



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Kabirov I.¹, Pavlov V.¹, Alekseev A.¹, Tarasenko A.²

¹Bashkir State Medical University, Dept. of Urology, Ufa, Russia, ²Sechenov First Moscow State Medical University, Institute of Urology and Human Reproductive Health, Moscow, Russia

Introduction & Objectives: Among COVID-19 patients, parameters are urgently needed to predict the progression of acute kidney injury (AKI) and the need for admission to an intensive care unit (ICU) to ensure proper allocation of hospital resources. This study proves that the analysis of AKI markers by ELISA on a urine sample upon admission to the hospital can be used to detect AKI, which is a predictor of severe course and outcome of coronavirus infection.

Materials & Methods: Our study involved 153 patients with COVID-19 hospitalized between April 10, 2020 and June 9, 2020. Depending on the severity of the course of the disease, the patients were divided into 2 groups: patients who do not need mechanical ventilation during treatment (including nasal oxygenation) - 95 patients, patients on mechanical ventilation - 58 patients. The average age of the patients was 63.1 ± 5.4 . Venous blood and urine samples were obtained on days 1, 3, 7 and 10 of hospitalization. Detection of AKI markers in urine samples was measured using ELISA Kit for NGAL, Cys-C, IL-18 (Cloud-Clone Corp. PRC) according to the manufacturer's instructions.

Results: In group I of patients who did not require mechanical ventilation, AKI, in accordance with the KDIGO criteria, was detected in 20% of cases, in group II - 55. In group I, grade 1 AKI prevailed (61%), in group II - more patients with stage 3 (terminal) PPP - (47%). In contrast to patients treated in the intensive care unit, patients with moderate COVID-19 had a concentration of NGAL, IL-18, Cystatin C, significantly lower than patients with a severe course of the disease throughout the entire period of hospitalization. The average NGAL values in patients with severe course were 57.4 (45.1-78.8) ng / ml, and statistically significant differences between the groups were revealed already on the 1st day of hospitalization. The average IL-18 values were 65.7 (38.1-93.7) ng / ml in severe patients. A statistically significant difference was also revealed on the 1st day of hospitalization. The mean values of Cystatin C in the serum of patients with severe course were 2.18 (2.13-2.23) ng / ml, the most statistically significant difference between the groups was found on the 3rd day of hospitalization.

Conclusions: It has been shown that NGAL, IL-18, Cystatin C can predict AKI in patients with COVID-19 to an increase in serum urea and creatinine levels, which can help in the early prevention of severe coronavirus infection. If confirmed by others, these results and the algorithm will allow early prediction of future intensive care unit demand, better targeting of AKI-targeted prevention strategies, which may also apply to assessing the risk of severe outcomes in outpatients.