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tytuł pracy: **„Czynniki wpływające na śmiertelność u pacjentów hospitalizowanych w Oddziale Intensywnego Nadzoru Kardiologicznego - rola niedokrwistości i zaburzeń gospodarki żelazowej”**

Summary

The population of patients admitted to Intensive Cardiac Care Unit (ICCU) is heterogeneous. The greatest groups are those with acute coronary syndromes (ACS) and acute decompensated heart failure (ADHF). Although anemia is a common finding in patients requiring intensive care, this problem is often underestimated and minimized. Iron deficiency and anemia of chronic diseases coexist in the majority of ICCU patients. In some cases anemia may also be a consequence of increased risk of bleeding in course of treatment (invasive procedures, anticoagulants, antiplatelet drugs). It is commonly known that anemia and iron deficiency are indicators of unfavorable clinical profile and predictors of poor prognosis, thus it is crucial to keep alert in the diagnosis and treatment. The current European Society of Cardiology (ESC) guidelines do not specify comprehensive recommendations how to manage these two problems in patients with acute cardiac conditions.

Material and methods

The non-selected population of 392 patients (mean age 70 ± 13.8 years, 43 % women), consecutively admitted to the ICCU was prospectively assessed. The incidence and prognostic value of anemia and parameters of iron status have been analyzed. We also analyzed other potential prognostic factors such as: main diagnosis at admission, clinical profile (heart rate, arterial blood pressure, heart failure advancement according to NYHA classification), routinely assessed biochemical parameters and echocardiographic variables, as well as the need of blood transfusion. In the first original study the composite end point was death from any cause during hospitalization, whilst in the second one death after discharge [mean observation period 29.3 (± 18.9) months].

Results

The study population consisted of patients with acute ACS (43%), ADHF (31%) and other acute cardiac states (26%) like pulmonary embolism, severe heart rhythm or conduction disturbances, septic shock, and cardiac tamponade. The prevalence of anemia (according to WHO criteria) and iron deficiency (ID) were 64% and 63%, respectively.

Anemia was less frequent in patients with ACS as compared to the remaining ICCU population *(p=0.019)*. 7.9% of the patients needed a red blood cell transfusion (RBC Tx).

In-hospital mortality was 3.8%. Among patients who died lower parameters of iron status, but not hemoglobin (Hb) concentrations were found *(p<0.05)*. The analysis of logistic regression indicated the highest risk of death for age [odds ratio (OR) 1.38, 95 % CI 1.27–1.55], serum iron concentration (SIC) [OR 0.85, 95% CI 0.78–0.94], total iron binding capacity (TIBC) [OR 0.95, 95 % CI 0.91–0.98], left ventricle ejection fraction (LVEF) [OR 0.85, 95 % CI 0.77–0.93], as well as hospitalization for non-ACS [OR 0.25, 95 % CI 0.14–0.46], *(p<0.05)*. The risk of death during hospitalization tended to increase with decreasing levels of TIBC *(p=0.49)*. Our study indicated that parameters of the iron status, but not anemia *per se*, independently influence in-hospital mortality.

Long-term mortality was 38.8%. Patients who died were significantly older and had lower baseline levels of Hb, SIC, TIBC, cholesterol, LVEF, lower estimated glomerular filtration rate (eGFR) as well as higher white blood cell (WBC) counts and C-reactive protein (CRP) levels ($p<0.05$). In the multivariate regression analysis predictors of death were age, Hb, LVEF, WBC and CRP. The most powerful factor was hospitalization for non-ACS. The risk of long-term mortality increased with decreasing levels of Hb ($p<0.001$), SIC ($p=0.001$), TIBC ($p= 0.009$), and the need for RBC Tx ($p< 0.001$) as well as the diagnosis of ADHF ($p<0.001$) and the hospitalization for non-ACS ($p= 0.007$). The results of our studies indicate that apart from anemia, variables like age, Hb, inflammatory parameters and LVEF are strong predictors of long-term mortality in ICCU patients.

Conclusions

Hemoglobin level and parameters of iron status are two closely related conditions. There are data indicating that they have independent prognostic values. Our studies provided new data. Firstly, iron status disturbances have stronger impact on in-hospital mortality, whilst anemia is more valuable in prediction of death in long-term observation. Secondly, patients with acute coronary syndromes have better prognosis than those with acute decompensated heart failure. Moreover, we would like to point out that in therapy of patients with acute cardiac conditions it is very important to reduce the risk of bleeding, to assess not only peripheral morphology but also parameters of iron status and, finally, iron supplementation in the case of its deficiency.