

THE IMPORTANCE OF S-REACTIVE PROTEIN, PROCALCITONIN, AND CYTOKINES IN DETERMINING THE PROSPECT OF SARS-COV-2-ASSOCIATED PNEUMONIA

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Abstract

Coronavirus infection (COVID-19), considered an acute infectious disease caused by the SARS-CoV-2 virus, is characterized by activation of the hemostasis system. As a result of this, severe cases can develop ya ni coagulopathy. Whether COVID-19 is the direct cause of this condition or whether they occur with the development of an infectious process remains unclear for the time being. The frequency of occurrence of asymptomatic and clinically specific thrombotic, thromboembolic complications in COVID-19 remains uncertain. This condition is largely associated with difficulties in diagnosis. However, according to some data, patients with COVID-19 have a much higher frequency of venous and arterial thrombosis. In this case, the peculiarities of the course of the disease, the search for the factors that causes it and the interest in them from the point of view of study, aroused interest and gave rise to many munazaras.

Keywords: COVID-19, SARS-CoV-2, thrombotic, thromboembolic complications, venous and arterial thrombosis.

Complications of a new coronavirus infection (COVID-19) are characterized by very different clinical manifestations. Among them, thromboembolic complications play the most important role [6,10]. Soon after the start of the pandemic, doctors noticed that patients with COVID-19 often develop thrombosis with different localization.

They were often arterial, and in some cases venous thrombosis. It was found that deep vein thrombosis can reach up to 79% in patients hospitalized with a new coronavirus infection [9]. Several changes in the coagulogram have been described in patients with COVID-19. SARS-CoV-2 virus, in particular, causes abnormalities such as decreased prothrombin time, increased levels of fibrinogen and D-dimer in the blood. It should be noted that the degree of deviation of these signs is also directly related to the severity of the patient's condition: for example, elevated levels of D-dimer are more common in patients lying in intensive care units, and its average level is the category is higher than in non-resuscitated patients [5,16,18]. The use of anticoagulant therapy in hospitalized patients with a new coronavirus infection has significantly reduced mortality [12,17]. At the same time, when assessing the time parameter of an increase in platelet activity in patients with a new coronavirus infection, an impression is made of its secondary nature in relation to the activation of plasma hemostasis. Plasma hemostasis is activated from the first days. And platelet activity is 9 of the disease-

Increases significantly in the 10th days [7,19]. The activation of plasma hemostasis appears to be the main cause of coagulopathy caused by a new coronavirus infection. SARS-CoV-2 causes sufficient tissue damage caused by the virus. This in turn leads to the activation of the immune system. As a result of this, the tissue factor is activated. Eventually esa causes activation of plasma hemostasis, due to hyperproduction of various anti-inflammatory IL-6, TNF-a cytokines. The rotational

thromboelastometry and thrombodynamics test is used to assess global processes of thrombosis formation and lysis. With these methods, it is possible to determine the exact hypercoagulation in patients with a new coronavirus infection. They showed high density and volume of the thrombus, as well as high rates of its formation [14,20].

In COVID-19, changes in indicators that characterize the state of the hemostasis system and are associated with the severity of the disease and its prognosis, an increase in D-dimer levels in the blood, an increase in prothrombin time, as well as an increase in thrombin and partially activated thromboplastin time (QFTV) were studied. At first, an increase in the concentration of fibrinogen can be observed in this case. After that, the level of fibrinogen and antithrombin in the blood decreases. This condition is also associated with the severity of thrombocytopenia and its prognosis, and is rarely severe. It is one of the factors that helps to activate this halo that is called immunotrombosis. That is, an increase in the concentration of cytokines produced as anti-inflammatory of the blood clotting system [8,14].

He was in the intensive care unit of 3 hospitals in Denmark. 13% of 184 patients with COVID-19 have died. While arterial thromboembolism was fatal in 31% of these patients, severe complications such as deep vein thrombosis, pulmonary embolism, ischemic stroke, myocardial infarction were reported in the remaining patients. Meanwhile, objectively confirmed venous thromboembolic complications prevailed over arterial thrombosis. That is, pulmonary artery thromboembolism (O'ATE) accounted for 27%, while arterial thrombosis boron fat accounted for 3.7%. In a retrospective study of the only center in China, severe COVID-19 patients (n=81) lying in an intensive care unit had a 25% incidence of deep vein thrombosis (CHVT). In an analysis of 107 patients with CODID-19 time pneumonia who were successively admitted to the resuscitation unit in Lille (France), O'ATE incidence was 20.6%. This case In the same period of 2019, there was a much higher rate of 6.1% compared to patients of exactly the same weight. In autopsies, microthrombs have been described in the capillary vessels of the lung. As the main causes of these disorders, the specific effects of viral infection, inflammation, were considered progressive coagulopathy [3,4,21]. In a one-center retrospective study in China, with covid-19 lying in an intensive care unit, 81 patients with severe pneumonia had a D-dimer > 1500 ng / ml with sensitivity of 85.0% and specificity of 88.5 [2]. Patients with COVID-19 without strict guidelines, given the inadequacy of the usual instrumental examinations, most experts now believe that screening is not necessary to prove whether there are venous thromboembolic complications (TEA) in asymptomatic patients with very high D-dimer levels [1]. It has been proposed to use two widely used scales in sepsis to assess the nature of hemostasis system disorders in patients with COVID-19. It appears that the first of these characterizes the activation of blood clotting processes during coagulopathy caused by sepsis and indicates a stage of the process that is not yet coagulopathy. There is evidence that this scale can be used to select patients with COVID-19 who are more likely to benefit from the use of anticoagulants. Thus, there were severe manifestations of COVID-19 that were successively admitted to Tongji University Hospital in Wuhan, China

A retrospective study of the electronic medical records of 499 patients revealed 28 of the patients who received mainly preventive doses of heparin. In cases where the sum of scores on the Sepsis-induced coagulopathy scale was >4 or there was a significant increase in blood D-dimer levels, daily mortality was low [13]. The presence of disseminated intravascular coagulation syndrome (DVS) indicates the development of coagulopathy when it is necessary to replenish the missing components of the blood clotting system. The occurrence of DVS is associated with poor prognosis. Thus, of the 183 patients with COVID-19 confirmed during hospitalization, DVS was recorded in 71.4% of deaths and only 0.6% of those discharged [11] in the study cited above.

Thus, the SARS-CoV-2 virus leads to activation of the hemostasis system at different levels. Especially from damage to lung tissue, local endothelial damage can lead to plasma hemostasis and platelet activation in the course of the disease. In patients hospitalized with a new coronavirus infection, regular use of anticoagulant therapy seems to be guaranteed. These questions require further research.

Conclusion

1. In the pathogenesis of COVID-19, thrombus activation and thromboembolic complications are an important element. Their severity is related to the severity of the manifestation of COVID-19 and its prognosis. Much remains unclear in the prevention and treatment of TEA in COVID-19.
2. Taking into account previously known facts about the selection of methods of treatment of a particular patient, the feedback of the expert community, which is quickly summing up data on the results of COVID-19 and their various interventions, these experiments remain the priority of the currently operating attending physicians.:Bikdeli B, Madhavan MV, Jimenez D, et al. COVID-19 and Thrombotic or Thromboembolic Disease: Implications for Prevention, Antithrombotic Therapy, and Follow-up. *JACC*. 2020. doi:10.1016/j.jacc.2020.04.031.

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