Insights in Chest Diseases

Extended Abstract
Vol. 3, Iss. 2
2018

Pulmonary Disorders: Evaluation of the benefit of different complementary exams in the search for a TB diagnosis algorithm for HIV patients put on ART in Niamey, Niger - Emmanuel Ouedragoo - ONG, Solthis, Niger

Emmanuel Ouedragoo
ONG, Solthis, Niger

Tuberculosis (TB) is an infectious disease usually caused by the bacteria Mycobacterium tuberculosis (MTB). Tuberculosis usually affects the lungs but other parts of the body may also be affected. Most infections do not exhibit any symptoms, in which case they are considered latent tuberculosis. Approximately 10 per cent of latent infections develop to an active disease that destroys about half of those infected if left untreated. A chronic cough with blood-containing mucus, fever , night sweats and weight loss are the main signs of active TB. Because of the weight loss it was historically called "consumption. "[8] Infection of other organs can cause a wide range of symptoms. Tuberculosis is transmitted through the air from one person to the next because people with active TB do not transmit the disease in their lungs cough, spit, chat or sneeze. For people with HIV / AIDS and others who smoke, severe infection happens more frequently. Diagnosis of active TB is based on X-rays in the abdomen, as well as microscopic examination and body fluid culture. Latent TB diagnosis is based on a tuberculin skin test (TST) or blood test. Preventing TB involves screening those at high risk, early detection and case management, and vaccination with the Calmette-Guérin (BCG) bacillus vaccine. Many at high risk include the family, job, and social networks of people with active TB. Care includes the long-term use of several antibiotics. Antibiotic resistance is a growing issue with increasing levels of multiple drug-resistant tuberculosis (MDR-TB) and tuberculosis that is extremely drug-resistant (XDR-TB). Mycobacterium tuberculosis (MTB), a small, aerobic, non-motile bacillus, is the principal cause of TB. This pathogen 's high lipid content accounts for many of its unusual clinical traits. It divides every 16 to 20 hours compared to other bacteria, which usually divide in less than an hour. Mycobacteria have a lipid bilayer external to the membrane. When a Gram stain is performed, MTB either stains "Gram-positive" very weakly or does not retain dye due to the high content of lipid and mycolic acid in its cell wall. MTB can tolerate poor disinfectants and live for weeks in a dry state. In nature the bacterium can only grow within a host organism 's cells, but M. Laboratory tuberculosis may be cultivated. Scientists can identify MTB under a microscope using histological stains on expectorated samples from the phlegm (also called "sputum"). Since MTB retains certain stains even after acidic solution has been treated it is classified as an acid-fast bacillus. The Ziehl – Neelsen stain and the Kinyoun stain are the most common acid-fast staining techniques, which dye acid-fast bacilli a bright red that stands out against a blue background. Auramine-rhodamine staining microscopy and fluorescence are also used. There are several factors that make people more susceptible to TB infections. Globally, HIV is the most significant risk factor; 13 per cent of all people with TB are infected with the virus. This is a particular concern in sub-Saharan Africa, where HIV levels are high. In comparison, about 5–10% of people without HIV who are diagnosed with tuberculosis grow active disease during their lifetimes, 30% of those who are co-infected with HIV.

Tuberculosis is closely related to overcrowding and malnutrition, making it one of the major diseases of poverty. Thus, those at high risk include: people who inject illegal drugs, residents and health workers where vulnerable people meet medically deprived and resource-poor populations, high-risk ethnic minorities, children in close contact with high-risk patients. Chronic pulmonary disease is another major risk factor. Silicosis raises the risk by about 30 times greater. People who smoke cigarettes have about twice the risk of developing TB relative to non-smokers. When people with active pulmonary TB cough, sneeze, talk, sing or spit, they expel droplets of 0.5 to 5.0 μm in diameter from infectious aerosols. A single sneeze can release up to 40,000 droplets. Because the infectious dose of tuberculosis is very small, each of these droplets can transmit the condition. People with prolonged, frequent or close contact with people with TB are at a particularly high risk of infection, with an estimated infection rate

This work is partly presented at International Conference on Pulmonology and Critical Care Medicine during April 24-25, 2017 held at Las Vegas, USA

of 22 per cent. A person suffering from active but untreated tuberculosis may infect another 10–15 (or more) people per year. Also people with active TB should be spread-those with latent infection are not considered to be contagious. The likelihood of transmission from one person to another depends on several factors , including the number of infectious droplets expelled by the carrier, ventilation efficacy, exposure duration, the M virulence. Of those infected with M, about 90 percent. Tuberculosis has asymptomatic, latent TB infections (sometimes referred to as LTBI), with just 10 per cent lifetime risk of progression of latent infection to overt, active tuberculosis. In HIV patients, the risk of developing active TB rises to almost 10 per cent a year.

Statement of the Problem: In Niger, the tuberculosis (TB) screening among people living with human immunodeficiency virus (HIV) (PLHIV) is nonsystematic and the use of additional tests is very often limited. The objective of this research is to evaluate the performance and the cost-effectiveness of various paraclinical testing strategies of TB among adult patients with HIV, using available tests in routine for patients cared in Niamey. Methodology & Theoretical Orientation: This is a multicentric prospective intervention study performed in Niamey between 2010 and 2013. TB screening has been sought in newly diagnosed PLHIV, before ART treatment, performing consistently: A sputum examination by MZN (Ziehl-Nielsen staining) and microscopy fluorescence (MIF), chest radiography (CR) and abdominal ultrasound. The performance of these different tests was calculated using sputum culture as a gold standard. The various examinations were then combined in different algorithms. The cost-effectiveness of different algorithms was assessed by calculating the money needed to prevent a patient, put on ART, dying of TB. Findings: Between November 2010 and November 2012, 509 PLHIV were included. TB was diagnosed in 78 patients (15.3%), including 35 pulmonary forms, 24 ganglion and 19 multifocal. The sensitivity of the evaluated algorithms varied between 0.35 and 0.85. The specificity ranged from 0.85 to 0.97. The most cost effective algorithm was the one involving MIF and CR. Conclusion: We recommend implementing a systematic and free direct examination of sputum by MIF and a CR for the detection of TB among newly diagnosed PLHIV in Niger. Centers to become trauma informed that would help this recognition.

This work is partly presented at International Conference on Pulmonology and Critical Care Medicine during April 24-25, 2017 held at Las Vegas, USA