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Research Article

ANALYSIS OF THE USE OF ANTITHROMBOTIC THERAPY IN PATIENTS WITH CORONAVIRUS INFECTION

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ABSTRACT

Coronavirus infection is considered a multifactorial disease; nevertheless, thrombotic complications play an important role in the further prognosis in this category of patients. More than 20 studies have been conducted around the world that have evaluated the optimal thromboprophylaxis regimens in hospitalized patients with COVID-19. Before prescribing antithrombotic therapy, it is necessary to conduct a comprehensive assessment of the parameters of the blood coagulation system. Of course, in all cases of chronic diseases, especially in the elderly, careful monitoring of clinical symptoms and the hemostasis system is required. The data of our study indicate the possibility of using rivoraxaban and acetylsalicylic acid in prophylactic doses in the absence of the need to adjust doses and drug regimens in patients with moderate to severe COVID-19.

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KEYWORDS

Coronavirus infection, antithrombotic therapy, rivaroxaban, acetylsalicylic acid.

INTRODUCTION

Coronavirus infection often causes hypercoagulability with inflammation, accompanied by an increase in the level of blood clotting factors and disruption of the normal homeostasis of vascular endothelial cells, leading to thrombosis of large vessels and thromboembolic complications in severe patients. In the most severe cases, it can lead to DIC and consumption coagulopathy [5]. In some patients with COVID-19, there is an increase in the blood level of D-dimer and an increase in prothrombin time, thrombin time, and activated partial thromboplastin time. Initially, an increase in the concentration of fibrinogen is possible; then, as the disease progresses, blood levels of fibrinogen and antithrombin may decrease. In some cases, thrombocytosis or thrombocytopenia is detected, which is rarely severe and is aggravated by the occurrence of consumption coagulopathy.

Disruption of normal endothelial function leads to a proinflammatory and procoagulant state. The development of systemic inflammation, activation of the hemostasis system [4], endothelial dysfunction, and depression of bronchoalveolar fibrinolysis in many patients with COVID-19 leads to an increased risk of developing arterial and venous thrombosis, which dictates the need to prescribe antithrombotic drugs. Prevention of pathological thrombosis and fibrin formation with the help of antithrombotic drugs makes it possible to reduce the risk of thrombosis and embolism, respiratory failure, and patient death and subsequently facilitates rehabilitation [2].

An analysis of the pathogenesis of a new coronavirus infection indicates a significant impact of rheological disorders on its course and outcomes. It is known that chronic diseases of the cardiovascular system are associated with the risk of severe course and death both in COVID-19 [3] and in other infectious diseases. In this regard, in each case, it is necessary to study the interaction and mutual influence of the various components of the treatment program prescribed to such patients.

Purpose of the study: to study the tactics of introducing patients with coronavirus infections to antithrombotic drugs.

MATERIAL AND RESEARCH METHODS

We retrospectively analyzed 50 case histories of patients who received treatment at the multidisciplinary clinic of the Tashkent Medical Academy in 2021. All patients had a confirmed coronavirus infection (a moderate form of the disease). The first (main) group included 25 patients who received rivaroxaban 10 mg once a day. The second (control) group included 25 patients who received acetylsalicylic acid 75 mg once a day. All patients were prescribed treatment in accordance with the 8th version of the Interim Guidelines "Prevention, Diagnosis, and Treatment of Novel Coronavirus Infection (COVID-19) in the Republic of Uzbekistan," which was current at the time of the start of therapy.

The age of the patients ranged from 37 to 79 years. The period from the onset of the disease ranged from 1 to 3 days. Signs of lung tissue damage (from 15 to 25% of the volume) (CT-1) were detected in 21 (84%) patients in the main group and in 22 (88%) patients in the control

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group. All subjects were monitored daily for clinical symptoms, body temperature, and blood oxygen saturation. The following were also studied: a general blood and urine test; a coagulogram; and a study of the concentrations of D-dimer and ferretin.

A comparison of indicators was carried out using the program Statistica v. 10. The mean values, standard deviation, and Student's t-test were evaluated. Differences were considered significant at p< 0,05.

RESEARCH RESULTS AND DISCUSSION

When comparing age indicators, there were significant differences. Thus, in the main group, the average age of patients was 63,6 7 ± 7,2 years, and in the control group, it was 60,57 ± 3,9 years (p < 0,05).

Most patients in both groups suffered from combined comorbid pathology. Obesity, arterial hypertension, ischemic heart disease, and type 2 diabetes mellitus were the most frequently recorded among patients. In the main group, 3 patients (12%) had atrial fibrillation, and 2 patients (28%) had thrombophlebitis of the lower extremities. Patients in the control group also had almost the same chronic diseases. All patients with comorbid pathology received standard therapy according to national guidelines (antihypertensive, antianginal, hypoglycemic, and bronchodilator drugs).

In the first group of patients receiving rivaroxaban, recovery was noted in 21 (84%) cases. After 1 month, 23 (92%) patients had a complete recovery, while fibrotic changes in the lungs persisted in 6 (24%) of them. In 2 (8%) patients at the time of discharge from the hospital, despite ongoing therapy, oxygen saturation in the blood remained below 90, and maintenance oxygen therapy was recommended for these patients. In the case histories, there were no adverse reactions to rivoroxaban during therapy.

In the second group of patients receiving acetylsalicylic acid, 20 (80%) patients recovered within a month. One month later, at discharge from the hospital, almost all 24 (96%) patients had no clinical symptoms of COVID-19. Fibrotic changes in the lungs persisted in nine (36%) patients. Adverse reactions of acetylsalicylic acid during therapy in the case histories were not identified.

The most significant changes were found in the study of the coagulogram in the first group of patients (p<0,05). In 72% of patients (n = 18), a decrease in activated partial thromboplastin time (APTT) was detected, while 60% (n = 15) of them had lung damage. In 100% of patients (n = 25) an increase in the level of fibrinogen and prothrombin index (PTI) was detected, while in 84% (n = 21) of them, changes in the lungs were detected on computed tomography. 76% of patients (n = 19) with coronavirus infection had elevated levels of D-dimer in the blood; all of these patients were diagnosed with pneumonia.

In the second group of patients, the shifts in the coagulogram were of a moderate nature. In 52% (n = 13) of patients, hypercoagulability was noted in terms of APTT. Elongation of prothrombin time and PTI was observed in 44% (n = 11). In 56% (n = 14) of patients, an increase in the level of D-dimer in the blood was noted, and in 68% (n = 17) of patients, an increase in the level of fibrinogen was noted. In all these patients, the diagnosis of pneumonia was confirmed.

In the first (main) group of patients, as a result of therapy with rivaroxaban in hospitalized patients, normalization of coagulogram parameters was observed in 92% (n = 23) of patients. At the time of discharge from their hospital, 8% (n = 2) had elevated levels of fibrinogen and D-dimer. In the second group, treated with acetylsalicylic acid, 76% (n = 19) of patients at discharge had normal coagulation parameters. In

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20% (n = 5) of patients, the blood fibrinogen level remained high.

In order to assess the safety of antithrombotic therapy, we retrospectively studied the analysis of the incidence of gastrointestinal bleeding as the most frequent and life-threatening hemorrhagic complication. But no such side effect was noted in any case history.

There were no deaths in either treatment group.

The results of our study confirm that all links of the hemostasis system are disrupted in the pathogenesis of coronavirus infection, and the role of this system in the progression of the disease is obvious. At the same time, these studies indicate the possibility of using rivoraxaban and acetylsalicylic acid in prophylactic doses in the absence of the need to adjust doses and drug regimens in moderate to severe COVID-19.

CONCLUSIONS

Thus, in our study, it was found that taking antithrombotic drugs in patients with coronavirus infection and concomitant comorbid pathology reduced the likelihood of a severe course of the disease. In no case was there such a side effect as bleeding, which suggests the safety of the use of rivoroxaban and acetylsalicylic acid in prophylactic doses.

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