Study of the Effect of Antipsychotic Drugs on the Parameters of the Blood Clotting System in Patients with Schizophrenia

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Abstract. With the discovery of psychotropic drugs, it was possible to solve the problem of relieving psychomotor agitation in patients suffering from mental disorders, reduce behavioral disorders, and treat productive and negative psychopathological symptoms. But over time, the undesirable effects of antipsychotic drugs were revealed. One of these effects of neuroleptic drugs is their effect on the hematological parameters of the blood. Violation of hematological parameters can affect both changes in the number of shaped elements, changes in the lipid spectrum, and the effect on the blood clotting system.

Keywords: coagulogram, fibrinogen, antipsychotic drugs, mental disorders, blood clotting system.

A feature of the current stage of development of psychiatry is its unity with psychopharmacology. Until 1950 of the last century, there was no concept of "psychopharmacology", although some substances that affect the mental functions of a person were known. The mentally ill were treated with a variety of methods – cold baths, wrapping in wet cloth, pyrotherapy, occupational therapy1,2. Arousal was stopped by large doses of sleeping pills and narcotic drugs 3,5. The resulting effect was often insufficient in volume and unstable. The development of psychopharmacology has given psychiatry a new, effective method of targeted therapy 6,8. The first antipsychotic drug is chlorpromazine, which was created in France in 1952. A little later, haloperidol was synthesized in Belgium. These drugs were the founders of neuroleptics 7. With the discovery of medicinal psychotropic drugs, it was possible to solve the

problem of relieving arousal, normalizing behavior, as well as psychoprophylaxis. However, over time, the shortcomings of psychopharmacotherapy were also revealed. The range of side effects with the use of psychotropic drugs was expanded together with the synthesis of new drugs and their long-term use. One of the undesirable effects of these drugs is the effect on the blood system 1. According to O. Oyesanmi et al. the prevalence of severe side effects on the blood system is 1-2 cases per year per 100,000 people treated with psychotropic drugs 5. Violation of hematological parameters can affect both changes in the number of shaped elements, changes in the lipid spectrum, and the effect on the blood clotting system 6.

The aim of the scientific work was to study the undesirable effects of antipsychotic drugs on the parameters of the blood clotting system in patients with schizophrenia.

Clinical observations were carried out with the participation of patients suffering from various forms of schizophrenia (according to ICD 10-F20. 0-20. 7), who are being treated in the Mordovian Republican Psychiatric Hospital. All studies were carried out with the consent of patients, in accordance with the "Law on Psychiatric Care and guarantees of the rights of citizens in its provision". The study involved 15 men and 15 women aged 21 to 54 years, with an average age of 46.6+3.2. The criterion for inclusion of patients in the study was the presence of schizophrenia. The exclusion criteria are the presence of organic pathologia, severe somatic diseases. Treatment of patients was carried out by traditional methods: from the first day of stay in the hospital, antipsychotic drugs were prescribed in medium therapeutic dosages. Assessment of psychopathological symptoms was carried out using modified Avrutsky-Zaitsev maps (Avrutsky G. Ya., Zaitsev S. G., 1975). The criteria for the effectiveness of pharmacotherapy were: the completeness of the reduction of the severity of psychopathological symptoms, a decrease in the frequency of their occurrence, and the restoration of the social and labor status of patients. The blood clotting system was evaluated by the dynamics of prothrombin time, prothrombin index, and plasma concentrations of fibrinogen 9,10.

The study of prothrombin time showed that a change in this indicator was observed in 11 people, while in 8 people its decrease was noted: in 6 cases with combined treatment with aminazine and haloperidol; in 2 cases with propazine. Increased prothrombin time

It was observed in 3 people: in the treatment with aminazine in 1 case; in the treatment with neuleptil in 1 case; in the treatment with propazine in 1 case. Prothrombin time is the time of formation of a fibrin clot in the plasma when calcium chloride and thromboplastin are added to it. The test results reflect the activity of prothrombin complex factors-I, II, V, VII, and X. The values of the prothrombin time are presented in seconds, indicating the control values obtained during the study of the control normal plasma 4, 11, 12.

When analyzing the prothrombin index, its change was revealed in 9 people, of which an increase in this indicator was observed in 8 cases: in the treatment of haloperidol and aminazine in 4 cases; in the treatment of aminazine in 1 case; in the treatment of propazine in 2 cases; in the treatment of triftazine in 1 case. When treated with propazine, a decrease in the indicator was detected in 1 case. The prothrombin index is the ratio of the clotting time of the control ("normal") plasma to the clotting time of the patient's plasma. This index shows the activation processes of the external folding path. It is displayed as a percentage, normally it is 90-105% 4, 13, 14.

INR ("international normalized ratio") - calculation of the indicator based on a mathematically calculated formula. The INR is calculated using a formula that takes into account the patient's prothrombin time and a special MICH coefficient (the international sensitivity index of the thromboplastin reagent). The use of INR allows you to compare the results obtained in different laboratories at any time. This is a standard indicator for doctors of medical organizations in all countries. It is the result of the INR test that is the basis for selecting the dose of anticoagulants, for plasma transfusions, prescribing other drugs, and for determining further treatment tactics. Normally, the INR varies in the range of 0.85 -1.15 4, 15, 16.

Fibrinogen is a protein produced in the liver and converted into insoluble fibrin – the basis of a clot during blood clotting. Fibrinogen according to the international nomenclature is a factor I (first) of the blood plasma coagulation system. It is produced by the liver and released into the blood along with several other substances that affect its clotting. If a blood vessel or tissue is damaged, the body begins hemostasis, or blood clotting, resulting in the appearance of a blood clot (blood clot), which helps to slow down and then stop bleeding. In the process, strands of protein called fibrin are formed. They intertwine, forming a fibrin network, which, together with platelets, contributes to the formation of a blood clot, which remains at the site of damage to the vessel until it is completely healed. The level of fibrinogen in the blood increases in acute inflammatory diseases, as well as in tissue necrosis. In other cases, its increase may signal acute infectious and inflammatory diseases, strokes, myocardial infarctions, hypothyroidism, amyloidosis, pneumonia, and malignant tumors. The reason for the increase in the level of fibrinogen is surgery, burns, the patient's use of estrogens or oral contraceptives. Measured against gram per liter (g/l) varies in the range of 2-4 g/l.

You have installed the variation of this ratio in 20 cases, in all cases there was an increase in fibrinogen in the treatment of: triftazine and chlorpromazine – 1 case; triftazine – 4 cases; haloperidol and chlorpromazine – 7 cases; haloperidol – 1 case; propazine 7 cases

Conclusions

Most of the changes in the parameters of the blood clotting system were observed in women, and in most cases this is a change in the indicators of fibrinogen, the same changes in the indicators of INR and prothrombin time. In men, as well as in women, changes in the parameters of fibrinogen, changes in the prothrombin index and slightly less INR are predominant. Most of all changes were detected in the treatment with aminazine, less with haloperidol. Less changes were found in the treatment with triftazine, propazine. From the study, it can be concluded that a group of antipsychotic drugs affects the change in the parameters of the blood clotting system, the mechanisms of these disorders require further study.

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