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Tuberculosis: Early Diagnosis and Treatment

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Recommended Citation

Obeng, Gloria, "Tuberculosis: Early Diagnosis and Treatment" (2019). *Nursing Student Class Projects (Formerly MSN)*. 367.

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TUBERCULOSIS: Early Diagnosis And Treatment

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Introduction

Although there are measures in place to control TB cases in the U.S., TB is prevalent and has high morbidity and mortality rate. This issue is due to failure to identify and treat the disease as early as possible, especially in the latent stage. The late diagnosis of the disease causes delay in treatment which may result in complications or even death. Also, TB cases have been recorded among foreign-born and immigrants who are visiting the U.S. but some of these immigrants are not screened as required. Therefore, it essential for the advanced practice nurse to identify such patients to aid in the early diagnosis and treatment. Moreover, nurses should be knowledgeable and be equipped to assist TB patients during treatment (Furlan, Marcon, & Silva, 2014).

Signs And Symptoms

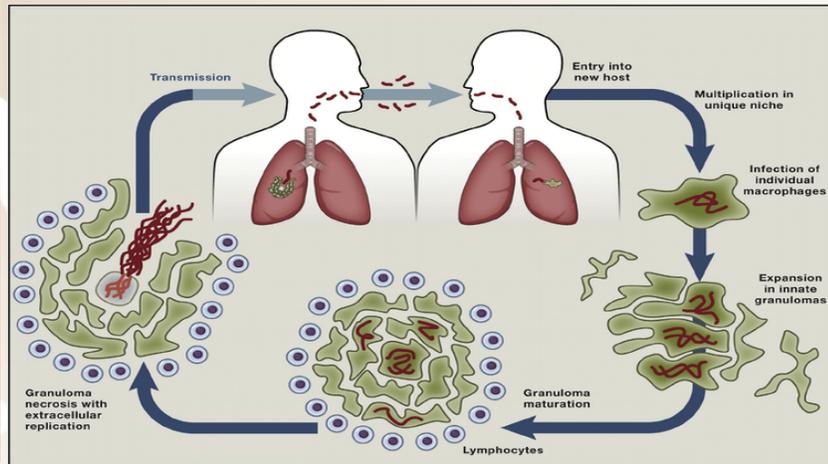
Individuals in the latent stage do not show any signs and symptoms. Signs and symptoms observed in the active phase includes

- Persistent cough
- Fatigue
- Fever
- Loss of appetite
- Weight loss
- Night sweat
- Hemoptysis
- Chills
- Chest pain

Tuberculosis may spread and affect other parts of the parts of the body like the bone or spine, the lymph nodes, the kidney, and the brain. The development of the disease in other organs may cause some specific symptoms such as back pain in patients with TB of the spine, and hematuria in patients whose kidneys are infected.

Underlying Pathophysiology

Tuberculosis (TB) is a contagious disease which usually affects the lung and can spread to affect the kidney, spine, and other organs, and it is caused by a bacterium known as the mycobacterium tuberculosis (CDC, 2016). The mycobacterium tuberculosis is spread by airborne inhalation when an infected person coughs, sneezes, or talks (Amerena, 2017). The bacterium is inhaled and may settle in the alveoli of the lungs, and the immunologic reaction may vary from 2 to 10 weeks (Amerena, 2017). Majority of the tubercle bacilli are destroyed by the alveolar macrophages through ingestion. The remaining bacilli which may live will then multiply and spread to other organs through the lymphatic system and the blood stream (CDC, 2016). There are two stages of the disease, the latent TB stage where an individual is affected by the bacteria for a longer period but is not infectious and do not show any signs and symptoms of the disease, and the active TB stage where the individual shows signs and symptoms of the disease. According to Amerena (2017), about 10% of individuals in the latent phase can develop quickly to active TB if they become immune-compromised.



In the latent tuberculosis infection (LTBI) the bacilli is ingested by the macrophages and the immune system or the white blood cells kills or encapsulate majority of the bacteria which forms the granuloma (CDC, 2016).

Therefore individuals in the LTBI stage

- Do not have the TB disease
- Cannot spread the TB disease
- May test negative for sputum smear and culture
- Will react positive to the Mantoux tuberculin skin test
- Will have normal chest X-ray
- Can receive treatment to prevent active TB (CDC, 2016)

To screen for TB, the Mantoux tuberculin skin test is used. The usual diagnostic test is the acid-fast bacilli but diagnosis must be confirmed with sputum culture (Amerena, 2017). Other supporting diagnostic tests include chest x-ray and CT scan. Rifampicin, streptomycin, ethambutol, Isoniazide, and pyrazinamide are the 5 recommended antibiotics for TB treatment (Amerena, 2017). In countries with high risk of TB, children who are 5 years and below are immunized with Bacillus Calmette-Guerin (BCG) (Amerena, 2017).

Significance of Pathophysiology

Late diagnosis of TB remains an issue in the management of the disease. There is increase of mortality rate associated with late diagnosis because patients usually present with a severe form of the disease. Also, late diagnosis increases the rate of spread or the transmission rate (Furlan, Marcon, & Silva, 2014). Understanding the pathophysiology of tuberculosis will aid in the early diagnosis especially in the latent phase where diagnosis is often missed. Early diagnosis facilitates the control & management of TB due to the early initiation of TB treatment (Furlan, Marcon, & Silva, 2014).

Nursing Implications

It is necessary for the advanced practice nurse to understand the pathophysiology of the disease so that they can

- Make early diagnosis
- Initiate treatment as early as possible
- Monitor TB patients to detect changes and complications (Furlan, Marcon, & Silva, 2014)
- Address patient's concerns related to treatment
- Prevent the spread or control TB disease
- Provide adequate education for the patient and the community
- Follow guidelines and policy in screening patients especially foreign-born patients

Also, nurses should have adequate knowledge about TB so the can provide quality care to patients (Almeida et al, 2018), which include using the appropriate personal protective equipment (PPE), TB test and screening policy and guidelines, and postexposure screening and testing (Sosa et al, 2019).

One factor which facilitates the late diagnosis and treatment of TB is the issue of self medication and drug adherence (De Gocalves de Oliveira et al, 2019). The issue of medication adherence may be due to the duration of treatment and the adverse reactions associated with the medications. It is therefore necessary for nurses to establish good rapport with the patient and their families to enhance treatment adherence.



Tuberculosis

Conclusion

Tuberculosis control and eradication in the U.S. have been successful but in a slow pace. Diagnosing TB disease as early as possible as well as initiating treatment will help in the control of the disease. Screening plays a major role in the early detection of TB. According to (Singer, Noppert, & Jenkins, 2017), both federal and state should incorporate the CDC guidelines in creating their TB screening policy especially TB screening policy for foreign-born and immigrants. Also, reporting every TB case will help in controlling the disease in the communities. Early diagnosis and treatment, monitoring TB patients, educating the community, and appropriate TB screening policies will contribute in eradicating TB.

Additional Sources

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Stop TB