A Review on Current Scenario on Tuberculosis

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Abstract: *Tuberculosis is an infectious disease which is caused by bacteria Mycobacterium tuberculosis. The disease is a communicable disease mostly transmitted from person to person, usually by inhaling bacteria-carrying air droplets. Tuberculosis most commonly affects the lungs, but it can also affect any other organ. In this review on tuberculosis includes an introduction that describes how the lungs are affected by bacilli to enter the body and then spread to the rest of the body. The infection doesn`t always result in disease. The human immune defense cells can check and control pathogens, so that progression to disease only occurs in about 15% of adults. But the infection may remain latent and can reactive at any time, also after decades if e.g. the immune system is weakened. If left untreated, tuberculosis is a life-threatening illness. This article describes important advances in tuberculosis epidemiology, microbiology, diagnosis, pathology, clinical pharmacology, treatment and prevention.*

Keywords: Tuberculosis, Epidemiology, Pathophysiology and Treatment of Tuberculosis.

Introduction:

In recent years Tuberculosis has considered as a major health concern. Each year, approximately 2-million person worldwide death from tuberculosis and 9-million become infected[1].In the U.S, approximately 14000 cases of T.B were reported in 2006, a 3.2% decline from the previous year. However, 20 states and the district of Colombia had higher rates [2]. The popularity of tuberculosis is continuing to increase because of the increasing number of patient infected with human immunodeficiency virus, Bacterial resistance to medication increase interaction travel and Immigration from countries with high prevalence, and growing no. of the homeless and drug abuse [3]. By understanding the constituent organization pathophysiology, transmission and diagnostics of tuberculosis and the clinical manifestation in patients, critical care nurse will be better prepared to recognized infection, prevent transmission, and treat this increasingly common disease.

Causative Organism:

Tuberculosis is an infection caused by rod-shaped, non-spare-forming, aerobic, Bacterium mycobacterium tuberculosis [4]. Mycobacterium typically measure 0.5 micrometer, are classified as acid-fast Bacilli, and have a unique cell-wall, structure crucial to their survival. The composition of cell wall components affects the Bacteria's virulence and growth rate [5]. The peptidoglycan polymer ettends cell wall rigidity, and it's just external to the bacterial cell membrane, another contributed to the permeability Barrier of mycobacterium. To the survival of mycobacteria of the Biosynthetic pathway the cell was a key and gene function and also for the development of Antibiotic to prevent formation of cell wall areas of great interest [6].

Transmission:

Mycobacterium tuberculosis is spread by small air bone droplets called droplets nuclei, generated by coughing, sneezing or talking of a person with pulmonary or laryngeal tuberculosis. These minuscule droplets can remain air- borne for minutes to hours after expectoration [7]. Introduction of M. tuberculosis in to lungs lead to infection of the respiratory system; however, the organism can spread to other organs, such as the lymphatics, pleura, bone, joints or meanings, and cause extra pulmonary Tuberculosis.

Epidemiology:

In 2011, there were 8.7 million new cases of active tuberculosis worldwide including 4,30,000 death among H.I.V infected patients. Representing a slight decrease from peak number in the mid-2000s, more than 60% of these patient were in china, India, the Russia federation, Pakistan and South Africa [8-9]. The absolute number of cases is highest in Asia with India and china having the greatest burden of disease globally [8].

In the United States and most western European countries, the majority of cases occur in foreign-Born residents and recent Immigrants from in which tuberculosis is endemic [10-12].

Pathophysiology:

Once inhaled, the infections droplets settle throughout the air-ways. The majority of the Bacilli are trapped in the upper part of the airways where the mucus-security glob let cell exits. The mucus produced catches foreign substance, and the cilia on the surface of the cells constantly beat the mucus and it entrapped particle upwards the removal [13].The system provides the body with on initial physical

defenses that prevents infection in most persons exposed to tuberculosis [14].Several mechanism and macrophage receptors of the mycobacteria [15]. The mycobacterial lipoarabinomann and is a key ligand for a macrophage receptors [16]. The complementary system also play a role in the phagocytosis of the bacteria [17].
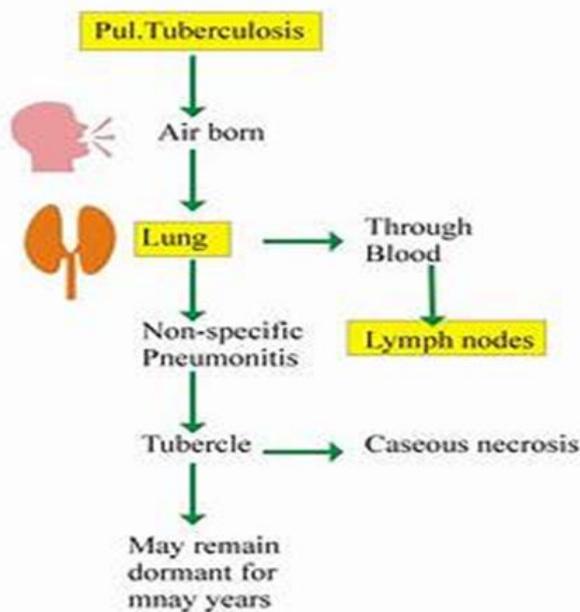

Fig. 1: Pathophysiology of tuberculosis

The outcomes is essentially determined by the quality of host defenses and the balance that occur between host defenses and the invading mycobacteria [18-21].

Test for Diagnosis of TB:

There are several different types of TB test. The TB test available to diagnosis TB. Even if a person has symptoms of TB it is often difficult to diagnosis TB, and it is particularly difficult to diagnosis TB, and it is what is needed to provide effective TB Treatment for drug resistant TB [22].

Culture Test: Although the culture test for TB is very accurate, it can take several weeks to get a result [23]. It also required expensive equipment and skilled personal.

The skin Test: The skin test is widely used four diagnosing TB. In countries with low rates of the TB it is often used to test latent TB infection. The problem with using it in countries with high rates of TB infection is that the majority of people may have latent TB [24]. The spen test involves infecting a small amount of fluid [called tuber wlin] into the spin in the lower part of the arm then the person must return after 48 to 72 hours to have a trained health care worker look at their arm. The health care worker will look for a raised hard area or swelling and if there is one then they will measure its size. They will not include any general area of redness [25] the test result depends upon the size of the raised hard area or swelling.

Chest x-ray: If a person has had TB bacteria which have caused inflammation in the lungs an abnormal shadow may be visible on chest x-ray .Also acute pulmonary TB can be easily seen on an x-ray However, What it shows is not specific. A normal chest x-ray cannot include extra pulmonary TB [26-28]. Also in countries where resources are more limited there is often lack of x-ray facilities.

Symptom: weakness, losing weight, high fever, night sweat, cough.

Drugs for TB treatment:

1. Isoniazid
2. Rifampin (Rifadin, Rimactane)
3. Ethanbutol
4. Pyrozinamide
5. Bedaquiline (sirture)
6. Linezolid (zyvox)

Future Perspective:

MDR-TB is a significant challenge for the control of TB in many parts of the world and a threat to TB elimination. The origin of this problem has been the sub-optimal management, individual or programmatic, of patients with susceptible TB. Inadequate management of cases can be the origin of 50% of the new RR/MDR-TB cases. The other 50% is due to active transmission of RR/MDR-TB strains in the community or healthcare settings. Therefore, to control this epidemic, we will need to improve the management of the susceptible TB cases as well as find and cure most of the RR/MDR-TB cases, to whom best treatment options must be assured.

Fortunately, after almost four decades with practically the same diagnostic tools and armamentarium, there have been significant advances in this field, with a focus on the new global drug-resistant TB epidemic. Drug resistant TB treatment has evolved considerably over the last years, the new shorter MDR-TB regimens and increasing availability of new or repurposed drugs like bed aquiline, delamanid, clofazimieand linezolid envisaged that more patients will be able to be treated and more will survive. If we are careful, we will not repeat previous errors with the new drugs and the dream of developing a universal new regimen with these new drugs for all TB patients, susceptible and resistant to all the old drugs may become a reality. Proper cleanliness drive is needed with medication, so that the chances of communication can be reduced.

Conclusion:

Tuberculosis remains a major cause of death worldwide. The rise and spread of drug resistance and synergistic interaction with the HIV epidemic are posing at TB challenge and threatening global efforts at TB control. Newer anti tuberculosis drug offer the promise of

shortenece disease and latent infection Although these scientific development are promising the global economic greies continue to hinder TB-control programs strong political and financial commitments will be required to achieve global control of TB and albert millions of unnecessary deaths .

Acknowledgement:

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