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SOFTWARE PRODUCT FOR CLINICAL AND IMMUNOLOGICAL PROGNOSIS OF THE SEVERITY OF COVID-19

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ABSTRACT: One of the global problems at the moment is the Coronavirus (COVID-19). Everyone already knows all the consequences of COVID-19. In addition, determining the course of the severity of the disease is also an important factor for both the patient and the medical staff. Until now, there are various methods and standards for the treatment of COVID-19. But for determining the severity of the disease, no standard or protocol has yet been defined. To solve this problem, we studied clinical and immunological tests in 109 patients and tried to create a program to predict the severity of COVID-19 in the early stages of the disease, so that, during the treatment for the severity of the disease, we started.

KEYWORDS: COVID-19, software, "CIP-COV.exe", cytokines, immunity.

INTRODUCTION: The progress of clinical medicine to a certain extent depends on the level of diagnosis, prognosis and treatment of patients. The last decades have been characterized by a rapid growth in the number of diagnostic methods, the introduction of the latest electronic equipment, which makes it possible to identify the subtle mechanisms of the pathological process.

As everyone knows, to this day, the weight of the world suffers from coronavirus infection. The exact molecular mechanisms of COVID-19 mediated pathogenesis are still being investigated. However, lessons learned from SARS-CoV and MERS-CoV infections may reveal some of the key features of the pathologies associated with COVID-19 (1), as well as the molecular mediators and signaling pathways involved. Inoculation of SARS-CoV-2 of epithelial cells of the human respiratory tract in vitro causes cytopathic effects and cessation of beating

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of cilia of epithelial cells, similar to the cytopathic effect observed during infection with SARS-CoV. At the same time, to date, there is not a single treatment for coronavirus infection, as well as a prognosis for the course of COVID-19. But many authors offer treatment regimens depending on the severity of the disease (3).

The aim of the work was to develop integral characteristics of the clinical and immunological prognosis of the severity of the course of COVID-19 using a software product.

RESULTS: To solve this problem, a data array of 109 patients with various courses of COVID-19 was used. To enter the initial information into a computer for the purpose of its subsequent statistical processing, a special coding card was developed for the examination of patients, which included 20 clinical indicators related to the outcome and course of the disease.

The patients were divided into several groups: 1) control group (32 patients); 2) a group of patients with moderate severity (80 people); 3) a group of patients with severe course (29 patients).

The choice of the least squares method was due to the fact that in the study of medical processes, we are dealing with statistical data. That is why statistical data processing is carried out in almost every medical problem and serves as one of the stages of information processing.

Regression analysis is used to identify patterns, that is, to build mathematical models. And here the method of least squares is widely used, which is the basic method of regression analysis.

The calculations were performed on an IBM Pentium-type personal computer using the "STATISTICA-10" statistical software package (3).

The high value of the coefficient of determination of equations (3-7) testifies to the high efficiency of the obtained models. This served as the basis for the development on their basis of the software tool "Clinical and immunological prognosis of the severity of COVID-19 course" (CIP-COV.exe), for which the copyright certificate of the Patent Office of the Republic of Uzbekistan No. DGU 12771 dated 09.29.2021 was received.

DISCUSSION: With the help of this program, we have a chance to predict the severity of COVID-19 with laboratory and immunological data. During hospitalization, in patients, as in the standard, a laboratory study is determined, such as a general blood test, a general urinalysis, a biochemical analysis, and also for an accurate diagnosis, we need to study the level of D-demir, procalcitonin and coagulogram. In addition to laboratory tests, we need to study the

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immunological status. To determine the body's immune response, we proposed to study IL-1β, IL-2, IL-6, TNF-α. These cytokines, as studied by foreign scientists, play a key role in the "cytokine storm". Based on the data of the above analyzes, if we write the answers to the program, then the program will give us a prognostic level of the severity of the disease, since this will be a key moment for us in determining the pathogenetic treatment. After establishing an accurate diagnosis, it will be easier for doctors to determine the severity of the disease, and will focus on the treatment and rehabilitation of patients with COVID-19.

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