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Modern Features of Epidemiology, Diagnosis and Clinical Course of Skin Tuberculosis

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Abstract

The article describes the modern features of the course, diagnosis of skin tuberculosis, also describes some of the observed clinical cases.
Skin tuberculosis remains an important, though relatively uncommon, form of extrapulmonary tuberculosis. Its epidemiological characteristics have evolved in recent years, with increased incidence in immunocompromised populations, particularly among individuals with HIV infection and those receiving immunosuppressive therapies. The disease presents with diverse clinical manifestations, including lupus vulgaris, scrofuloderma, tuberculous chancre, and tuberculosis verrucosa cutis, often mimicking other dermatological conditions, which complicates timely diagnosis. Modern diagnostic methods, especially molecular techniques such as polymerase chain reaction (PCR), alongside traditional histopathological examination, have significantly improved the accuracy and efficiency of detection. The clinical course of skin tuberculosis varies depending on the patient's immune status, ranging from chronic indolent lesions to acute, rapidly progressing forms. Early recognition and appropriate management are crucial to prevent complications and disfigurement. This review highlights the contemporary epidemiological trends, diagnostic advancements, and clinical features of skin tuberculosis, underscoring the need for heightened clinical vigilance and integration of modern diagnostic tools in routine practice.
Keywords: skin tuberculosis, tuberculosis, epidemiology, diagnostics

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Новое в эпидемиологии, диагностике и клиническом течении туберкулеза кожи

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Резюме

В статье описываются современные особенности течения, диагностики туберкулеза кожи, а также собственные клинические наблюдения.
Кожный туберкулез остается важной, хотя и относительно редкой, формой внелегочного туберкулеза. Его эпидемиологические характеристики изменились в последние годы с увеличением заболеваемости среди иммунокомпрометированных групп населения, особенно у лиц, инфицированных ВИЧ, и пациентов, получающих иммуносупрессивную терапию. Заболевание характеризуется разнообразными клиническими проявлениями, включая волчаночный туберкулез (lupus vulgaris), скрофулодерму, туберкулезный шанкр и бородавчатый туберкулез кожи (tuberculosis verrucosa cutis), часто имитируя другие дерматологические заболевания, что затрудняет своевременную диагностику. Современные диагностические методы, особенно молекулярные технологии, такие как полимеразная цепная реакция (ПЦР), наряду с традиционным гистопатологическим исследованием, значительно повысили точность и оперативность выявления заболевания. Клиническое течение кожного туберкулеза варьирует в зависимости от состояния иммунной системы пациента – от хронических вялотекущих поражений до острых, быстро прогрессирующих форм. Раннее выявление и своевременное лечение имеют решающее значение для предотвращения осложнений. В данном обзоре освещаются современные эпидемиологические тенденции, диагностические достижения и клинические особенности кожного туберкулеза, подчеркивается необходимость повышения клинической настороженности и интеграции современных диагностических технологий в повседневную медицинскую практику.
Ключевые слова: туберкулез кожи, туберкулез, эпидемиология, диагностика

Tuberculosis of the skin is a rare localization of tuberculosis and ranks 5th among other forms, not exceeding 1–2% of VLT [1–3].

Today, experts talk about the revival of the TC problem, since, apparently, the real number of cases is much higher, which is due to insufficient awareness of primary care physicians with the epidemiology of TC, with the clinical pathomorphosis of skin manifestations, as well as with the incomplete use of diagnostic tests [4–6].

Modern classifications of tuberculosis of the skin differ from the generally accepted clinical division into limited and disseminated forms. TC is characterized by significant

polymorphism. Tuberculous lupus, papulonecrotic, warty tuberculosis and other forms often occur under the guise of nonspecific dermatoses, remaining unrecognized for a long time. Atypical, complicated forms, combinations of several variants (tuberculous lupus + papulonecrotic TB, lichenoid and papulonecrotic TB in one patient, etc.) are increasingly described.

It is known that TB often develops secondarily with hemato- and lymphogenous spread of MBT from foci of different localization. It should also be remembered that TB can develop not only with active TB, but also in people who have previously been ill or operated on for TB, with activation of latent infection and exogenously.

In practical dermatology, new diagnostic technologies are rarely used in TB examination, usually limited to the Mantoux test and chest X-ray. Modern laboratory diagnostics of tuberculosis is aimed not only at identifying MBT, but also at their species identification and drug sensitivity [7, 8].

Currently, immunological methods are used without fail, including the Mantoux tuberculin test, which has not lost its significance, as well as tests for the detection of INF-gamma secretion by blood mononuclear cells during interaction with MBT proteins. The second group of methods is microbiological, aimed at identifying MBT in substrates – these are microscopic and cultural diagnostics and molecular genetic methods. And finally, the third group is morphological detection of MBT in biopsies [9].

The most frequently used microscopy of smears with Ziehl-Neelsen staining is a simple and inexpensive method. More modern fluorescent and LED microscopy are more effective, but also more expensive, unfortunately, not available to primary health care [10].

The gold standard for diagnosing mycobacterium tuberculosis is bacteriological culture on two media – solid and liquid, which generally increases the detection of MBT by 30–50%. Automated MBT detection systems Baktek 960 are used in world practice [11].

The purpose of the study is to show modern clinical and diagnostic aspects of some pathogenetic factors of tuberculosis of the skin and the effectiveness of its treatment.

To confirm the diagnosis of TC, along with generally accepted tuberculin tests, we used the Diaskin test and the Xregt MBT molecular genetic research kit in the examination complex [12].

We observed 192 patients with different forms of tuberculosis who had concomitant skin diseases, including 18 with tuberculosis of the skin. The examination was carried out in accordance with the standards adopted in dermatology and phthisiology.

Secondary scrofuloderma was most often noted – in 10 patients, papulonecrotic – in 3, less often diagnosed were tuberculous lupus and warty TC and indurative erythema. TC was established both in children and adults. TC was more often combined with Tuberculosis of the lymph nodes, less often with TL and Tuberculosis of bones and joints.

We observed a case of tuberculous lupus. With positive results of the Diaskin test, in which, upon further examination, tuberculosis of the lymph nodes was detected. Objectively: The skin-pathological process is widespread, localized on the skin of the face, forearms, hands, the lesion element is brown tubercles of dense elastic consistency up to 1 cm in size, positive Pospepelogo symptom. Currently, the patient is receiving treatment at the Institute of Phthisiology (Fig. 1). We also observed 3 cases of papulonecrotic tuberculosis in 2 men and a teenage girl. Objectively: The skin pathological process is widespread, localized on the skin of the shin, the element of the lesion is papules up to 1 cm in size, bluish tint, in places there are stamped scars. In all cases, a long history of the

Fig. 1. Tuberculous rash in a patient with tuberculous lupus

Fig. 2. Stamped scars in a patient with papulonecrotic tuberculosis

Fig. 3. Papulonecrotic rash on the face

Fig. 4. Papular rash with a bluish tint, scars in places

Fig. 5. Tuberculous rash on the skin of the forearms

Fig. 6. Ulcer with undermined edges on the skin of the shin

disease was noted, diagnosed as lichen planus and acne vulgaris. In one case, PNT was combined with TCIS, in two – TVGLU (Fig. 2, 3).

PNTc was diagnosed in a 15-year-old girl a year after her first visit with complaints of rashes. The patient had been treated for LP without results. Objective: The skin-pathological process is limited in nature, localized on the skin of the face, upper eyelid of the left eye, the lesion element is purple papules measuring 0.2–0.5 mm. During examination, the Diaskin test is positive, upon further examination, TVGLU was established (Fig. 4). We diagnosed warty tuberculosis in two patients, also with a long history and periodic treatment in the skin and venereal diseases department with diagnoses of LP, pruritus. Objective: The skin-pathological process is widespread, symmetrical in nature, localized on the skin of the forearms of the extensor surface, on the skin of the dorsal surface of the hands, the lesion element is flesh-colored papules on the surface of slight peeling. During examination, the Mantoux test and Diaskin are positive, TB is detected. They receive specific treatment, with good dynamics of the skin and underlying process (Fig. 5).

A patient with multiple concomitant diseases of the cardiovascular system, cerebral circulation, myocarditis, pleurisy, COPD, fatty hepatosis, varicose symptom complex has had a pathological process on the shin for several months, initially assessed as erysipelas, thrombophlebitis, subsequently a deep ulcer with undermined edges formed. In the past, she received treatment for tuberculosis of the respiratory organs.

Objective: The skin pathological process is limited in nature, localized on the skin of the shin of the right leg. The lesion is an ulcer with undermined edges up to 3–4 cm in size. Peripheral lymph nodes are enlarged to the size of a pea.

Scrofuloderma was in 2 adult patients with TB and tuberculous spondylitis. A child with BCG lymphadenitis, who received treatment at the place of residence for a long time for 5–6 months from a pediatrician for the diagnosis of deep ulcerative pyoderma (Fig. 6).

It is known that TC occurs rarely due to the peculiarities of the protective function of the skin, the stability of its epidermal barrier. In patients, TC develops in conditions of comorbidity with cardiovascular, hepatic endocrine pathology. Violation of the lipid spectrum of the blood, hypercholesterolemia, dyslipidemia, hypertriglyceridemia is noted. Also, a violation of the ratio of normal microflora in both qualitative and quantitative terms is noted. The proportion of pathogenic strains of staphylococcus increases, microorganisms appear that are not characteristic of the skin biotope. The degree of colonization increases significantly. These circumstances indicate a decrease in the bactericidal activity of the skin, can be considered a factor in the development of TC and should be taken into account in complex therapy. In the treatment of TC, general tuberculosis therapy regimens are used. It is known that anti-tuberculosis drugs have hepatotropic properties, a high percentage of side effects is noted, which are especially dangerous in patients with comorbid pathology, with a high cardiovascular risk, an atherogenic profile. In this regard, it is advisable to include drugs with a pleiotropic effect in the treatment of patients with all forms of tuberculosis, as well as patients with dermatoses against the background of concomitant polymorbidity – immunomodulators, antioxidants, detoxifiers, hepatoprotectors. Glutathione preparations have such properties. We prescribed neomarin to patients, externally applied ointments with a polycomponent effect containing antibiotics, antifungal, anti-inflammatory substances. During the treatment, positive dynamics of clinical symptoms were noted.

Thus:

- In the structure of skin pathology in patients with tuberculosis TL and VLT, specific manifestations of TC make up 9.2% and are represented mainly by colliquative, less often – papulonecrotic, lupoid and indurative TC. Characterized by a long atypical course, clinical similarity with non-specific dermatoses, late diagnosis of TC.
- In all cases, endogenous infection was noted as a result of lympho-hematogenous spread of MBT from foci of TC and S, TPLU, TVGLU and TL, more often against the background of active tuberculosis. The clinical diagnosis of TC was verified by positive immunological (Mantoux test 2TE in 88.9%, Diaskin test in 100%), as well as microscopic, cultural, histological and molecular genetic (GeneXPert MBT / RIF) tests.
- Patients with TC have multiple concomitant diseases of the cardiovascular, gastrointestinal, hepatobiliary systems, diabetes mellitus type 2, dyslipidemia, hypercholesterolemia. Metabolic disorders in the body affect the functional state of the epidermal barrier of the skin, contribute to the development of dysbacteriosis, increase the susceptibility of the skin to MBT with the formation of specific inflammation.
- Complex therapy of TC is effective when prescribing anti-tuberculosis drugs in combination with multifunctional agents of antioxidant, detoxifying, immuno-hepatotropic action (glutathione) and local use of multicomponent drugs that correct the skin microbiocenosis (thymogel, mupiroban, neoderm, etc.).
- More than half of the patients with TC in our studies were identified when visiting dermatological departments using a set of laboratory tests, which confirms the need to increase the alertness of primary care physicians regarding TC.

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