Abstract: P3428

Algorythm for estimation of long-term prognosis for patients with AMI complicated with acute cardiorenal syndrome

Authors:
A Siverina¹, EA Skorodumova¹, VA Kostenko¹, EG Skorodumova¹, LP Pivovarova¹, OB Ariskina¹, AN Fedorov¹, AV Rysev¹, M Malishev¹, ¹I.I. Dzhanelidze Research Institute of emergency medicine - Saint Petersburg - Russian Federation,

Topic(s):
Prevention – Cardiovascular Risk Assessment: Scores

Citation:
Objective: to develop medical and statistical model to assess the long-term prognosis (1,5 years) in patients with myocardial infarction (MI) and acute kidney injury (AKI).

Materials and methods: 227 patients treated in our Institute of emergency care were examined. in 2016 about MI. Sex distribution included 60,2% males and 39,8% females. The average age - 67,1 ± 4,2 years. 1-st group included 105 patients with AKI, 2-nd one - 122 patients without AKI. Cohorts were comparable by sex and age. Patients were followed-up for 18 months: 15 patients died (12 with in the 1-st group, 3 in the 2-nd). At the hospital biochemical and haematological tests (glucose, serum creatinine and WBC levels) were performed, as well as polymorphisms of the NOS3 gene T786C were detected. Results were statistically processed.

Results and discussion: medico-statistical model was created for the total sample of deaths in the long term period using the method of the classification trees (See Fig.1). Data obtained showed that the first order node was the distribution of genotypes of polymorphism t786c of NOS3 gene. Patients with the homozygous genotype ?? died 10 times more often - 27,8%, people’s with the genotypes TT and TC mortality was 2,6%. In patients with the genotype ?? elevated levels of WBC in the blood was found, and their levels in frames of 9,9-12,0 ×10?/l were correlated with mortality increased by 97,8%, and further WBC elevation up to 12 ×107 /l led to 100% mortality. A third-order node can be considered as the level of serum creatinine at the time of discharge. It’s elevation >127 µmol/l correlated with increased mortality in patients with TT and T? genotype by 21,4%, and with associated hyperglycemia >9,3 mmol /l reached 100%. Leukocytosis in patients with TT and T? genotype and serum creatinine >127 µmol/l increased mortality up to 15,5%. The obtained model was tested with the use of ROC-analysis. The area under the curve was – 0,97, which corresponds to the expert assessment as "excellent". The sensitivity of the model was 93,9%, specificity 83,5%.

Conclusion: the proposed medical-statistical model, which includes biochemical(serum creatinine), haematological (WBC) and genetic (polymorphism t786c of NOS3 gene) markers, allows to predict unfavorable outcomes in patients with MI and AKI for a long-term period up to 1,5 years.
Objective: to develop medical and statistical model to assess the long-term prognosis (1.5 years) in patients with myocardial infarction (MI) and acute kidney injury (AKI).

Materials and methods: 227 patients treated in our Institute of emergency care were examined. About 70 patients had AKI, and 157 patients did not. The average age was 67.1 ± 4.2 years. The first group included 105 patients with AKI, and the second group included 122 patients without AKI. The cohorts were comparable by sex and age. Patients were followed-up for 18 months: 15 patients died (12 in the first group, 3 in the second group). At the hospital, biochemical and hematological tests (glucose, serum creatinine, and WBC levels) were performed, as well as polymorphisms of the NOS3 gene T786C were detected. Results were statistically processed.

Results and discussion: medico-statistical model was created for the total sample of deaths in the long term period using the method of the classification trees (See Fig.1). Data obtained showed that the first order node was the distribution of genotypes of polymorphism t786c of NOS3 gene. Patients with the homozygous genotype CC died 10 times more often - 27.8%, people’s with the genotypes TT and TC mortality was 2.6%. In patients with the genotype CC, elevated levels of WBC in the blood were found, and their levels in frames of 9.9–12.0 × 10^9/l were correlated with mortality increased by 97.8%, and further WBC elevation up to 12 × 10^9/l led to 100% mortality. A third-order node can be considered as the level of serum creatinine at the time of discharge. Its elevation >127 µmol/l correlated with increased mortality in patients with TT and TC genotype by 21.4%, and with associated hyperglycemia >9.3 mmol/l reached 100%. Leukocytosis in patients with TT and TC genotype and serum creatinine >127 µmol/l increased mortality up to 15.5%. The obtained model was tested with the use of ROC-analysis. The area under the curve was - 0.97, which corresponds to the expert assessment as “excellent”. The sensitivity of the model was 93.9%, specificity 83.5%.

Conclusion: the proposed medical-statistical model, which includes biochemical (serum creatinine), hematological (WBC) and genetic (polymorphism t786c of NOS3 gene) markers, allows to predict unfavorable outcomes in patients with MI and AKI for a long-term period up to 1.5 years.