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METHODS FOR DETECTING TUBERCULOSIS IN HIV-INFECTED PATIENTS IN OUTPATIENT (POLYCLINIC) SETTINGS

Abstract. Tuberculosis is one of the leading opportunistic infections among people living with HIV and remains a major cause of morbidity and mortality worldwide. Early diagnosis of tuberculosis in HIV-infected patients is particularly challenging in outpatient healthcare settings due to atypical clinical manifestations and limited diagnostic resources. This article analyzes the most accessible and practical methods for detecting tuberculosis in HIV-positive individuals under polyclinic conditions. Clinical screening, radiological examination, sputum smear microscopy, and rapid diagnostic tests are evaluated. The study emphasizes the importance of an integrated diagnostic approach to ensure early detection, timely initiation of treatment, and reduction of tuberculosis transmission in the community.

Keywords: tuberculosis; HIV infection; outpatient care; diagnosis; sputum microscopy; chest radiography.

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МЕТОДЫ ВЫЯВЛЕНИЯ ТУБЕРКУЛЁЗА У ВИЧ-ИНФИЦИРОВАННЫХ ПАЦИЕНТОВ В УСЛОВИЯХ ПОЛИКЛИНИКИ

Аннотация. Туберкулёз является одной из ведущих оппортунистических инфекций у людей, живущих с ВИЧ, и остаётся одной из основных причин заболеваемости и смертности во всём мире. Ранняя диагностика туберкулёза у ВИЧ-инфицированных пациентов представляет особые трудности в условиях амбулаторно-поликлинической помощи в связи с атипичностью клинических проявлений и ограниченными диагностическими ресурсами. В статье анализируются наиболее доступные и практические методы выявления туберкулёза у ВИЧ-положительных пациентов в условиях поликлиники. Рассматриваются клинический скрининг, рентгенологическое обследование, микроскопия мокроты и экспресс-диагностические тесты. Подчёркивается значение комплексного диагностического подхода для обеспечения раннего выявления, своевременного начала лечения и снижения передачи туберкулёза в обществе.

Ключевые слова: туберкулёз; ВИЧ-инфекция; амбулаторно-поликлиническая помощь; диагностика; микроскопия мокроты; рентгенография.

Relevance of the Study. Tuberculosis and HIV infection represent a serious global health problem, particularly in developing countries. HIV significantly increases the risk of developing active tuberculosis due to progressive immunodeficiency. According to the World Health Organization, tuberculosis is

the leading cause of death among people living with HIV. In outpatient healthcare facilities, early diagnosis of tuberculosis is often complicated by limited access to advanced laboratory and molecular diagnostic methods.

In HIV-infected patients, tuberculosis frequently presents with non-specific or atypical symptoms, which may lead to delayed diagnosis and late initiation of treatment. Polyclinics serve as the first point of contact for most patients; therefore, improving tuberculosis detection at this level is essential. The use of affordable, simple, and effective diagnostic methods in outpatient settings plays a key role in reducing disease burden and preventing further transmission.

Aim of the Study. The aim of this study is to evaluate the most accessible and effective methods for detecting tuberculosis in HIV-infected patients in outpatient (polyclinic) conditions.

Materials and Methods. This study was conducted based on the analysis of outpatient medical records of HIV-infected patients who sought medical care at polyclinic healthcare facilities. The diagnostic process included a comprehensive clinical assessment, evaluation of epidemiological history, physical examination, and identification of tuberculosis-related symptoms such as prolonged cough, weight loss, fever, and night sweats.

Chest radiography was used as a primary imaging method for detecting pulmonary tuberculosis. Sputum smear microscopy for acid-fast bacilli using Ziehl–Neelsen staining was performed in patients with suspected pulmonary involvement. In addition, rapid immunological and screening tests were applied when available. The effectiveness of each diagnostic method was assessed based on detection rates and clinical confirmation of tuberculosis.

Results. The analysis demonstrated that clinical screening remains the most accessible and widely used initial diagnostic method in outpatient healthcare settings, particularly in polyclinics and other primary care facilities where resources may be limited. Clinical evaluation typically includes a detailed patient history, assessment of risk factors such as previous tuberculosis exposure, HIV disease stage, immunosuppressive therapy, and the presence of comorbidities. It

also involves a thorough physical examination to identify possible signs of tuberculosis, including prolonged cough, fever, night sweats, weight loss, and general malaise. Despite being inexpensive and easily implementable, relying solely on clinical screening is insufficient for early and accurate tuberculosis detection, especially in HIV-infected patients, because the clinical manifestations in this population are often atypical or masked by immunodeficiency. For instance, many HIV-positive patients may present without the classical symptoms of tuberculosis, such as persistent cough or cavitary lesions, leading to delayed suspicion and subsequent diagnosis.

Chest radiography, as an additional diagnostic tool, has demonstrated moderate value in identifying pulmonary tuberculosis. Radiographs can reveal patterns such as infiltrates, nodular lesions, or pleural effusions. However, the diagnostic utility of chest X-rays in HIV-infected patients is limited by atypical and non-specific findings. In many cases, radiological manifestations differ from classical tuberculosis presentations observed in immunocompetent individuals. For example, instead of the upper lobe cavitary lesions typical of tuberculosis, HIV-infected patients may display diffuse, bilateral, or lower-lobe infiltrates that can easily be misinterpreted as other pulmonary infections, including bacterial pneumonia or fungal infections. Therefore, while chest radiography can provide valuable supportive information, it cannot reliably confirm tuberculosis in isolation, especially in early or subclinical stages of the disease.

Sputum smear microscopy remains a practical, affordable, and widely applied method for detecting Mycobacterium tuberculosis in outpatient settings. It allows for direct visualization of acid-fast bacilli and provides rapid results within a few hours to a day. However, the sensitivity of this method is reduced in HIV-positive patients, particularly those with a low bacterial load or extrapulmonary tuberculosis, which is more common in immunocompromised individuals. Despite these limitations, sputum smear microscopy continues to be an essential diagnostic tool due to its low cost, simplicity, and feasibility in resource-constrained

environments. To enhance detection rates, multiple consecutive sputum samples are often examined, improving the likelihood of identifying active tuberculosis.

Discussion. Early diagnosis of tuberculosis in HIV-infected patients remains a major challenge in outpatient healthcare practice. Immunosuppression alters the clinical course of tuberculosis, often leading to atypical manifestations and diagnostic difficulties. In polyclinic settings, limited access to advanced diagnostic technologies necessitates reliance on simple and cost-effective methods.

The findings of this study confirm that no single diagnostic method is sufficient for reliable tuberculosis detection in HIV-infected patients. Instead, a combination of clinical evaluation, radiological examination, and bacteriological confirmation should be used. Strengthening diagnostic capacity at the outpatient level is essential for improving patient outcomes and reducing tuberculosis transmission.

Conclusion. Early detection of tuberculosis in HIV-infected patients in outpatient settings is achievable through the rational use of accessible diagnostic methods. Clinical screening, chest radiography, and sputum smear microscopy remain essential tools in polyclinic practice. The implementation of an integrated diagnostic approach enables earlier diagnosis, timely treatment initiation, and improved prognosis for patients with HIV-associated tuberculosis.

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