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CLINICAL CHARACTERISTICS OF TUBERCULOSIS IN WOMEN OF REPRODUCTIVE AGE WITH THYROID DISORDERS

Abstract. Tuberculosis (TB) continues to pose a significant public health challenge globally, particularly among women of reproductive age who have concomitant thyroid disorders. Thyroid dysfunction may influence the immune response, potentially affecting the presentation, progression, and severity of TB. This study aims to examine the clinical characteristics of tuberculosis in reproductive-aged women with thyroid disorders, highlighting how thyroid disease can modify symptomatology, disease course, and treatment outcomes. Understanding these interactions is essential for early diagnosis, effective management, and improving patient prognosis. Enhanced clinical awareness and targeted interventions can contribute to reduced morbidity and better long-term outcomes in this patient population.

Keywords. Tuberculosis; reproductive-aged women; thyroid disorders; clinical features; disease progression; endocrine disorders.

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КЛИНИЧЕСКИЕ ХАРАКТЕРИСТИКИ ТУБЕРКУЛЁЗА У ЖЕНЩИН РЕПРОДУКТИВНОГО ВОЗРАСТА С ЗАБОЛЕВАНИЯМИ ЩИТОВИДНОЙ ЖЕЛЕЗЫ

Аннотация. Туберкулёз (ТБ) продолжает представлять собой серьёзную проблему общественного здравоохранения во всём мире, особенно среди женщин репродуктивного возраста с сопутствующими заболеваниями щитовидной железы. Дисфункция щитовидной железы может оказывать влияние на иммунный ответ, что потенциально отражается на клинической картине, течении и степени тяжести туберкулёза. Целью данного исследования является изучение клинических характеристик туберкулёза у женщин репродуктивного возраста с заболеваниями щитовидной железы, а также анализ влияния тиреоидной патологии на симптоматику, течение заболевания и результаты лечения. Понимание данных взаимодействий имеет важное значение для ранней диагностики, эффективного ведения пациентов и улучшения прогноза. Повышение клинической настороженности и внедрение целенаправленных лечебно-диагностических подходов могут способствовать снижению заболеваемости и улучшению отдалённых исходов у данной категории пациентов.

Ключевые слова: туберкулёз; женщины репродуктивного возраста; заболевания щитовидной железы; клинические особенности; течение заболевания; эндокринные нарушения.

Introduction. Tuberculosis continues to be one of the leading infectious causes of morbidity and mortality worldwide. According to the World Health Organization, women of reproductive age constitute a significant proportion of newly diagnosed TB cases, especially in low- and middle-income countries. In this population, tuberculosis not only affects general health but also has profound implications for fertility, pregnancy outcomes, and maternal health.

Thyroid disorders, including hypothyroidism, hyperthyroidism, autoimmune thyroiditis, and subclinical thyroid dysfunction, are highly prevalent among women of reproductive age. Thyroid hormones play a crucial role in regulating metabolism, immune function, and hormonal balance. Disruption of thyroid function may alter host immunity and influence susceptibility to infectious diseases, including tuberculosis.

Epidemiology of Tuberculosis and Thyroid Disorders in Women. Women of reproductive age (generally defined as 15–49 years) represent a vulnerable group for both tuberculosis and thyroid diseases. The incidence of TB among women in this age group is influenced by socioeconomic factors, nutritional status, access to healthcare, and reproductive health conditions.

Thyroid disorders are significantly more common in women than in men, with autoimmune thyroid diseases accounting for the majority of cases. Hypothyroidism, particularly due to Hashimoto's thyroiditis, is the most frequent thyroid disorder, while hyperthyroidism is less common but clinically significant. Several studies suggest that chronic infections, including TB, may trigger or exacerbate autoimmune thyroid disease through immune dysregulation.

Pathophysiological Interactions Between Tuberculosis and Thyroid Function. The interaction between tuberculosis and thyroid disorders is complex and multifactorial. Thyroid hormones influence both innate and adaptive immunity, affecting macrophage activity, cytokine production, and lymphocyte function. Hypothyroidism is generally associated with reduced immune responsiveness, which may facilitate the progression of latent TB infection to active disease.

Autoimmune mechanisms also play a role in the coexistence of TB and thyroid disorders. Molecular mimicry and persistent immune activation during tuberculosis infection may contribute to the development or progression of autoimmune thyroiditis. Conversely, long-standing thyroid dysfunction may predispose patients to more severe or atypical forms of TB.

General Clinical Features. In women of reproductive age with thyroid disorders, tuberculosis often presents with atypical or less pronounced symptoms. Classical TB manifestations such as prolonged cough, fever, night sweats, and weight loss may be masked by symptoms of thyroid dysfunction. For example, fatigue, weakness, and weight changes are common to both hypothyroidism and tuberculosis.

Night sweats and palpitations may be mistakenly attributed to hyperthyroidism rather than TB, leading to diagnostic delays. In hypothyroid patients, TB may progress slowly with minimal systemic symptoms, increasing the risk of advanced disease at the time of diagnosis.

Pulmonary and Extrapulmonary Forms. Pulmonary tuberculosis remains the most common form in this population. However, extrapulmonary TB, including lymph node, pleural, and genitourinary tuberculosis, appears to be relatively more frequent in women with endocrine disorders. Thyroid dysfunction may contribute to altered immune surveillance, facilitating hematogenous spread of Mycobacterium tuberculosis.

Extrapulmonary forms often present with non-specific symptoms, further complicating diagnosis. In women of reproductive age, genital tuberculosis is of particular concern due to its association with infertility and adverse reproductive outcomes.

Diagnostic Challenges. Diagnosis of tuberculosis in women with thyroid disorders is often delayed due to overlapping clinical features and non-specific laboratory findings. Anemia, changes in body weight, and menstrual irregularities may be attributed to thyroid disease rather than TB.

Laboratory evaluation should include not only standard TB diagnostic tests but also assessment of thyroid function. Imaging findings may also be atypical, particularly in hypothyroid patients with reduced inflammatory response. Drug-induced changes in thyroid hormone levels during anti-TB therapy further complicate monitoring.

Integrated screening strategies, including routine thyroid function testing in women diagnosed with TB and TB screening in patients with thyroid disorders in endemic areas, may improve early detection and outcomes.

Treatment Considerations. The management of tuberculosis in women with thyroid disorders requires a multidisciplinary approach. Anti-tuberculosis drugs may interact with thyroid hormones and antithyroid medications. Rifampicin, a key component of TB therapy, induces hepatic enzymes and can increase the metabolism of thyroid hormones, potentially worsening hypothyroidism.

Prognosis and Outcomes. The coexistence of tuberculosis and thyroid disorders may negatively affect treatment outcomes if not properly managed. Delayed diagnosis, drug interactions, and immune dysregulation can lead to prolonged disease course and increased risk of complications.

However, with early detection, appropriate therapy, and regular monitoring, favorable outcomes can be achieved. Addressing thyroid dysfunction

may improve immune response and enhance the effectiveness of anti-TB treatment.

Conclusion. Tuberculosis in women of reproductive age with thyroid disorders presents distinct clinical characteristics that require special attention from clinicians. Overlapping symptoms, altered immune responses, and treatment interactions contribute to diagnostic and therapeutic challenges. Increased awareness, integrated screening, and a comprehensive management approach are essential to improve outcomes in this vulnerable population.

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