ABSTRACT

COVID-19 remains a life-threating disease with a very heterogenous clinical presentation for risk patients. Recently, there has been an effort to find a suitable laboratory marker for early and reliable assessment of prognosis of this disease. The scoring systems seem to be suitable markers with more complex evidential value. This diploma thesis is engaged in the importance of COVID-19 prognostic score then, which was developed and validated by the Sysmex Europe GmgH corporation in Hamburg (a subsidiary of Sysmex Corporation in Kobe) in the collaboration with European university hospitals. It is a score calculated from ten hematological parameters, which were proven to change dynamically at the onset of COVID-19. This score and the changes in selected hematological and biochemical parameters were observed depending on the course of COVID-19. The observed laboratory markers included WBC, Lymf, Neu, Eo, IG, Delta-He, DDI, FBG, NLR, CRP, PCT, IL-6, ferritin and troponin T.

The theoretical part of the diploma thesis is engaged in the general characteristic of COVID-19, the description of its causative agent, the virus SARS-CoV-2, the diagnostics, therapy, and prevention of the disease. The experimental part is engaged in the statistical analysis of the results of the individual observed parameters and the comparison of their values at the patients with mild and severe course of COVID-19.

The statistical analysis showed that the values of the parameters WBC, Neu, IG, DDI, FBG, NLR, COVID-19 score, CRP, PCT, IL-6, ferritin and troponin T are higher at the patients with severe course of COVID-19 than at the patients with mild course. On the contrary, the values of the parameters Lymf, Eo and Delta-He are lower at the patients with severe course than at the patients with mild course of the disease.

In addition, the cut-off value was determined for the parameters NLR and COVID-19 score. The cut-off value > 5,7 for NLR was determined as the optimal cut-off value (AUC 0,844), which had the sensitivity 81,82 % and the specificity 75,74 %. The optimal cut-off value > 1 was determined the for the COVID-19 prognostic score (AUC 0,855), which was characterised by the high sensitivity 91,89 % and the specificity 71,65 %.

The COVID-19 prognostic score turned out to be a suitable parameter for the early stratification of patients with COVID-19. The values of the score 2 and higher predicted severe course of this disease.

Key words: COVID-19, COVID-19 prognostic score, hematological parameters, biochemical parameters, Sysmex XN, Cobas 8000