ABSTRACT

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Factors influencing the efficacy of treating ST Elevation Myocardial Infarction with percutaneous coronary intervention.

Aim

The aim of the paper was to identify the factors which influence the efficacy of Percutaneous Coronary Intervention (PCI) treatment in patients with ST Elevation Myocardial Infarction (STEMI).

Material and Method

The study method was a retrospective analysis of the medical documentation of patients treated at the Acute Coronary Syndromes Ward at St. Queen Jadwiga Hospital No 2 in Rzeszow from 2009 to 2013. The analysis pertained to medical documentation of 508 patients with STEMI who were staying at the ward due to acute coronary syndrome being treated with PCI. The study tool was an original questionnaire.

Results

The success of the treatment in the study group defined as patient's survival along with level 3 flow on TIMI scale was obtained in 434 patients (85.4%). The treatment did not succeed in case of 74 patients (14.6%). It was noted that the percentage of treatment failures was almost 1.5 times higher among women (12.9% vs. 18.6%). The risk of failure is 3 times higher in patients who suffered a pre-hospital circulatory arrest prior to the infarction (43.9% vs. 12.0%) (p = 0.0000). Failure in treatment applied to 2/3 of the patients, 71% presenting symptoms of cardiogenic shock (p= 0.0000). It was observed that lipid disturbances have a statistically significant impact on the treatment's result. More cases which were unsuccessful were noted among patients who had no confirmed history of treating hyperlipidemia (20.2% vs. 4.0%). Significantly more cases of treatment failure were noted among people who denied smoking (17.4% vs. 8.6%) (p = 0.0087). A statistically significant relation was noted between the place of the infarction being the anterolateral wall and the treatment failure (p = 0.0049). The risk of the death increased significantly in patients who had been operated on at the left main coronary artery (LM) (50% vs. 14%) (p = 0.0103). Higher levels of carbamide, creatinine and glucose were observed in patients whose treatment was unsuccessful. The p values for every parameter discussed were lower than 0.001.

While considering the death risk factors in patients with MI treated with percutaneous coronary intervention (PCI) it was noted that there was a higher mortality rate in patients who had not been diagnosed with high blood pressure prior to the infarction (p = 0.0001). The mortality rate

was a couple times higher in patients with a myocardial infarction complicated by a pre-hospital circulatory arrest (p = 0.0000). The factor that also raises mortality risk is cardiogenic shock (p = 0.0000). In patients diagnosed with hyperlipidemia there was a lower mortality rate observed (p = 0.0000). Prior interventions at coronary arteries influenced significantly the mortality rate. 17% of patients died, which was twice as high as in the rest of the patients in study (p = 0.0210). A statistically significant dependency was noted between the time from the symptoms onset and the first contact with medical professionals. The time before the doctor was called for was 6 hours in the group of patients who died. However, in the surviving group this time was almost two Times shorter (p = 0.0345). Significantly higher level of glucose were noted in the group of patients who died (p = 0.0000).

While discussing the factors influencing a significant narrowing in the coronary arteries it was observed that hypertension was connected with a higher risk of narrowing of at least one of the coronary vessels (p = 0.0071). The analysis of the material showed that an MI complicated by a pre-hospital circulatory arrest has a significant impact on the risk of a substantial narrowing of the coronary vessels (62% vs. 34%). It was confirmed that transferring the patient to the nearest hospital was related to a substantial narrowing of at least one of the coronary vessels (p=0.0480). There is a statistically significant correlation between the age and the number of coronary vessels affected by the narrowing. The number of vessels narrowed rose proportionally to the patients age (p=0.0001). A bigger number of substantially narrowed vessels was confirmed in patients with hypertension (p=0.0101) and in the group of patients who denied smoking (p = 0.0000).

Conclusions

1. Among the demographic factors analyzed the only factor contributing to treatment failure in patients treated for myocardial infarction with percutaneous coronary intervention was age.

2. Among the behavioral and somatic factors analyzed the only factors contributing to treatment failure in patients treated with PCI were: untreated hypertension, hyperlipidemia and smoking denial.

3. Laboratory parameters contributing to treatment failure in patients with MI treated with PCI were higher levels of glucose carbamide and creatinine in blood serum. The parameters contributing to positive treatment outcome were higher levels of troponin, blood cells and total cholesterol (Total-C).

4. Sudden circulatory arrest, cardiogenic shock complicating the myocardial infarction and previous surgical interventions at the coronary arteries increased the risk of PCI failure.

5. Infarction of the lateral and anterolateral wall and critical narrowing of the main left coronary artery (LM) and right coronary artery (RCA) were associated with the risk of PCI failure

and patient's death.