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COMPREHENSIVE ASSESSMENT OF CENTRAL NERVOUS SYSTEM DAMAGE IN MDR PULMONARY TUBERCULOSIS

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Abstract
Despite significant advances in modern medicine, tuberculosis continues to be one of the leading causes of infectious morbidity and mortality in the world. MDR tuberculosis of the lungs is particularly dangerous, characterized by the resistance of mycobacteria to the main anti-tuberculosis drugs. This form of the disease is characterized by a severe clinical course, a high incidence of complications and an unfavorable prognosis. The development of neurological complications in MDR pulmonary tuberculosis depends on a number of factors. The most significant of these are considered to be the duration of the disease, the prevalence of the tuberculosis process, the severity of respiratory failure and the degree of chronic intoxication.

Keywords: MDR tuberculosis, central nervous system, neuroimaging, electroencephalography, hypoxia, neurological complications, brain..

Introduction

In recent years, more and more attention has been paid to studying the risk factors for developing brain damage in patients with MDR pulmonary tuberculosis. However, data on the prognostic value of clinical, neurophysiological, and neuroimaging indicators remain insufficiently systematized. Identification of the most significant factors influencing the development of neurological complications will make it possible to identify high-risk groups in a timely manner and optimize diagnostic tactics in this category of patients [4,6,7].

One of the most serious problems of modern phthisiology remains the high incidence of complications in MDR pulmonary tuberculosis due to the long course of the disease, severe intoxication and systemic damage to the body. Neurological complications are of particular importance, which significantly worsen the quality of life of patients, reduce the effectiveness of treatment and often lead to permanent disability[5]. Damage to the central nervous system in MDR pulmonary tuberculosis is formed under the influence of a complex of pathogenetic factors, including chronic hypoxia, toxic effects of inflammatory products, vascular disorders and immunodeficiency conditions[1-3].

The purpose of this study is to analyze the factors influencing the prognosis of neurological complications and brain damage in MDR pulmonary tuberculosis.

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Materials and methods of the study, 67 patients with MDR pulmonary tuberculosis and 27 practically healthy individuals from the control group were examined in accordance with the set goal and objectives. All 67 patients studied were divided into two groups: the main group consisted of 34 (50.6%) patients with MDR pulmonary tuberculosis suffering from damage to the central nervous system, and the comparison group consisted of 33 (49.4%) patients with MDR pulmonary tuberculosis without signs of CNS damage. The clinical and neurological manifestations of the disease, the severity of pathological changes in the nervous system, as well as neurophysiological and neuroimaging parameters, depending on the degree of lung damage, were studied in the examined patients.

All patients underwent a general clinical examination, including an analysis of complaints, neurological status, assessment of cognitive functions and the degree of asthenoneurotic manifestations. Neurophysiological research methods, including electroencephalography and evoked potentials, were used to assess the functional state of the central nervous system. Neuroimaging methods are represented by magnetic resonance imaging and computed tomography of the brain. The obtained results have been subjected to statistical processing using modern methods of variational statistics.

The results of the study

The data obtained indicate that the development of neurological complications in MDR pulmonary tuberculosis is multifactorial and closely related to the severity of the underlying disease. The use of a comprehensive neurophysiological and neuroimaging examination allows timely detection of early signs of damage to the central nervous system and predicting the further course of the pathological process.

The analysis suggests that the most significant risk factors for the development of neurological complications in MDR pulmonary tuberculosis are the long course of the disease, the widespread nature of the tuberculosis process, severe chronic intoxication and respiratory failure. Patients with severe disease are expected to have a higher incidence of asthenoneurotic and cognitive impairments, as well as marked changes in the bioelectric activity of the brain.

It is assumed that patients with widespread lung damage will more often show signs of chronic cerebral hypoxia, manifested by diffuse changes in the electroencephalogram, impaired cortical-subcortical interactions and decreased functional activity of the brain. At the same time, the duration of the MDR tuberculosis process can be considered as one of the key prognostic factors for the formation of structural changes in the central nervous system.

Neuroimaging studies are expected to show that patients with an unfavorable course of the disease are much more likely to have discirculatory changes, focal lesions of the white matter and moderate atrophic processes. The severity of these changes is likely to increase as respiratory failure progresses and hypoxic syndrome increases.

An additional risk factor for brain damage may be the presence of concomitant somatic diseases that contribute to the deterioration of cerebral hemodynamics and a decrease in the adaptive capabilities of the body. Patients with combined pathology may develop cognitive disorders, emotional instability, and signs of autonomic dysfunction earlier.

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Conclusion

The most significant factors influencing the prognosis of neurological complications and brain damage in MDR pulmonary tuberculosis are the duration of the disease, the degree of prevalence of the tuberculosis process, the severity of chronic intoxication and respiratory failure. Neurophysiological and neuroimaging changes reflect the degree of functional and structural damage to the central nervous system and can be used as prognostic criteria for the unfavorable course of the disease. An integrated approach to assessing the condition of patients with MDR pulmonary tuberculosis makes it possible to increase the effectiveness of early diagnosis of neurological complications and improve the prognosis of the disease.

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