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FEATURES OF THE COURSE AND DIAGNOSIS OF PULMONARY TUBERCULOSIS IN PATIENTS WITH COPD

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Abstract: The combined pathology of pulmonary tuberculosis (TB) and chronic obstructive pulmonary disease (COPD) represents a serious medical and social problem . Both diseases have similar risk factors (smoking, advanced age), which determines their high frequency of comorbidity . The mutually aggravating influence of TB and COPD leads to an atypical course of tuberculosis, complicates its timely diagnosis, worsens functional respiratory parameters and the prognosis for patients. This review analyzes current concepts regarding the epidemiology, pathogenesis, clinical features, diagnosis, and treatment of TB/COPD coinfection.
Key words : tuberculosis, COPD, comorbidity , diagnosis, course, treatment.

Introduction. Chronic obstructive pulmonary disease (COPD) and tuberculosis (TB) are among the most common respiratory diseases worldwide. For a long time, these pathologies were considered in isolation, but accumulated data indicate a synergistic relationship between them [1]. COPD, characterized by Persistent airflow restriction creates conditions in the lungs favorable for the development of tuberculosis infection. On the other hand, a history of tuberculosis is an established risk factor for the development of residual changes and COPD [2]. Detecting tuberculosis in the presence of COPD is associated with significant difficulties due to the subtle clinical picture and similar radiographic changes, leading to late diagnosis and the development of widespread, destructive forms of the disease.
The objective of the review is to analyze modern literary data on the characteristics of the course, diagnosis and principles of treatment of pulmonary tuberculosis in patients with COPD.
1. Epidemiology and risk factors
Epidemiological studies demonstrate that patients with COPD have a 2-3-fold higher risk of developing tuberculosis compared to the general population [3]. This risk directly correlates with the severity of obstruction: in patients with an FEV1 < 50% predicted, the risk of developing TB increases more than 4-fold [4].
The main risk factors for the development of TB in patients with COPD:

- Smoking: Is a common leading risk factor for both pathologies. Smoking impairs mucociliary clearance, inhibits alveolar macrophage function, and disrupts the immune response, facilitating the penetration and proliferation of * Mycobacterium tuberculosis * [5].
- Long-term inhaled corticosteroid (ICS) therapy: Widely used in COPD, but may suppress local cellular immunity, which is essential for anti-TB protection [6].
- Old age: Associated with immunosenescence (aging of the immune system) and the presence of multiple comorbid conditions.
- The presence of residual post-cervical changes: Serve as a favorable substrate for the reactivation of endogenous infection.

2. Pathogenetic relationships
The pathogenesis of TB and COPD comorbidity is multifactorial:
1. Impaired mucociliary clearance and macrophage function. Chronic inflammation in COPD, characterized by neutrophil infiltration and protease release, damages the airway epithelium and

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disrupts innate immune mechanisms. This facilitates the adhesion and penetration of mycobacteria.
2. Dysfunction of cellular immunity. COPD, especially in combination with smoking, is characterized by impaired function of T-lymphocytes (both CD4+ and CD8+) and dendritic cells, which critically weakens anti-tuberculosis defense [7].
3. Systemic inflammation. COPD is a disease with a systemic inflammatory component, which can further modulate the immune response, reducing resistance to tuberculosis infection.
3. Features of the clinical course of tuberculosis in patients with COPD
The clinical picture of tuberculosis in patients with COPD is often atypical, which is the main cause of diagnostic errors.

- Symptom attenuation: Classic "tuberculosis" intoxication symptoms (fever, night sweats, significant weight loss) may be absent. Increasing respiratory symptoms become more prominent: increasing shortness of breath, increased sputum volume and purulent content , and worsening cough. These manifestations are often regarded as an exacerbation of COPD [8].
- Predominance of destructive forms: In this category of patients, fibrous-cavernous and infiltrative-destructive forms of tuberculosis are significantly more often detected.
- Localization of the process: The tuberculous process is often localized in the upper lobes of the lungs, where in COPD bullae and pronounced fibrosis are often present, which masks specific changes.

4. Difficulties in diagnosis
Diagnosis of tuberculosis in patients with COPD requires a comprehensive approach and high alertness of the physician.
Radiological diagnostics: On a standard chest radiograph, tuberculous infiltrates may be masked by hyperinflation , emphysematous bullae, and peribronchial fibrosis. The "gold standard" in this situation is computed tomography (CT), which allows for the detection of foci, cavities, and specific changes invisible on conventional radiography [9].
Microbiological diagnostics: This is crucial to confirm the diagnosis. However, patients with COPD often have scant Bacterial isolation . Repeated examination of sputum by microscopy and culture methods is necessary, as well as the use of molecular genetic methods (Xpert MTB/RIF, Xpert MTB/RIF Ultra), which have high sensitivity and speed of execution [10].
Tuberculin diagnostics and IGRA tests: The Mantoux test may be falsely negative due to anergy associated with immune dysfunction. Interferon tests (IGRA - T-SPOT.TB, QuantiFERON -TB Gold) are more reliable and less dependent on the patient's immune system.

5. Principles of treatment and patient management
Treatment of patients with TB/COPD co-infection is complex and includes:
1. Anti-tuberculosis therapy: Conducted according to standard DOTS regimens, taking into account the sensitivity of the pathogen. Careful monitoring of drug tolerance is necessary, as this category of patients, often elderly, has an increased risk of hepatotoxic and neurotoxic reactions.
2. COPD therapy: Continued in full, including bronchodilators (β2-agonists, anticholinergics) and ICS. However, during the period of tuberculosis treatment, the ICS dose must be reviewed and, if possible, minimized under the control of the patient’s condition [6].
3. Respiratory support: Oxygen therapy , respiratory rehabilitation.
4. Treatment of comorbid conditions.

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Conclusion

The combination of tuberculosis and COPD represents a complex clinical problem characterized by mutual aggravation, an atypical tuberculosis course, and diagnostic difficulties. Pulmonologists and general practitioners must exercise high oncological and phthisiological vigilance in patients with COPD, especially those from high-risk groups. The active use of modern imaging techniques (CT) and highly sensitive molecular genetic tests allows for timely diagnosis and initiation of appropriate therapy. The management of these patients requires a multidisciplinary approach involving a phthisiologist, pulmonologist, and general practitioner to improve prognosis and quality of life.

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