatitis (group 2, 23 women and 20 men, average age - 66 ± 2 years) were examined. Patients were hospitalized in the first 24 hours of onset. The study of electromotive force of the heart was performed on a modern cardiodiagnostic multifunctional complex MTM-SCM of Microtherm, Severodonetsk Research and Production Enterprise. To predict the outcomes of MI Data Mining Decision Tree algorithm was used, implemented in the Deducer Studio Academic software package, which is a complete analytical platform that supports Data Mining (the model building process and search of patterns).

**Results and discussion.** Results of VCG-study were used as an input data. To assess the quality of the model Crosstabs visualizer was used. On its basis the correct classification of data in group 1 was determined. Of 11 dead 1 patient was assigned to the survivors, i.e 7.14% of the sample were detected by mistake and the result was achieved with 92.86% accuracy. Decision Tree tab identified only two VCG-markers with certain conditions: "Age" and "The speed of excitation spread along QRS loop in the area of the initial deviation vector BA_1". On "Rules" visualizer only the second rule has sufficient credibility: if patient's age is equal or more than 57.5 years and the speed of excitation spread along QRS loop in the initial deviation vector BA_1 is less than 6.33 mV/s, lethal outcome is predicted. The significance of the "Age" marker was 52.28%. The speed of excitation spread along QRS loop in the initial deviation vector BA_1 is 47.72%. In group 2 the Tree correctly classified almost all examples (97.67%), and of 17 patients only 1 patient that died was assigned to the survivors. On Decision Tree visualizer 6 VCG attributes were allocated: "Opening in QRS loop in the 3rd projection", "Break in the QRS loop in the 2nd projection", "Area of P loops in BA_2", "Angular divergence of QRS-P vector in BA_1", "Angular divergence of QRS-T vector in BA_5" and "Speed of excitation spread along T loop in BA_1 in its end part." On the "Rules" tab the 3rd and the 6th rules have sufficient credibility. The impact of their influence on the fact of death is 21.95% and 31.71% respectively. If an overload of the left atrium (the area of P loops in BA_2 is more or equal to 0.188 mm²) is detected with violation of the repolarization in the anterior wall of both atria (the angular divergence of QRS-P loops in BA_1 is more or equal to 15.5°), combined with a violation of late repolarization process in the anterior wall of the left ventricle (deceleration of speed markers over T loop on its end part in BA_1 is less than 2.338 mV/s) and in basal ventricles (angular divergence of QRS-T vector in BA_5 is less than 41.5°), when the magnitude of damage vector ST (opening in loop QRS) in the 3rd projection is less than 2.834 mm, than with 97.67% accuracy a favorable outcome is predicted. The same outcome with the same accuracy is predicted if the area of P loops in BA_2 is more or equal to 0.188 mm², angular divergence of QRS-P loops in BA_1 is more or equal to 15.5°, but the angular divergence of QRS-T vector in BA_5 is more or equal to 41.5° with an opening in QRS loop in the 3rd projection less than 2.834mm. On "The importance of the attributes" visualizer the most important factors were identified: "The speed of excitation spread along T loop in BA_1 in the end part of the loop" (25.24%), "The area of P loops in BA_2" (18.99%) and "Opening in QRS loop in the 3rd projection" (18.93%).

**Conclusions.** To predict the outcome of extensive anterior myocardial infarction of left ventricle, and in case when it is combined with hepatic steatosis or non-alcoholic steatohepatitis, it is advisable to use Data Mining Decision Tree and VCG-markers. Prognostically significant markers of acute myocardial infarction were determined. If patient’s age was 57 or more, and the
speed of excitation spread along myocardium of the high parts of the anterior wall of the left ventricle slowed to 6.33 mV/s, lethal outcome was predicted with an accuracy of 92.86%. If the increase of the area of atrial loops was registered more than $0.188 \text{ mm}^2$ (in BA$_2$) together with the angular divergence of QRS-P loops more than 15.5° (in BA$_1$), the opening of QRS loop less than 2.834 mm (in the 3rd projections) and the speed of excitation spread in the end part of T loop less than 2.338 mV/s (in BA$_1$) together with different values of the angular divergence of QRS-T vector in BA$_5$, a favorable outcome was predicted with 97.67% accuracy.