31st ECCMID
9 – 12 July 2021
ABSTRACT

02830 SARS-CoV-2 antibody repertoire related to disease severity

12. COVID-19

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Background

Study the distribution of antibodies to the main proteins of the virus in different periods after the onset of symptoms in patients with different severity of the disease.

Methods

A total 363 serum samples from patients with clinical and laboratory confirmed COVID-19 infection from COVID clinics of Privolzsky federal District, Central Russia, were included in the study. 87 samples were from patients with asymptomatic or mild course of the disease (AM) (from 1 to 51 days from onset of illness), 45 samples were from patients with bilateral pneumonia of the first severity according to computed tomography (CT-1) (2 - 33 days from onset of illness), 141 samples were from patients with second severity (CT-2) (2 - 39 days from onset of illness) and 90 specimens from patients with third severity according to CT (CT-3) (4 - 31 days from onset of illness). These serum samples were tested with ELISAs measuring IgG specific for SARS-CoV-2 RBD or nucleocapsid (N).

Results

For first week after onset of disease there is significant difference between AM (66,7%), CT-2 (18,2%), p=0.01 and CT-3 (22,2%) p=0.04 groups in the frequency of anti-RBD IgG detection. At the initial stage of the disease, the prevalence of anti RBD is higher in individuals who do not develop serious complications in the future than in patients with a subsequent severe clinical picture. Over time, the difference in the frequency of detection of individual serological markers disappears in groups with different severity of the disease. No such difference was found for anti N, except for AM (55,6%) and CT- 2(27,3%) (p=0.05).

For two first weeks after symptoms onset the ratios of OD of anti-RBD to OD of anti-N in ELISA (RBD/N) were calculated for each sample. For severe patients (CT2,3), the frequency of detecting higher RBD/N ratio is significantly lower (16.7%) than in the group of patients with mild disease (44.4%), p=0.04.

The figure shows distribution of the ratio of OD anti-RBD to the OD anti-NW for the compared groups.

Conclusions

This observation can help predict the possibility of a severe course of the disease.