kidneys. Suppression of malaria toxicity promotes a quicker restoring of an adequate immune response of the body.

This approach of intensive care with the preventive procedure of extracorporeal hemocorrection method led to a reduction in mortality from 84 to 6.8% in patients with severe forms of *P. falciparum* malaria.

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CURRENT PROBLEMS IN DIAGNOSTICS AND TREATMENT OF STRONGULOIDIASIS

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Long-term observations of patients with various helminthiases showed that strongyloidiasis remains one of the most problematic regarding diagnosis of the disease. It is difficult to make a differential diagnosis on the basis of clinical symptoms due to its polymorphism.

Diagnostic errors of strongyloidiasis were discovered in 38 enrolled patients. It should be noted that incorrect diagnosis led to a change in the nosological structure of the disease. Years ago strongyloidiasis was misdiagnosed with such pathological conditions as acute or chronic enteritis, pancreatitis, bile duct dyskinesia, eosinophilic pneumonia, food poisoning, food infection, typhoid paratyphoid and nontyphoid disease. In recent years, strongyloidiasis was taken for acute leukemia, malignant tumors, Whipple's syndrome and Crohn's disease. Other investigators (N.I. Tumolskaya et al., 2014) reported about "masks" of strongyloidiasis.

Despite a comprehensive approach to laboratory diagnostics of chronic strongyloidiasis according to guidelines, examination of stool specimens (baermann technique) and investigation of the duodenal contents are rarely implemented in clinical laboratories. Therefore parasitological diagnosis of helminthiasis often is established with a significant delay.

Ivermectin is currently the drug of choice in the treatment of strongyloidiasis. It is suitable for the treatment of acute, chronic and disseminated forms of the diseases. A Nobel Prize in 2015 was awarded for its discovery. In the Russian Federation, ivermectin is neither registered nor produced. An alternative drug albendazole is used with a daily dose of 400–800 mg 1–2 times for 3 days. Albendazol is a drug of foreign origin and is available all over the country. Its effectiveness is insufficient and in some cases repeated courses of treatment are required. With early diagnostics and treatment with effective anthelmintic drugs and adequate rehabilitation pathogenetic therapy, the prognosis is usually good, with the exception of immune compromised cases (HIV/AIDS, tuberculosis, non-specific inflammatory diseases, etc.).

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ANALYSIS OF POPULATIONS OF *BACILLUS ANTRACIS* STRAINS ON THE BASIS OF THEIR RESISTANCE TO SPECIFIC ANTHRAX BACTERIOPHAGES

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The specific anthrax bacteriophage lysis is a compulsory test in the scheme of identification of *B. anthracis* strains, however it does not enable us to estimate quantitatively the presence of phage resistant clones in the population of the strain.

The aim of the study was to investigate the population composition of two virulent strains of *B. anthracis* on the base of phage resistance to specific bacteriophages.

Spore suspensions of typical virulent *B. anthracis* strains 1 (SO) and 81/1 were used as suspensions in a 30% glycerin solution kept in sealed ampoules at 4–6°C for more than 20 years. Concentrations of phage corpuscles in experimental batches of bacteriophages Gamma A-26, BA-9, K-VIEV were, correspondingly, 8×10^9, 4×10^8 and 2×10^8 per 1 ml. Accurately 0.1 ml of a spore suspension in a concentration of 1×10^3 were applied to Hottinger's agar and spread over its surface. When the liquid was absorbed completely, one of the bacteriophage preparations was applied to test plates, moistening the whole surface of plates. Plates which were not treated with bacteriophage preparations served as controls.

Not a single colony grew on plates of both strains treated with bacteriophage Gamma A-26. Plates treated with bacteriophage K-VIEV showed a 2.9% growth of colonies of the control of the strain *B. anthracis* 1 (SO) and a 4.8% growth of colonies of the strain *B. anthracis* 81/1. Plates treated with phage BA-9 showed a 10.9% growth of colonies of the strain *B. anthracis* 1 (SO) and a 17.3% growth of colonies of the strain *B. anthracis* 81/1, correspondingly. For further determination of sensitivity to all the three bacteriophages we used 12 colonies of each strain, which showed resistance to phages K-VIEV and BA-9 at the first stage.

The retest showed that in both strains 16.7% of variants separated on the base of their resistance to bacteriophage BA-9 were sensitive to all the three bacteriophages. Among variants of the strain *B. anthracis* 81/1 which were selected from the plates treated with bacteriophage BA-9 such variants made up 20%, and in *B. anthracis* 1 (SO) — 10%. Among variants of both strains variants resistant to the action of bacteriophages Gamma A-26 and BA-9 and sensitive to bacteriophage K-VIEV were found. Among variants of *B. anthracis* 1 (SO) selected from cultures treated with bacteriophage BA-9, 80% were sensitive to bacteriophages BA-9 and Gamma A-26 and resistant to bacteriophage K-VIEV.

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COMPARATIVE CHARACTERIZATION OF SUBCULTURES ISOLATED FROM A POPULATION OF *BACILLUS ANTHRACIS* 1 (SO) STRAIN ON THE BASIS OF PHAGE RESISTANCE TO SOME SPECIFIC ANTHRAX BACTERIOPHAGES

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On the basis of many phenotypic properties the causative agent of the anthrax shows not only intraspecific variability between strains, but also intrapopulation variability in some strains.

The aim of the work was to study a complex of phenotypic properties and genetic characteristics of variants of the virulent strain *B. anthracis* 1 (SO) in the group of isolated on the basis of resistance to specific anthrax bacteriophages Gamma A-26, BA-9, K-VIEV and to carry out their comparative analysis.

We used the initial strain *B. anthracis* 1 (SO). Concentrations of phage corpuscles in experimental batches of bacteriophages Gamma A-26, BA-9, K-VIEV were, correspondingly, 8×10^9, 4×10^8 and 2×10^8 per 1 ml. The criterion for selection of cultural variants was their resistance to bacteriophages. Phenotypic properties and genetic characteristics of isolated subcultures were defined according to the Guidelines 4.2.2413-08.

After treatment of spore cultures on Hottinger's agar with each of the bacteriophages separately, incubation for 24 hours at 37°C, phage resistant cultural variants being distinguished from the initial typical strain by capsule formation and toxin production, hemolytic, proteolytic

and lecithinase activities, incapable of spore germination on the basal medium or on media with bicarbonate in conditions of increased CO_2 concentration were isolated.

In the group of subcultures resistant to bacteriophage K-VIEV 5 of the 8 subcultures were incapable of germination in the atmosphere of increased CO_2 concentration while among cultures of other groups there were no such strains. The group of 9 subcultures resistant to bacteriophage BA-9 included two cultures differing in their plasmid composition ($pXO1^-$, $pXO2^+$; $pXO1^-$, $pXO2^-$). All the 4 subcultures of the group resistant to bacteriophage Gamma A-26, had the genotypes differing from the initial strain and one of them also differed from the others of the group, exhibited low proteolytic activity, the absence of lysis of sheep erythrocytes and expressed ability to immunoprecipitation on a synthetic medium with anthrax γ-globulin.

Thus, in three groups of subcultures of the strain *B. anthracis* 1 (SO), which were isolated on the base of phage resistance to specific anthrax bacteriophages, we revealed not only variability of biological properties, but also peculiarities of phenotypic properties and genetic properties which are more characteristic of certain groups.

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MODERN DIRECTIONS IN OPTIMIZATION OF RABIES SURVEILLANCE

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Rabies is one of the oldest and most studied infections in both animals and humans. Despite the available opportunities for its specific prevention laid by L. Pasteur, it is still impossible to overcome rabies. Against the backdrop of a steady increase in the incidence of animal rabies, 191 cases of human infection have been reportedin Russiasince the beginning of the century. More than a thousand unfavorable rabies areashave been identified annually. At least 300 000 people on average seek for medical attention. Economic damage from animal bites amounts more than 3.5 billion rubles a year.

At the same time, recent scientific advances allow us to identify modern directions for the optimization of both epizootic and epidemiological surveillance of rabies. In view of the assessment of the current surveillance system in Russia, the main directions include the improvement of the information base, both epizootic and epidemiological diagnostics, as well as surveillance technology based on an integrated risk assessment and the introduction of molecular biological methods.

It is required to create one unifiedinformation resource that contains not only data on the incidence of both human and animal rabies, but also on the dynamics of epidemiologically significant risk factors. These factors include environmental, climatic and social conditions that contribute to the emergence and preservation of risks, as well as the biological characteristics of the pathogen. Thus, such modern resource allows to combine information collected by the participants of sanitary-epidemiological, medical, veterinary and other services. It will serve as a database to create a special geoinformation system in the future. The purpose of this system is the assessment of epizootic and epidemiological risks, as well as forecasting the situation of rabies on its basis. The importance of molecular diagnostics and monitoring also cannot be underestimated. The development ofnew diagnostic tests and scientifically based approach to monitoring organization contribute to enhancement of surveillance effectiveness.