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MODERN EPIDEMIOLOGICAL TRENDS OF TUBERCULOSIS OF THE SKIN

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Abstract: Cutaneous tuberculosis (TBC) is a heterogeneous group of infectious diseases of the skin and subcutaneous tissue caused by mycobacteria of *the Mycobacterium complex. tuberculosis* (M. tuberculosis , M. bovis , M. africanum). Despite global efforts to combat tuberculosis, TB remains a poorly understood and often undiagnosed manifestation of extrapulmonary tuberculosis (EPTB). This review analyzes current epidemiological data, geographic distribution, risk factors, and methodological challenges in estimating the true prevalence of TB worldwide.

Key words: Cutaneous tuberculosis, extrapulmonary tuberculosis, epidemiology, Mycobacterium tuberculosis , immunopathology, diagnostics.

1. Introduction and Definition of the Problem

Cutaneous tuberculosis is a non-contagious disease that occurs as a result of inoculation, hematogenous, or lymphogenous dissemination of mycobacteria into the skin. Its epidemiology directly correlates with the overall incidence of tuberculosis in the population, but has its own unique characteristics. TB is considered a marker of socioeconomic disadvantage and is often associated with immunodeficiency states. The main epidemiological problem lies in its rarity (1-2% of all cases of EPTB, 0.1-0.2% of the total number of TB cases), non-specific clinical presentation, and difficulties in laboratory verification, which leads to significant underdiagnosis and distortion of real statistical data [1, 2].

2. Classification and epidemiological significance of forms of tuberculosis

The epidemiology of various forms of tuberculosis is uneven and depends on the endemicity of the region, social and hygienic conditions and the immune status of the population.

- **True tuberculosis of the skin (localized forms):** Lupus erythematosus (Lupus vulgaris) is the most common form in countries with low TB incidence. Scrofuloderma (tuberculous colliquative lupus) is more common in children and adolescents in endemic regions. Verrucous tuberculosis of the skin is associated with occupational risks (butchers, pathologists).
- **Tuberculides (reactive forms):** Lichenoid tuberculosis (lichen scrofulosa) and papulonecrotic tuberculosis are more commonly observed in children and young adults with a high degree of tuberculin sensitivity. Their prevalence is higher in regions with high M. tuberculosis circulation .
- **Tuberculosis of the skin against the background of immunodeficiency:** Disseminated forms (miliary tuberculosis of the skin) are almost always associated with severe immunodeficiency, most often in patients with HIV infection, and are a marker of an unfavorable prognosis [3].

3. Global and regional epidemiology

The prevalence of TB directly correlates with the general epidemiological situation of tuberculosis.

- **Regions with high TB incidence:** Countries in sub-Saharan Africa, Southeast Asia, and the Western Pacific (accounting for more than 80% of global TB cases) also exhibit the highest absolute incidence of TB. However, due to diagnostic priorities (pulmonary forms, osteoarticular TB) and limited access to dermatological care, data are often fragmented. Studies from India indicate that TB may account for up to 0.15-0.2% of all dermatological patients, with scrofuloderma and tuberculoids dominating the incidence structure [4].

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- **Regions with low TB incidence:** In North America and Western Europe, TB occurs predominantly among migrants from endemic regions, elderly people with reactivation of latent infection, and immunosuppressed patients . Lupus vulgaris is the predominant form [5].
- **Impact of HIV infection:** The HIV pandemic has dramatically changed the epidemiology of TB in a number of regions. HIV-positive patients have a significantly increased risk of mycobacterial dissemination, leading to an increased incidence of miliary cutaneous TB and atypical, often ulcerative, forms. Studies from South Africa indicate that up to 60% of patients with TB may be coinfected with HIV [6].

4. Risk factors and risk groups

- **Demographic factors:** Age and gender influence the form. Scrofuloderma is more common in children, while lupus is more common in young and middle-aged women. Overall, adults are more likely to be affected than children.
- **Socioeconomic factors:** Low income, poor nutrition, overcrowded living conditions, lack of access to health care.
- **Medical factors:**
  - Recent contact with a patient with active pulmonary TB.
  - The presence of latent tuberculosis infection (LTBI).
  - Immunosuppression : HIV infection (the most significant factor), therapy with glucocorticoids , TNF-α inhibitors (eg, in rheumatoid arthritis, psoriasis), post-organ transplantation.
  - Concomitant diseases: diabetes mellitus, chronic kidney disease, malignant neoplasms.
- **Occupational factors:** Healthcare workers, pathologists, veterinarians, meat processing workers (risk of inoculation with M. bovis).

5. Methodological problems and complexities of epidemiological surveillance

1. **Low index of suspicion:** The clinical picture of TBC is polymorphic and imitates many other dermatoses (sarcoidosis , syphilis, mycobacteriosis , deep mycoses).
2. **Diagnostic challenges:** The sensitivity of histological examination (detection of epithelioid cell granulomas with caseous necrosis) varies. Liquid culture (e.g., MGIT) is the "gold standard," but has low sensitivity for TBC (positive in ~30-50% of cases) and is time-consuming. PCR (including GeneXpert MTB / RIF) has improved diagnostic capabilities, but its availability is limited in regions with high incidence [7].
3. **Lack of separate coding:** In most reporting systems (including WHO), TB is included in the general category of “extrapulmonary TB”, making it impossible to accurately analyze its prevalence at the global level.
4. **Localized registries:** Most epidemiological data come from individual clinical centers, which creates a risk of selective bias.

6. Conclusion and Prospects

Cutaneous tuberculosis remains a "forgotten" form of tuberculosis infection, the epidemiology of which is poorly understood. Its true burden is likely underestimated, especially in countries with high endemicity of TB and HIV. To improve epidemiological surveillance, it is necessary:

- Implementation of clear registration and codification of TB codes in national TB programs.
- Raising awareness among physicians (dermatologists, phthisiologists, general practitioners) about the clinical polymorphism of TBC.
- Expanding access to modern molecular genetic diagnostic methods (PCR, sequencing).
- Conducting large-scale population studies in key endemic regions to estimate the real prevalence, including studying the role of new risk factors (biological therapy, diabetes).

TB control is inseparable from the overall fight against tuberculosis, poverty reduction, improved nutrition, and HIV control. Only a comprehensive, multidisciplinary approach will reduce the hidden burden of this debilitating disease.

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