

Abstract

Acute chest pain is a common reason for examination at the emergency department. Elderly patients often have atypical symptoms, nonspecific changes on the electrocardiogram, and elevated levels of cardiac biomarkers from various causes. Differential diagnosis is quite broad and the aim of the examination at the emergency department should be to quickly rule out life-threatening conditions such as acute coronary syndrome, pulmonary embolism, or aortic dissection. Structured decision aid rules are accurate and can accelerate the diagnostic process, however we do not have sufficient data for the use of decision aids in the population of elderly.

The aim of this work was: 1) to describe the clinical characteristics and occurrence of cardiac events in seniors examined at the emergency department for acute chest pain, 2) to identify risk factors for major cardiac events and 3) to compare the effectiveness and safety of selected decision aid rules for the rapid diagnosis of acute myocardial infarction in the population of elderly.

We performed an analysis of patients older than 70 years who were examined within one year at the Department of Emergency Medicine of the University Hospital Hradec Králové for acute chest pain. Patients with ST segment elevations on the electrocardiogram were excluded from the study. We included 250 patients with a median age of 78 years with multiple comorbidities (42 % ischemic heart disease, 58 % dyslipidaemia, 83 % hypertension, 29 % diabetes mellitus). During examination at the emergency department, 61 % of the patients had atypical chest pain, 2/3 of patients had no new ischemic changes on the ECG and the average troponin value (hs-TnT) was only slightly elevated (16 ng/l). Within 30 days after the initial examination, 19 % of patients had an acute myocardial infarction (AMI), 11 % underwent myocardial revascularization, and 4 patients (1.6 %) died. By using multivariate analysis, we identified the following most significant risk factors for major cardiac events: typical anginal chest pain, vomiting and relief of pain after nitrates.

In the second part of the thesis, we compared the effectiveness of 6 selected decision-making protocols: T-MACS, HEART, EDACS, TIMI, GRACE and ADAPT, as well as our own hypothetical strategy of decision-making based on only one parameter – level of troponin. The T-MACS protocol had the best results for rule-out and rule-in AMI in the elderly population. The TIMI score can also be used to confirm a myocardial infarction. On the contrary, the ADAPT protocol had the lowest specificity in rule-in diagnostics of AMI. HEART and EDACS models are also very safe to rule out myocardial infarction, on the other hand, GRACE, ADAPT models and the strategy of decision-making based only on the troponin level (solo TnT strategy) are not suitable, as they did not meet the predefined safety and efficacy criteria.

The results of this work confirm that patients with acute chest pain in old age often have atypical symptoms, normal or only non-specific changes on the electrocardiogram and a high prevalence of comorbidities. These patients also have an increased cardiovascular risk and a high incidence of cardiac events, even though non-cardiac causes of chest pain predominate in this age group as well. Our work shows that the use of decision protocols in the elderly with chest pain in the emergency department is safe and effective.