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MODERN METHOD OF DIFFERENTIAL DIAGNOSIS TUBERCULOSIS AND LUNG CANCER

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Abstract: Tuberculosis and lung cancer as a combined pathology have attracted attention for a long time. Bayle saw carcinomatous consumption among the six different forms of pulmonary consumption. Modern statistics indicate that the incidence of lung cancer in patients with tuberculosis is such that it is impossible not to take into account: active pulmonary tuberculosis is found in 2-5% of patients with lung cancer, and lung cancer - in 1-2% of patients with active pulmonary tuberculosis . At the same time, the pathogenetic relationship between tuberculosis and lung cancer, as well as the causal relationships between them, remain the subject of discussion, which is continued in this work. Lung cancer patients are often misdiagnosed with pulmonary tuberculosis, which leads to delays in making the correct diagnosis and treatment. This is due to factors such as insufficient competence of doctors, inadequate infrastructure and socio-economic conditions in the region. This article outlines the differences between the two diseases, as well as features that would make a clinician suspect a correct diagnosis at an early stage.

Key words: tuberculosis, рак lung cancer, differential diagnosis, course of the disease.

Introduction

It is known that in tuberculosis and other chronic inflammatory processes in the lungs, inflammatory epithelial growths, squamous cell metaplasia and cancer in situ are not uncommon situ, considered as conditio sine qua non malignancy. Meanwhile, from a biological point of view, inflammatory and cancerous epithelial growths are different entities . Even if they remain "precancerous" in terms of their histological differentiation, they do not necessarily turn into cancer; they are, more precisely, "conditionally precancerous" changes. They, inflammatory growths of the epithelium, are correlatively related to the body, in no way possessing the ability to grow cancer cells autonomously. On the other hand, the phenotypic diversity of lung cancers in patients with tuberculosis (their localization in the central and even peripheral parts, histological features, etc.), as well as significant time intervals between the development of both do not allow us to assume that there is a direct pathogenetic relationship between tuberculosis and lung cancer, explaining the higher frequency the incidence of the latter in TB patients compared to the incidence of cancer in the general population. Apparently, we are talking about other, more complex morphogenies of pulmonary pathology, such as cancer or tuberculosis, which makes us consider the widespread point of view about the causal relationship between tuberculosis and lung cancer with a high degree of skepticism. It is difficult to imagine that a cancer that has arisen decades after a previous lung tuberculosis was closely related to it pathogenetically, and, on the contrary, that actively progressive tuberculosis became the cause of lung cancer. Here, as и elsewhere, post hoc non est propter hoc. Obviously, the degree of skepticism with which we have approached the analysis of the link between tuberculosis and lung cancer is quite justified from a biological point of view. Further research will show in which direction-increase or decrease-this share will change.

Tuberculosis continues to be the leading cause of morbidity and mortality worldwide. There are 8.8 million cases of tuberculosis worldwide every year. While 1.61 million people worldwide are diagnosed with lung cancer. In some countries, there is a growing number of hospitalizations to tuberculosis hospitals for patients with malignant lung diseases, which makes it difficult to accurately diagnose tuberculosis and malignancies. There are many similarities between these two diseases, they are both common, involve the lung parenchyma and, above all, are characterized by similar symptoms. But there are also many differences between these two nosologies: different etiologies (pulmonary tuberculosis is an infectious disease, while cancer is a non - infectious neoplastic disease), consequences, and generally different patient management. Delay in the diagnosis and treatment of lung cancer leads to a worse outcome and lower survival. Tuberculosis is caused by infection of the lungs with the small aerobic immobile bacillus Mycobacterium tuberculosis (MBT). It is spread through the air when people with an active infection cough, sneeze, or otherwise transmit the voevoditel to the environment. Lung cancer is an etiologically complex disease in which several genes are involved in pathogenesis in different ways When these genes interact with environmental factors, a person can develop lung cancer.

There are some common risk factors, such as smoking, that are common to both tuberculosis and lung cancer. Smoking can contribute to the manifestation or harmful effects of tuberculosis through various mechanisms. First, because smokers tend to have a chronic cough, which is also a hallmark symptom of tuberculosis. Diagnosis of tuberculosis may be delayed, leading to further progression of the disease, a worse prognosis, and possibly a higher probability of death. Secondly, smoking is the cause of concomitant diseases, such as chronic bronchitis, chronic airway obstruction, emphysema of the lungs, as well as coronary heart disease, which can contribute not only to the progression of the tuberculosis process, but also to the deterioration of the functional ability of the lung tissue. Third, iron overload of macrophages in lung tissue is discussed as a direct effect that impairs the cellular response to microorganisms. Finally, it can be assumed that smokers are less likely to stick to therapy. Cigarette smoking is the most important risk factor for lung cancer. In patients with this pathology, active tobacco smoking in the anamnesis is present in 87% of men and in 85% of women.

There is a 10-fold increased risk of lung cancer in smokers and a 20-fold risk in heavy smokers (>20 cig/day). Other risk factors for developing pulmonary tuberculosis include: contact with patients with an open form of tuberculosis, immunocompromised status (e.g. HIV infection, cancer, organ transplants and long-term high-dose corticosteroid therapy), substance abuse (intravenous or injecting drug users and alcoholics), marginalized groups without adequate medical care (homeless people), institutionalization (e.g. long-term care facilities, psychiatric hospitals, prisons), occupational risk factors (medical professionals). Risk factors for lung cancer: secondhand smoke, exposure to certain metals (chromium, cadmium, arsenic), certain organic chemicals, radiation, air pollution, atmospheric and occupational agents known as carcinogens: radon, asbestos, arsenic, bichloromethyl ether, chromium, nickel, polycyclic aromatic compounds, certain viruses (HPV, etc. CMV), a burdened family history.

Cytogenetic studies have revealed many chromosomal changes in lung cancer with numerical anomalies and structural aberrations, including deletions and translocations. Small cell lung cancer is associated with oncogenes such as c-myc, L-myc, N-myc, c-raf and tumor suppressor genes such as p53 and Rb. Non-small cell lung cancer is associated with K-ras, N-ras, H-ras, c-myc,c-raf, and tumor suppressor genes such as the p16 and Rbgenes. Clinical features. Lung tuberculosis and lung cancer share common symptoms: coughing, coughing up blood, fever, weight loss, and shortness of breath. However, a thorough medical history and examination may help the clinician suspect lung cancer. Coughing is by far the most common symptom in lung cancer, and any " new " cough that persists for more than two weeks in patients over the age of 40 who smoke cigarettes should be considered a suspected lung cancer.

Hemoptysis, which usually manifests as streaks of blood in the sputum, is an alarming symptom

that should always be thoroughly investigated. Fever in tuberculosis is mild and has evening rises, while in lung cancer there are no such specific signs. If there is sudden weight loss, it indicates malignancy, while tuberculosis is characterized by gradual weight loss.

The most common symptoms of lung cancer are a change in the nature of a chronic cough (cough that does not go away), hemoptysis, shortness of breath, hoarseness of voice, chest pain (which increases with deep breathing), unexplained weight loss and loss of appetite, persistent pneumonia, and superior vena cava syndrome (localized swelling of the face and upper extremities, fullness of the face swelling of the neck and chest veins). Shortness of breath can occur due to narrowing of the airways or due to partial or complete collapse of the distal segment of the lung. These symptoms usually occur with centrally located neoplasms, while peripheral neoplasms may not cause respiratory symptoms. Sometimes hoarseness of the voice is the only complaint, and this is due to paralysis of the vocal cords due to damage to the left recurrent laryngeal nerve. When these patients are asked to cough, they produce a relatively ineffective exhalation noise, the so-called "bull cough", devoid of the explosive quality of a normal cough. In lung cancer, the spread of metastases is most often lymphogenic and the first usually involved are the cervical and supraclavicular lymph nodes. Approximately 1/3 of patients with lung cancer present with symptoms due to metastatic spread. They can manifest as bone pain or even pathological fractures. Cerebral metastasis may be accompanied by progressive neurological symptoms.

These symptoms can also be present in the case of tuberculosis, as well as in cases of spinal damage. Diagnosis of tuberculosis and lung cancer can be difficult, since the symptoms of these diseases have a similar clinical picture at certain stages. Currently, since the incidence of tuberculosis in the elderly tends to increase due to an increase in the immune-compromised status (diabetes, HIV, etc.), and lung cancer is not uncommon in young people, the patient's age is no longer a guideline in differential diagnosis .

However, the diagnosis of lung cancer in patients with tuberculosis or with residual phenomena of tuberculosis has some features. It depends on the variety of clinical symptoms, clinical course, and location of the cancer. A proper clinical examination is necessary to make a correct diagnosis. Radiological methods. In chest radiography, tuberculosis can manifest itself in the form of 5 main syndromes: parenchymal lesion, lymphadenopathy, miliary disease (evenly distributed diffuse nodules 2-3 mm in size with a slight predominance in the lower lobe), pleural effusion and cavitation. Parenchymal lesions are characterized by dense, homogeneous or heterogeneous consolidation of the parenchyma in any lobe (mainly in the upper lobe) and fibrous changes.

Malignant lesions have irregular edges with radiating strands. Lung cancer can also manifest as a hilar prominence (in the case of central tumors), a pulmonary node (in the case of peripheral tumors), and mediastinal dilation (suggestive of spreading to the lymph nodes), complete or partial atelectasis of the segment, lobe or lung (mechanical impact causing obstructive collapse), insoluble consolidation (pneumonia), cavitation (eccentric, irregular edge with nodularity), increased dome of the diaphragm (caused by paralysis of the phrenic nerve), pleural effusion. Other results include rib erosion in 4.8% and lymphangitis in 2.8%.

A normal chest X-ray is found in 0.4% of lung cancer cases. A CT scan is often the second step, either to monitor for an abnormal chest X-ray or to assess symptoms in patients with a normal chest X-ray. Central lobular density in and around the small airways and the appearance of a" tree in the kidney " were the most characteristic signs of CT of pulmonary tuberculosis. This is the best non-invasive method for diagnosing lung cancer. Computed tomography has many features that make it possible to assume the diagnosis of lung cancer: Size – the larger the nodule, the more likely it is to be malignant. Edges-Lung cancer has irregular edges. This feature cannot be used to rule out lung cancer, as about 20% of malignant nodules have smooth edges. In addition, tuberculosis in the lungs can be a nodule [5,6]. Internal morphology is unreliable in

determining lung cancer. Growth-Lung cancer usually doubles in volume (a 26% increase in diameter) between 30 and 400 days (an average of 240 days). Using a CT scan of the chest can improve the accuracy of growth assessment. It has been reported that growth can be detected in lung cancers up to 5 mm in size by repeated CT scans within 30 days. CT scans can very well assess the size of a lymph node, but cannot distinguish between tumorous and reactive lymph nodes.

For histological diagnosis, you can take a CT-directed fine-needle aspiration biopsy. Sputum examination. Sputum smear staining is the most widely used diagnostic method for active tuberculosis. The test is based on the high content of lipids in the cell wall of mycobacteria, which makes them resistant to acid alcohol discoloration after primary staining. Its advantage is that it is inexpensive, fast, and specific. The lead time is usually less than 2 hours. Sputum culture is the gold standard for laboratory diagnosis of tuberculosis. Its most important advantage is the test for susceptibility to tuberculostatics and identification of the organism to the species level, the disadvantage is the very slow growth of Mycobacterium tuberculosis for several weeks, which delays treatment. Diagnosis of lung cancer by examining samples of induced sputum for the presence of malignant cells can be a valuable alternative to diagnosis by bronchoscopy. Sputum cytology has many advantages over other methods used to diagnose lung cancer, as it is fast, devoid of any injuries, and non-invasive and, most likely, it will give positive results in the case of centrally located cancers.

The best advantage is that it provides cytological diagnostics, which is important for making decisions about the treatment of lung cancer. Bronchoscopy is an important method for diagnosing both pulmonary tuberculosis and lung cancer. Bronchoscopy is indicated for tuberculosis, in which the cough is unproductive or the smear test is negative. Different results in the case of tuberculosis during bronchoscopy include granulomatous ulcer (the most common), single ulcer, hyperplastic lesion (including tuberculoma), and fibrostenotic lesions. Performing fibrooptic bronchoscopy (PHB) and examining materials obtained by bronchoscopy using the traditional method of smear diagnosis, mycobacterium culture, and histopathology is useful in diagnosing sputum smear negative for pulmonary tuberculosis.

The use of molecular methods such as polymerase chain reaction (PCR) is an adjunct to confirming the diagnosis of tuberculosis in an individual patient in an appropriate clinical setting. In developed countries that do not have limited resources/diagnostic tools, early use of PHOBOS is the best course of action for a patient with a sputum smear negative for pulmonary tuberculosis. Bronchoscopy is the most effective method for diagnosing lung cancer, as it can examine the entire tracheobronchial tree, as well as provide histological confirmation. Various abnormalities include growth, altered mucosa with areas of inflammation, light bleeding, granularity, nodularity in the area of bronchial stenosis. Bronchoscopy also helps to determine the operability of the tumor, since it is limited to the lobar bronchus, can be removed by lobectomy, but if it is located within 1 cm from the crest of the trachea, then the operation of choice is pneumonectomy. With the help of bronchoscopy, we can get a bronchoalveolar lavage (fluid is injected into a small part of the lung and then aspirated for examination), perform a transbronchial biopsy (a small piece of tissue is extracted using biopsy forceps and sent for histopathological examination), and a transbronchial aspiration with a needle (done in cases of larger lesions when using a transbronchial needle). the tissue material is aspirated and sent for examination). A bronchial brush biopsy is also performed.

Smears of the bronchial brush are taken near the site of the tumor, a slide is made and sent for examination. The enzyme-linked immunosorbent assay (ELISA) for tuberculosis is an unreliable test for diagnosing pulmonary tuberculosis. Detection of antibodies by this method for the diagnosis of pulmonary tuberculosis is of limited use, since less than 70% of patients produce specific antibodies in high levels . The test has a sensitivity of 50% to 92% and a specificity of 95% . Limitations of the test: presence of antibodies to M. tuberculosis it is not unambiguous

evidence of an active disease. People who have previously been exposed to mycobacteria, and those who live in a high-spread area, show positive results. In patients with an active disease, there is a wide variability in the antibody response.

The effect of TB treatment on antibody levels is controversial. Different laboratories use different mycobacterial antigens, such as glycolipids from BCG, antigens 5 and 6 from M. tuberculosis, BCG protein 64kDaκ , M. tuberculosis protein 12 kDa, and antigen 60 (A60). Thus, there are large differences in ELISA results from the same sample, so it cannot be recommended for differential diagnosis of pulmonary tuberculosis and lung cancer.

Conclusion.

A missed or incorrect diagnosis of lung cancer can lead to delays in treatment, inadequate therapy, or no treatment at all. According to studies, late diagnosis of lung cancer was significantly higher in patients who received TB treatment compared to those who did not receive specific therapy [9]. An additional worrying fact is that only a small proportion of these patients have a definitive microbiological diagnosis of tuberculosis. In general, this leads to delayed diagnosis and progression of the disease. This indicates that lung cancer is often misdiagnosed as pulmonary tuberculosis, and these patients are presumably given ATT, resulting in a significant delay in cancer diagnosis. Most lung cancers (> 80%) are diagnosed at a late stage, by which time they are beyond the possibility of therapeutic resection. Attempts should be made to minimize this delay period by maintaining a high index of suspicion, a low referral threshold, and aggressive, as well as appropriate research and prompt initiation of treatment. This is a serious concern, as early diagnosis of lung cancer can increase the likelihood of resectability of the tumor, and timely chemo-radiation therapy can provide a better quality of life. If clinicians, including general practitioners, are aware of the predisposing factors and symptoms of bronchogenic carcinoma, this can lead to an early diagnosis of lung cancer and improve treatment outcomes in patients suffering from this terrible disease. The text of the article with the included illustrative material (font 14 Times New Roman, at 1.5 intervals, the text is aligned in width with paragraph indents of 1 cm), the inclusion of tables and figures is desirable, links to tables, figures and headings to them are mandatory. References to bibliographic sources should be given in the text in square brackets, and not in the form of footnotes.

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