

CASE STUDY

HIV SCREENING TEST IN A NEWLY DIAGNOSED TB PATIENT: A CASE STUDY

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Abstract

Human immunodeficiency virus (HIV) is the most significant risk factor for having tuberculosis (TB) diseases as people with HIV are 20 times more likely to develop TB disease compared to non-HIV individuals. This paper discusses the case of Lucas (pseudonym), who presented to the emergency department (ED) with a history of chronic diarrhea and symptoms suggesting TB diseases. Lucas was then found to have an active TB infection and According to the guidance on provider-initiated HIV testing and counseling in health facilities, HIV screening should be performed or offered to newly diagnosed TB patients. However, Lucas was not offered to do HIV testing, which may cause inadequate TB therapy that he received. This paper further discusses the pathophysiology of HIV and TB coinfection, followed by a discussion of the nursing assessment and management as well as the medical management in the ED. Then, HIV related stigma will be discussed, as it can be a barrier for introducing HIV testing in TB patients.

Keywords: HIV, AIDS, TBC, HIV stigma, TB HIV coinfection

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Introduction

Human immunodeficiency virus (HIV) is the most significant risk factor for having tuberculosis (TB) diseases (1). People with HIV are 20 times more likely to develop TB disease compared to non-HIV individuals (1, 2). About 25% of death in HIV-infected individuals is associated with TB disease, which makes TB the leading cause of death in people living with HIV/AIDS (PLWHA) (2). TB can occur at any phase of HIV disease (3). A prospective observational study conducted in Papua Indonesia found that 85.2 % of 162 TB patients who agreed to undertake HIV testing and counseling were found to have an HIV seropositive result (4). Therefore, it is strongly recommended to do HIV screening for people with newly diagnosed TB (3, 5).

This paper discusses the case of Mr. X (pseudonym), who presented to the emergency department (ED) with a history of chronic diarrhea and symptoms suggesting TB diseases. Patient X was then found to have an active TB infection. According to the guidance on provider-initiated HIV testing and counseling in health facilities, HIV screening should be carried out or offered to newly diagnosed TB patients or patients who are attending TB clinics (5). However, patient X was not offered to do HIV testing, which may

cause inadequate TB therapy that he received as anti-retroviral therapy (ART) should be started promptly in patients with HIV associated TB, irrespective of CD4+ T cell counts (3).

The pathophysiology of HIV and TB coinfection will be briefly discussed, followed by a critique of the nursing assessment and management as well as the medical management in the ED. Then, HIV related stigma will be discussed, as it can be a barrier for introducing HIV testing in TB patients (6).

Objective

This paper discusses the case of a patient with TB/HIV coinfection presented to the Emergency Department. The pathophysiology of HIV and TB coinfection as well as the nursing management was given to the patient will also be discussed.

Case Presentation

Lucas, a 36-year-old male (pseudonym) presented to the emergency department (ED) complaining of diarrhea, nausea, and vomiting for the past five days. He had also intermittent fever, dry cough, and malaise for the past two weeks. He stated that he had been seen by a doctor and had been given some medicines. There was no other past medical history, except chronic diarrhea that was intermittent for several months. The patient looked pale and lethargic with a Glasgow Coma Score (GCS) of 15 out of 15, his vital signs were: blood pressure: 90/ 65 mmHg, heart rate (HR): 100 beats per minutes, respiratory rate: 20 breaths per minute, temperature: 38, 1^o Celsius and oxygen saturation: 96% on room air. He was given an intravenous (IV) normal saline 1000 ml over 2 hours and 1 gram paracetamol IV. Full blood count (FBC) was done with unremarkable results except for a slight increase in white cell count which was 15. 000/ mm³ (normal range: 4. 000 – 10. 000/ mm³). A 12 lead electrocardiography (ECG) and chest x-ray were performed. The ECG was sinus rhythm, while the chest x-ray showed lobe cavitation, which suggested tuberculosis (TB) infection. The Mantoux tuberculin test was then performed with a positive result. A sputum sample was sent to the laboratory for a culture that revealed a positive result for Mycobacterium Tuberculosis in the next few days. Lucas was diagnosed with active tuberculosis infection and treated as per hospital protocol for TB. Lucas was discharged four days later and referred to primary health care (PHC) for further TB management.

About three months later, Lucas was brought to the ED by his family because of shortness of breath, fever and dry cough. He looked extremely lethargic but conscious with GCS 15 out of 15. His vital signs were: BP: 100/70 mmHg, pulse: 110 beats per minute, RR: 30 breaths per minute, temperature: 39. 0^o C and oxygen saturation: 97% on 6-liter oxygen via a simple mask. Physical examination on the patient revealed rhonchi on chest auscultation and oral candidiasis. The Emergency doctor and the nurses concerned about HIV infection that may occur to Lucas. After a long discussion with Lucas, the emergency doctor suggested doing screening for HIV, which Lucas and his family agreed to do so. A rapid test for HIV was done with a positive result and a blood sample was sent to the laboratory for CD4+ cell count. Lucas was then admitted to the ward, in an isolated room after he received an IV normal saline 1000 ml bolus, 1-gram paracetamol IV and IV antibiotics in the ED. After five days of being treated Lucas was deteriorating and died in the ward.

Discussion

Pathophysiology

HIV attacks the immune system and weakens human immune response against infections and some neoplasms. HIV is a retrovirus that targets the lymphocytes T cells (T4 cells), which are responsible for coordinating immunological functions in the human body (7). HIV causes the acquired immunodeficiency syndrome (AIDS) which is characterized by the emergence of opportunistic infections and some kinds of cancers. The HIV infection may remain asymptomatic for years, but the antibody to the virus can be detected within a few weeks with a blood test or a rapid blood test for HIV antibody (2, 7).

There are two strains of HIV: HIV-1 and HIV-2. HIV entering the host cell by binding to CD4+ receptors. In the host cells, viral DNA is synthesized by the HIV's reverse transcriptase enzyme and interlaced into the host cell genome. Therefore, HIV infection is permanent, as the viral DNA has been integrated into the human's genome (7).

Opportunistic infections and cancers will occur in HIV-infected patients when their CD4+ cells start to fall below a normal level. The normal range of CD4+ count is 500 – 1,200 cells/mm³. TB infection occurs in the early stage when immunodeficiency is mild. Some infections occur when the immunosuppression is severe and are difficult to treat such as *Pneumocystis carinii* pneumonia (7). Other infections that frequently occur in PLWHA include Candidiasis, Kaposi's sarcoma, and Hodgkin's disease. CD4+ cells count and viral load should be measured for staging purposes (8).

A fall in the CD4+ cell count is associated with severe pulmonary TB disease, which increases the risk of death by twofold (9). HIV-TB co-infection may be correlated with the increase of interleukin-4 (IL-4) serum and anti-inflammatory Th1 cytokine that impedes the immune response to *Mycobacterium tuberculosis* (MTb) (9). HIV also causes the impaired phagocytic function of the alveolar macrophages, which may contribute to the increased risk of MTb infection. The clinical presentations of TB disease in HIV-infected individuals include fever, night sweats that lasting for more than three weeks and cough (9).

Nursing assessment and interdisciplinary interventions undertaken

In the hospital where Lucas was admitted, incoming patients will be seen directly by ED nurses as the hospital does not mandate a specific triage nurse. On his first presentation to the ED, Lucas was assessed by an ED nurse which performed a primary survey revealing a patent airway, adequate breathing, and perfusion with a GCS 15 out of 15. Baseline vital signs were also recorded.

A focused history assessment revealed that Lucas suffered from loss of body weight and night sweats. However, there was no further information about the social background and health behavior which may contribute to Lucas's health condition. The Emergency doctor decided to do TB screening which includes chest x-ray, Mantoux tuberculin test and sputum culture for *Mycobacterium tuberculosis*. The results of these procedures have confirmed an active TB infection in Lucas. Lucas was then admitted to the ward and treated as per hospital protocol for TB which include anti-TB therapy, airborne precautions, and referral to the primary health care for further TB treatment.

The ED nurse and the ED doctor have taken appropriate steps to manage a patient presenting with symptoms suggesting TB. However, according to the Ministry of Health of

Indonesia (10), newly diagnosed TB patients should be offered voluntary counseling and testing (VCT) for HIV. However, neither the ED doctor nor the ward doctor was aware of this until three months later when the presented to the ED for the second time with shortness of breath, fever, cough, and oral candidiasis.

A study conducted in Jogjakarta Indonesia in 2008 found several barriers for introducing HIV screening among TB patients, which include lack of knowledge among health providers regarding HIV-TB coinfection, stigmatization of HIV/AIDS, concern about patients feeling insulted and communication issues (6).

A diagnosis of HIV is based on the identification of a specific antigen, antibody or both. A rapid test for HIV antibody is also available worldwide and commonly used for HIV screening (8). To determine the stage of the HIV disease, CD4+ cells count and plasma viral load need to be measured (11).

A rapid test for HIV antibody of patient X revealed a positive result. A sample for CD4+ cell count and plasma viral load have been sent to the laboratory. Patient X died in the ward after five days of being treated. Documentation about the progression of patient X's conditions and interventions given in the ward could not be presented.

Nursing management and interpretation of the outcomes of interventions

On the first Lucas's presentation to the ED, a thorough nursing assessment was not appropriately performed. Lucas had a history of chronic diarrhea for several months, but there is no further information obtained or investigations carried out to establish the causes. Chronic diarrhea could be a very distressing condition for the patient. A detailed history should be assessed in patients with chronic diarrhea, and this includes drugs and alcohol consumption, previous surgery, small bowel, and hormonal diseases and lactase deficiency (11).

Chronic diarrhea could also be a manifestation of opportunistic infections in HIV-infected individuals, which is commonly caused by protozoan parasite *Cryptosporidium* and should be treated with anti-parasitic drugs (12). Therefore, it is important to obtain a comprehensive patient history including health behavior and social background.

Lucas had been diagnosed with an active pulmonary TB disease and treated as per hospital protocol for TB. It has been known that HIV has increased the risk of developing TB in adult and therefore, it is strongly suggested to do HIV screening in newly diagnosed TB patients (1, 4, 5).

However, Lucas had not been explained about the need for HIV testing. The nurses need to have sufficient knowledge about HIV-TB disease and collaborate with the medical officer to facilitate HIV testing for Lucas, as the management for TB in HIV-infected patients might be different from HIV-uninfected patients (9). Furthermore, a study conducted in 2013 found that nurse-led HIV testing has significantly improved the HIV testing rate in a TB clinic in the UK (1).

It has been acknowledged that anti-retroviral therapy (ART) is essential for the success of the TB treatment in HIV-infected patients, as ART reduces the incidence of drug resistance to TB (3). Furthermore, ART therapy during TB treatment may significantly reduce mortality and ART has changed AIDS from a lethal condition into a chronic and manageable disease, especially in developed countries (1, 8).

The hospital where Lucas was admitted does not have a standard operational procedure (SOP) or a guideline for HIV screening. However, the nurses and the medical

officer can follow the guidelines proposed by WHO which states that HIV testing should include informed consent, counseling, correct test results, confidentiality, and treatment or linkage to HIV care service.

Ethical issues and stigma related to HIV/AIDS

HIV AIDS has been one of the most stigmatized and feared disease for the last two decades (13). HIV related stigma is one of the barriers to HIV testing, prevention, and treatment (4, 6). It has been estimated that about 75% of Indonesians who are infected with HIV do not know about their HIV positive status (14).

HIV related stigma has been reported in Indonesia including in clinical settings. In Bali and Jakarta PLWHA have experienced discrimination by health care providers, discouraging HIV testing and ART treatment (15). A study conducted in 2015 found that HIV related stigma among Indonesian nurses is intolerably high and associated with nurses' religiosity and workplace culture (15).

Stigma towards PLWHA in Indonesia is caused by several factors. HIV is previously known as a disease that spreads among injection drug users, homosexual people and female sex workers. All of these behaviors are prohibited in most religions adopted by Indonesian people, which lead to the stigmatization (14, 15).

Workplace culture is another significant factor that contributes to HIV stigmatization. Hospitals that support HIV-infected patients by establishing an HIV care policy and formal HIV training for their health workers have been associated with lower stigmatizing attitudes of their health care providers (16).

Several programs have been proposed by the Joint United Nations Programme on HIV/AIDS (UNAIDS) to reduce HIV-related stigma. These include law enforcement for protecting PLWHA from discriminations and stigmatizations, focus group discussion and community interaction involving PLWHA, engagement with the community and religious leaders and inclusion of non-discrimination principles as part of workplace policies in educational and employment settings (17).

Conclusion

HIV and TB compose the major burden of infectious diseases in developing countries including Indonesia. HIV screening for people with newly diagnosed TB should be performed as recommended by the UNAIDS. However, stigma towards People living with HIV/AIDS in Indonesia is high causing barriers for introducing HIV screening among TB patients. Actions should be taken to reduce HIV-related stigma, which may include law enforcement for protecting PLWHA from discriminations and engagement with the community and religious leaders.

Strength and Limitations

This paper described the patient's conditions with great detail allowing the readers to glean knowledge from the case. It also provides justifications for the need for HIV screening in every newly diagnosed TB patients. However, this paper investigated a patient's circumstances only. Thus, the results cannot be generalized to a wider population.

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