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Clinical and radiological and endoscopic Manifestations of inflammation of the bronchial tree in tuberculosis combined with nonspecific lung diseases

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Abstract
The peculiarities of the clinical manifestations and clinical course of nonspecific inflammation with destructive pulmonary tuberculosis.
The study involved 300 patients with destructive pulmonary tuberculosis at the age of 15 to 78. Of these, 93 (31.0%) patients were selected who had tuberculosis combined with chronic bronchitis and who formed the first examination group. The second group of those examined included 207 (69.0%) pulmonary tuberculosis patients without chronic bronchitis. The clinical and laboratory, radiological and bronchoscopic study methods were used to conduct the examination.
Based on the analysis of examination results of newly diagnosed destructive tuberculosis patients, high frequency of chronic bronchitis that occurs before the development of specific inflammation was determined using the clinical and laboratory, radiological and bronchoscopic methods. The results of endoscopic studies revealed that in case of destructive pulmonary tuberculosis the nature of endobronchial changes depended on the duration and prevalence of specific inflammation and had two variants of the course: nonspecific diffused inflammation of bronchus as a result of chronic bronchitis and the so-called reactive paraspecific endobronchitis as a consequence of toxic and allergic reactions of tuberculous process.
The results obtained showed that there are two variants of endobronchitis in destructive pulmonary tuberculosis: nonspecific chronic bronchitis existing before the onset of tuberculous inflammation as an independent nosological form, as well as the so-called reactive "paraspecific" endobronchitis caused by tuberculosis intoxication, irritant and allergic influence of sputum produced from the cavern of destruction.

Keywords: tuberculosis, chronic bronchitis, clinical, radiographic and endoscopic studies.

1. Introduction
The scientific studies of recent years confirm the growth of nonspecific inflammatory respiratory diseases, particularly chronic bronchitis and chronic obstructive pulmonary disease and the nature of bronchologic changes in pulmonary tuberculosis [1, 2, 3]. Increasing incidence of tuberculosis in the background of chronic bronchitis, in which there are common manifestations of both diseases hampering timely detection of specific process [4, 6]. In addition, the very tuberculosis, even if clinically cured, promotes the development of chronic nonspecific lung pathology that is associated with metatuberculous residual changes and tendency to torpid and recurrent course of the underlying disease [7].
Considering the peculiarities of tuberculosis pathomorphosis, the problem of correlation of the above diseases requires in-depth study, especially with regard to the prevalence of this combination in newly diagnosed tuberculosis patients and in patients with residual changes in lungs. The study of the initial symptoms, peculiarities of the clinical course, treatment and diagnostic tactics and effectiveness of mixed form therapy [5, 8] is especially topical.
The aim of the investigation is to study the peculiarities of the clinical manifestations and clinical course of nonspecific inflammation in destructive pulmonary tuberculosis.

2. Materials and methods
300 patients with destructive pulmonary tuberculosis at the age of 15 to 78 were under observation. Of these, 93 (31.0%) patients were selected who had tuberculosis combined with chronic bronchitis and who formed the first examination group. The second group of those examined included 207 (69.0%) pulmonary tuberculosis patients without chronic bronchitis. Prolonged smoking, the presence of foci of chronic nonspecific inflammation of the upper air passages and frequent acute respiratory viral diseases, which contributed to the development of chronic bronchitis, occurred in 82 (82.2%) patients of the first group. In the second group, they

were determined in 109 (52.7%) patients. Complaints of dyspnea were present in 29 (31.2%) patients of the first group and 21 (10.1%) patients of the second group.

3. Results and Discussion

A major cause of chronic bronchitis in patients with pulmonary tuberculosis was smoking, which contributed to the development of chronic bronchitis accompanied by a persistent cough, immunosuppression and lack of manifestations of pulmonary tuberculosis which prolong the timing of its diagnosis. This explains the high incidence of pulmonary tuberculosis when seeking medical advice, that is when clinical symptoms are obvious. In a group consisting of patients with pulmonary tuberculosis combined with chronic bronchitis a percentage of patients seeking medical advice was significantly higher than in a group of patients with tuberculosis only - respectively 82.9% and 79.2% (Table 1).

Table 1: Peculiarities of detection and clinical course of new-onset destructive pulmonary tuberculosis

Characteristics	Pulmonary tuberculosis without chronic bronchitis		Pulmonary tuberculosis with chronic bronchitis	
	Abs.	%	Abs.	%
Number of patients	207	69.0	93	31.0
Men	128	62.0	88	95.0
Smoking	109	52.7	82	89,2
Complaints of dyspnoea	21	10.1	29	31.2
Tuberculosis diagnosed: - **when seeking medical advice** - **during periodic health examinations**	 164 43	 79.2 20.6	 77 16	 82.8 7.1
Acute onset of tuberculosis	31	15.0	26	27.9
Tuberculosis forms: - **disseminated** - **infiltrative** - **fibro-cavernous**	 63 116 28	 30.4 56.0 13.5	 37 45 11	 39.8 48.3 11.9
Bacterioexcretion: **- MTB (–)** **- MTB (+)**	 27 180	 13.0 86.9	 5 88	 5.4 94.5
Accelerated ESR	63	30.4	49	52.6
Leukocytosis	29	14.0	29	32.0
Treatment outcomes: **- Cessation of bacterioexcretion** **- of these up to 2 months** **- healing of destructions** **- of these up to 4 months** **- of these up to 6 months**	 176 122 173 111 161	 97.7 67.8 83.5 53.6 77.7	 85 39 76 25 69	 96.6 44.3 81.7 26.8 76.2

In patients with chronic bronchitis an acute onset of tuberculosis was observed more frequently (27.9%) than without it (15.0%), the increased ESR (52.6% and 30.4%) and leukocytosis (32, 0% and 14.0%) were determined almost twice as often. Thus, destructive pulmonary tuberculosis that occurs in a background of nonspecific chronic bronchitis, has more acute course, is accompanied by fever and severe signs of inflammation.

In both groups of the examined patients the forms of pulmonary tuberculosis were practically similar, but Mycobacterium tuberculosis (MBT) was more often found in tuberculosis patients with chronic bronchitis - in 88 (94.5%), than in patients with tuberculosis alone - 180 (86.9%). That is, the tuberculous process in patients with chronic bronchitis was more evident, widespread and often accompanied by bacterioexcretion than in pulmonary tuberculosis patients without chronic bronchitis.

Patients in both groups were given the conventional Antimycobacterial therapy with isoniazid, rifampicin, streptomycin, ethambutol or pyrazinamide. In case of nonspecific inflammatory changes in bronchi the antimicrobials, inhaled bronchodilators (Combivent®, Berodual®), corticosteroids (budesonide, Beclometasonum), mucolytic and symptomatic agents were used.

As a result of treatment bacterioexcretion suspended with equal frequency in both groups examined: in patients without chronic bronchitis in 176 (97.7%) cases, with bronchitis – in 85 (96.6%) cases. However, the rate of bacterioexcretion cessation in patients with pulmonary tuberculosis in combination with chronic bronchitis were significantly slower: by the end of the second month of chemotherapy formation of mycobacteria stopped only in 39 (44.3%) patients of the first group in comparison with the patients with tuberculosis alone without comorbidity – in 122 (67.8%) patients.

Healing of caverns was almost similar: in patients with tuberculosis combined with chronic bronchitis in 76 (81.7%) cases, without bronchitis – in 173 (83.5%) patients. However, the healing process of caverns of destruction in concomitant chronic bronchitis was much slower: within four months of chemotherapy the healing of caverns was observed in 25 (26.8%) patients with comorbidity, while in patients with pulmonary tuberculosis alone – in 111 (53.6%) cases.

Analyzing the outcome of intensive care of patients with tuberculosis combined with chronic bronchitis where the antimicobacterial agents, pathogenetic therapy and anapnotherapy were used, high therapeutic effect was found: suspension of bacterioexcretion was observed in 85 (96.6%) patients and destruction healing – in 76 (81.7%) patients. However, these figures are inferior to outcomes of patients with pulmonary tuberculosis alone – respectively in 176

(97.7%) and 173 (83.5%) cases. However, the rate of suspension of bacterioexcretion and cavern healing in patients with tuberculosis combined with chronic bronchitis is much slower than in patients without it. This is due not only to the late detection of tuberculosis, more massive bacterioexcretion, but to concomitant chronic nonspecific inflammation in the bronchi, which hampers tuberculosis treatment. In view of the aforesaid, such patients should be given longer courses of intensive chemotherapy regimens, and also the special attention should be paid to the quality of follow-up.

In 143 patients with newly detected destructive pulmonary tuberculosis the changes in the bronchial tree were studied when applying the method of fiberoptic bronchoscopy. If tuberculous bronchial lesion was found in 6 (4.2%) patients, the nonspecific changes were detected in 76 (53.1%) patients. Moreover, only 44 (30.8%) were diagnosed with chronic bronchitis, accompanied by cough with sputum production before the tuberculosis in the lungs emerged, which was 17.0% of all newly diagnosed patients with destructive tuberculosis and roughly coincided with the frequency of chronic nonspecific lung disease among all population. In most patients nonspecific endobronchitis was found during fiberoptic bronchoscopy and was characterized with a direct connection with tuberculosis. Only 21 (14.9%) patients disseminated dry rales could be stethoscoped in lungs. In most patients there was asymptomatic course of the diagnosed endobronchitis which was absconded by the manifestations of pulmonary tuberculosis.

By the nature of inflammation in the bronchi the catarrhal bronchitis prevailed in 94 (65.7%) patients, purulent bronchitis prevailed in 40 (28.0%) patients and subatrophic bronchitis – in 9 (6.3%) patients. In half the patients it was bilateral and the intensity of inflammation depended on the prevalence of the specific process in the lungs: in infiltrative tuberculosis it was diagnosed in 70 (49.0%) cases, in disseminated tuberculosis – in 74 (51.7%) and in fibro-cavernous – in 110 (76.9%) cases.

To establish the genesis of endobronchitis 2 groups of patients were analyzed: the first group with endobronchitis (53 patients) and the second group with no changes in the bronchi (47 patients). Age composition and clinical factors in these groups were identical. Smokers were more common in the first group (48.0%) than in the second (10.0%); poor environmental conditions – (17.0%) and (10.0%), – were more often observed, which could contribute to the bronchial shock during the development of tuberculosis.

Differential diagnostic criteria obtained as a result of the studies allowed verifying the genesis of endobronchitis, as shown in Table 2.

Summarizing the outcome of the research, one may state that nonspecific endobronchitis in newly diagnosed patients with pulmonary tuberculosis only in some cases may be associated with smoking and negative impact of polluted environment. The toxic and allergic effect of tuberculous process on the mucosa of the tracheobronchial tree, causing tuberculosis concomitant nonspecific inflammatory process, the so-called reactive “paraspecific” endobronchitis should be considered the main reason.

Table 2: Differential diagnosis of endobronchitis in patients with pulmonary tuberculosis

Characteristics	Paraspecific endobronchitis	Chronic nonspecific endobronchitis
Smoking	Rarely	Frequently
Tuberculosis detection	Often by chance or during fluorography	Often when seeking medical advice
Cough	Appeared recently, Moderate	Persistent, continuous, violent, for more than two years
Sputum	Rarely, mostly Mucoid	Persistent, mucoid, mucopurulent
Dyspnea	Rarely, depending on the pulmonary process	More often, can be unconformable to the pulmonary changes
Dry rales	Rarely	Frequently
Radiographic appearance: - distention of lung roots - pneumosclerosis, emphysema	 Rarely, moderate Rarely	 Evident Frequently
Bronchoscopy findings: - congestion of the mucous membrane - swelling - secretion Outcomes of treatment of underlying disease	Moderate Insignificant Insignificant, mainly mucoid Rapid healing	Evident, with cherry or bluish tint Evident, sometimes plaited mucous membrane Evident, purulent, often mucopurulent Manifestations of exacerbation are of gradual nature

In the process of antimycobacterial therapy endobronchitis was cured with anti-tuberculosis drugs, because the broad-spectrum antibiotics (streptomycin, rifampicin) were also used. However, in some patients the ground for future development of chronic bronchitis that occurs not only in the progression of tuberculosis, but also in clinically cured tuberculosis with the presence of residual changes in the lungs is formed.

4. Conclusions

There are two variants of endobronchitis in destructive pulmonary tuberculosis: nonspecific chronic bronchitis existing before the onset of tuberculous inflammation as an independent nosological form, as well as the so-called reactive "paraspecific" endobronchitis caused by tuberculosis intoxication, irritant and allergic influence of mucus produced from the cavity of breakdown.

Nonspecific chronic bronchitis as independent nosological entity requires long-term, sometimes lifelong medical check-up. Reactive “paraspecific” endobronchitis is usually cured as a result of effective specific chemotherapy and healing of tuberculous process.

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