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Clinical signs of skin tuberculosis

Skin tuberculosis is a form of extrapulmonary tuberculosis, which is rare and differs from other well-known forms of tuberculosis in skin manifestations. Family doctors, even phthisiatricians and sometimes pulmonologists (to whom persons with pulmonary pathology of tuberculous genesis will turn) in their practice will see them perhaps several times a year since pulmonary forms are often accompanied by the presence of extra-pulmonary forms. Today, this is an important issue, especially given the increase in the detection rate of extrapulmonary forms, which is also caused by the growing rate of co-infection with TB and HIV/AIDS or HIV/AIDS alone, the frequency of which is constantly increasing.

The above-mentioned specialists should be able to identify and confirm such a diagnosis in a patient. Still, there are difficulties in diagnosing skin tuberculosis, since often the manifestations of the disease are atypical, and it is mostly impossible to detect mycobacteria of tuberculosis using available methods. In addition, there are no clear histological and morphological signs of skin tuberculosis, and a certain role is also played by the lack of awareness of general practitioners regarding the manifestations of this pathology. Therefore, to help general practitioners, the review we offer covers the most common forms.

The authors hope that the presented review of clinical manifestations of skin tuberculosis forms will help general practitioners (and specialists) to study this rather rare pathology better, detect it in patients in a timely manner and, consequently, start treatment earlier, which will contribute to achieving a faster and more effective result.

Keywords

Skin tuberculosis, extrapulmonary tuberculosis, clinical manifestations of skin tuberculosis.

The incidence of active tuberculosis in combination with the disease caused by the human immunodeficiency virus in 2023 year increased by 5.1 % compared to 2022 and is 8.2 per 100,000 population (3.350 cases of TB/HIV in 2023 year. versus 3,191 in 2022 year) and in general, the incidence of extrapulmonary forms also increased: in 2022, extrapulmonary tuberculosis amounted to 1.562 cases (8.4 %), and in 2023 — 1.756 cases (8.8 %) [4].

Skin tuberculosis is one of the manifestations of tuberculosis disease of the body and is caused by mycobacteria tuberculosis of both human (*Mycobacterium tuberculosis*) and bovine species (*Mycobacterium bovis*). Tuberculous skin lesions are a rather rare phenomenon, its share in the structure of tuberculosis incidence is less than 0.1 % [1, 2, 6].

Skin tuberculosis occurs against the background of reduced immunological state of the body; spreads mainly endogenously (hematogenous or lymphohematogenous) from other foci of tuberculosis infection in the body (lungs, lymph nodes, etc.) may be combined with other localizations of the tuberculous process [2, 5].

Forms of skin tuberculosis include various pathological processes with different clinical presentations, the diagnosis of which is based on clinical manifestations, results of radiological examination, histology of the biopsy specimen, determination of tuberculin allergy, as well as the effectiveness of test therapy [3, 6].

Skin tuberculosis manifests itself in various clinical manifestations, among which there are: limited (primary tuberculosis complex, tuberculous lupus, colliquative skin tuberculosis, warty skin tuberculosis, ulcerative skin tuberculosis) and widespread (papulonecrotic skin tuberculosis, compacted skin tuberculosis, miliary skin tuberculosis, lichenoid skin tuberculosis) forms of skin tuberculosis.

Colliquative skin tuberculosis (scrofuloderma): the lateral surfaces of the neck are most often affected. The rash initially appears as dense painless nodules, which quickly increase in size, turning into a node tightly fused with the underlying tissues. The skin over it acquires a bluish tint. Over time, the node softens and opens, releasing purulent contents with necrotic inclusions. An ulcer with soft edges,

a yellowish coating and sluggish granulations at the bottom is formed at the site of the node. After its healing, characteristic torn scars of irregular shape remain, covered with papillary skin outgrowths and bridges, the disease occurs mainly in women.

Papulonecrotic tuberculosis of the skin is more common in women aged 16 to 40, although the disease also occurs in older people, the elderly and children. People whose work involves prolonged standing are at increased risk. This form of skin tuberculosis is characterized by hemispherical papules the size of a hemp seed, reddish in color with a bluish tint, and of a dense consistency. Necrosis occurs in the central part of the papule. Necrotic masses dry out into a dense crust that is tightly held on the skin. After its removal, a round ulcer with sharp edges is formed. After the ulcer heals, a characteristic depressed, or «stamped», scar remains. The scar itself and the surrounding skin are hyperpigmented, but depigmentation occurs over time. The evolution of an individual papule lasts about a month. Papulonecrotic tuberculosis of the skin can affect any area of the skin, but the most common locations are the shins, buttocks, thighs, forearms, and shoulders. Rashes are usually grouped around the joints on the extensor surfaces of the limbs. The course of the disease is chronic, with worsening in winter and improvement in the warm season, although exacerbations are possible in summer due to excessive insolation. Tuberculin tests give a positive result, but mycobacteria of tuberculosis are detected only in rare cases. During the exacerbation period, signs of intoxication may appear: increased body temperature, weakness, pain in the joints. The prognosis is favorable, the primary focus (in the lungs, lymph nodes, bones or joints) is usually inactive. Between exacerbations, the general condition of patients usually does not change.

Compacted erythema (Bazen's erythema, indurative skin tuberculosis). This is one of the most common forms of skin tuberculosis. The basis of the disease is dermohypodermal allergic vasculitis, caused by increased sensitivity to mycobacteria, which mainly enter the skin by hematogenous route. The disease mainly develops in girls and young women suffering from peripheral circulatory disorders, hormonal dysfunctions, especially hypofunction of the gonads. A provoking factor is prolonged standing. Indurative erythema of Bazen is manifested by nodes located in the subcutaneous fat of the lower legs. The skin over them is reddened. Women with low-active tuberculosis of the lymph nodes are most often affected. The nodes can resolve on their own in the summer and recur in the spring and autumn. The size of the nodes usually reaches the size of a cherry or a small plum, less often — a chicken egg. In some patients, a flat infiltrate is palpated, at the beginning, a granulomatous, nonspecific, lymphocytic-plasmacytic inflammatory reaction is observed, significant vascular changes with edema and proliferation of the endothelium, thrombosis and obliteration of vascular lumens. Over time (after 1.5—2 months), a specific granulomatous reaction is formed. Caseosis is not always found. Deep biopsy is important for diagnosis, since the main process develops in the subcutaneous tissue. The prognosis is favorable, but even with adequate treatment, the disease regresses slowly. Late relapses are possible, sometimes several years after clinical recovery. The course of the disease is long. Ulceration of the seals is rarely observed, which is resistant to therapy.

Goldenseal lichen (lichenoid tuberculosis of the skin) — very rare form of skin tuberculosis, which usually develops in the primary period of the disease, mainly in weakened children and adolescents suffering from other forms of tuberculosis (skin, lymph nodes, bones or, less often, lungs). The development of the disease can be provoked by acute infections (measles, whooping cough, influenza, etc.), tuberculin test or BCG vaccination. The rash is represented by lichenoid, follicular or perifollicular elements of a conical or flat shape, rounded, less often polygonal shape. Their surface is often covered with horny scales or penetrated by vellus hair. They are located symmetrically, mainly on the lateral surfaces of the body. The color of the elements varies from yellowish-brown to reddish or pale pink. Due to the grouping and dense arrangement of the rash, oval or ring-shaped lesions can form. Less commonly, erythematous rashes, infiltrative foci or elements that progress to papulonecrotic tuberculosis, or their combinations are observed. After the regression of the rashes, superficial scars may remain. The course of the disease is chronic. The prognosis is favorable due to the tendency to self-regression within a few weeks or a rapid effect of treatment, although relapses are possible, most often in autumn and spring.

Rosacea-like tuberculid of Lewandowski. It is characterized by the appearance on the face of isolated miliary painless papules of yellowish-red color of soft consistency, similar to acne. During diascopy, a symptom of «apple jelly» is detected. The elements are at different stages of development, and after regression, scars remain. Tuberculin tests are weakly positive or negative. Some authors consider this form of tuberculosis to be a type of papulonecrotic tuberculosis.

Tuberculous lupus (Lupus vulgaris) is the most common form of skin tuberculosis. The pathogen enters the skin mainly by lymphogenous or hematogenous route from other foci of tuberculosis infection (lungs, lymph nodes, etc.) It is often accompanied by

tuberculosis of the peripheral lymph nodes (97 %) and bone and joint tuberculosis (30 %). The main morphological element is a tubercle (lupoma), which is an infectious granuloma. Their diameter is 2—7 mm, the consistency is dense-elastic, palpation is painless. The tubercles are prone to peripheral growth, merging into continuous foci and the formation of ulcers. Their feature is the formation of a thin, smooth scar or cicatricial atrophy of the skin after resorption. During diascopy, the brown-pink color of the tubercles disappears, and due to anemia of the pathological area, yellowish-brown infiltrates («apple jelly») are visible. When pressed with a probe, it easily penetrates the lupoma tissue (probe phenomenon).

Forms of tuberculous lupus: plane, ulcerative, psoriatic, tumor-like, serpiginous, warty, disseminated. A combination of several forms (most often flat and ulcerative) in one patient is possible. Rashes are localized mainly on the face, but can affect the trunk and limbs. The mucous membranes of the nasal and oral cavities are often affected. The disease is more often registered in women. Sometimes it develops after BCG vaccination or after some time at the site of the post-vaccination scar. The course of the disease is long, sluggish, but benign. Tuberculous lupus usually occurs against the background of a normergic reaction to the Mantoux test with 2 TU.

Plane form — the most common form, in which individual tubercles merge, forming a lesion. It gradually increases due to the appearance of new tubercles on the periphery.

Ulcerative form — develops as a result of ulceration of tubercles. Ulcers are usually superficial, bleed easily, sometimes covered with a small amount of purulent discharge.

Psoriatic form — resembles a psoriatic plaque. It is characterized by the presence of silver-white scales on the surface of the affected areas.

Tumor-like form — occurs as a result of the merger of large tubercles into a dense infiltrative conglomerate, resembling a dark brown tumor. At the same time, all the typical signs of tuberculous tubercles are preserved: doughy consistency, the symptom of «apple jelly» and «probe sinking». Features of damage to the mucous membranes in tuberculous lupus. Tuberculous lupus affects the mucous membranes in 70 % of cases. The mucous membranes of the nasal cavity and mouth (gums, hard and soft palate, pharynx, lips, etc.) are most often affected. Small grayish-reddish tubercles appear on the mucosa, which merge, forming plaques with an uneven surface. Later, they disintegrate with the formation of ulcers. Characteristics of ulcers: Uneven, finely scalloped edges without undermining. Surrounded by an inflammatory rim, on which young tubercles are visible. The bottom of the ulcer has a granular appearance, often covered with a yellowish-gray coating and bleeds easily. With deep spread of the process, cartilage and bones can be affected, which leads to facial deformation (nose, lips, jaw, eyelids, ears). Gum disease with the involvement of the alveolar process can cause exposure or loss of teeth.

Serpiginous form. Characterized by the spread of the lesion to neighboring healthy areas. Scars form at the site of regressed lesions, around which new lupomas appear.

Warty (verrucous) form. Characterized by warty growths on the surface of the lesions. Most often localized on the hands and feet. Complications and features of the course. Ordinary tuberculous lupus always ends with the formation of a scar. With relapses, new lupomas may appear on the scars. The most severe complication is lupus carcinoma — malignant transformation into squamous cell carcinoma, which has a more severe course compared to ordinary forms of this cancer. This complication usually occurs due to irrational treatment, in particular radiation therapy.

Exfoliative form of tuberculous lupus. This form is characterized by the appearance of confluent, small, superficial lesions covered with whitish scales that fit tightly together. Because of this, the rash resembles discoid lupus erythematosus. It is most often located on the face in the form of a «butterfly».

Miliary-ulcerative tuberculosis of the skin. A rare form of cutaneous tuberculosis. It is characterized by the appearance of soft, small pink-brown nodules, most often on the face. The nodules may ulcerate, heal with scarring, or resolve without ulceration [2, 3, 6].

Forms of skin tuberculosis caused by non-pathogenic MBT, which can also occur in our country, for example in professional (or non-) swimmers and travelers.

Granuloma of swimmers. A rare form that has a long but self-limiting course. Usually caused by *Mycobacterium marinum*, which enters the body while swimming in infected bodies of water or through manipulations with pools. Less common lesions are caused by *M. ulcerans* and *M. kansasii*. Clinical manifestations: Reddish bumps that gradually increase in size and become purplish. Most often located on the upper limbs or knees. Granulomas usually heal spontaneously.

Buruli ulcer. Caused by *Mycobacterium ulcerans* and common in more than 30 tropical and subtropical countries, especially in West and Central Africa. It begins as a painless subcutaneous nodule, a large painless area of induration, or diffuse painless swelling of the legs, arms, or face. The infection progresses, causing significant destruction of the skin and soft tissues; large ulcers may form on the

legs or arms. Healing may result in severe contractures, scarring, and deformity [5, 6].

Conclusions

The team of authors hopes that the provided overview of the clinical manifestations of types of skin tuberculosis will help general practitioners (also specialists) better navigate this rather rare pathology and will help to detect it in a patient more timely and qualitatively and thus begin treatment earlier, which will accordingly lead to a faster and more successful result.

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Клінічні ознаки туберкульозу шкіри

Туберкульоз шкіри — форма позалегеневого туберкульозу, яку виявляють досить рідко. Вона відрізняється від інших добре вивчених форм захворювання шкірними проявами. Крім того, сімейні лікарі та навіть фтизіатри, а інколи і пульмонологи (до яких здебільшого звертаються хворі з легеневою патологією туберкульозного генезу) в своїй практиці стикаються з ними, можливо, всього кілька разів на рік, оскільки нерідко легеневі форми супроводжуються наявністю позалегеневих. На сьогодні це є важливою проблемою, особливо з огляду на підвищення рівня виявлення позалегеневих форм, до чого також призводить зростання рівня ко-інфекції туберкульозу та ВІЛ/СНІДу або тільки ВІЛ/СНІДу, частота якого постійно підвищується.

Спеціалісту необхідно вміти виявити та підтвердити такий діагноз у пацієнта. Труднощі діагностики туберкульозу шкіри зумовлені тим, що досить часто прояви захворювання є атиповими, а виявити мікобактерії туберкульозу, послуговуючись доступними методами, здебільшого не вдається. Крім того, відсутні чіткі гістологічні та морфологічні ознаки туберкульозу шкіри, у чому певну роль відіграє недостатня обізнаність лікарів загальної практики щодо проявів цієї патології. Тому в допомогу лікарям загальної практики у запропонованому нами огляді описано найбільш поширені форми захворювання.

Колектив авторів сподівається, що наведений огляд клінічних проявів форм туберкульозу шкіри стане в нагоді лікарям загальної практики (а також спеціалізованого фаху), аби краще вивчити цю досить рідкісну патологію, та допоможе їм вчасно виявляти її у пацієнтів і завдяки цьому раніше розпочинати лікування, що сприятиме досягненню більш швидкого та ефективного результату.

Ключові слова: туберкульоз шкіри, позалегеневий туберкульоз, клінічні прояви туберкульозу шкіри.

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