ORIGINALLY PUBLISHED IN "THE SANGAI EXPRESS" ON 13TH JULY 2013

Tuberculosis: A Continuing Health Challenge – Sh. Nilica Devi

The weariness, the fever, and the fret
Here, where men sit and hear each other groan;
Where palsy shakes a few, sad, last gray hairs,
Where youth grows pale, and spectre-thin, and dies…

(Third stanza, lines 23-26; Ode to a Nightingale: John Keats)

John Keats had written this poem six months after his brother, Thomas died of Tuberculosis (TB) and the references to the disease as well as the theme of death are evident in it. Tuberculosis was a devastating affliction at this time period affecting people across the globe. Also called the "white plague" in those days, TB was so common and so little was known about it, death was accepted as inevitable.

We would have expected a complete eradication of TB much like the smallpox since it is an old disease, its history spanning thousands of years and extending into pre-history. Definitive evidence of tuberculosis has been found in the spines of Egyptian mummies dating from 5000 B. C. Hippocrates had written of TB citing it as the most common disease that proves fatal for anybody infected with it. The disease was described as "a morbid process characterised by progressive debilitation, coughing, haemoptysis, and suppurating lung lesions". Today, TB is second only to HIV/AIDS as the greatest killer worldwide due to a single infectious agent.

WHAT IS TUBERCULOSIS?

Tuberculosis (MTB or TB in short) is an infectious disease caused by a bacterium called ***Mycobacterium tuberculosis***. TB primarily affects the lungs, but it can also affect organs in the central nervous system, lymphatic system, and circulatory system among others. The disease was called "consumption" in the past because of the way it would consume from within anyone who became infected. When people with the disease cough, sneeze, talk or spit, they propel aerosols containing TB bacilli into the air. Only a small number of bacilli are needed to be inhaled to cause an infection.

TB is generally classified as being either latent or active. Latent TB occurs when the bacteria are present in the body, but this state is inactive and presents no symptoms. Latent TB is also not contagious. The immune system either kills or "walls off" the TB bacilli where they can lie dormant for many years. Failure of the immune system to control infection with TB bacilli leads to active disease, when the bacilli multiply and cause damage in the body. Left untreated, each person with infectious type will spread TB to about 10 to 15 people every year. Someone in the world is newly infected with TB bacilli every second. 5% to 10% of people who are infected with TB becomes actively sick. When a person develops active TB, the symptoms include cough, fever, chest pains, night sweats, weight loss, etc.

TUBERCULOSIS IN INDIA

When the news came out in various national dailies a few days back of India running out of life-saving tuberculosis medicines for children and critical testing kits for AIDS patients, there was an outcry among patient groups who warn that the shortages could cost lives and worsen problems of drug resistance. Tuberculosis is and has always been a major public health problem in India. India accounts for one-fifth of the global incidence of TB cases and every year nearly 2 million people

develop TB, of which about 0.87 million are infectious cases. It has been estimated that annually around 3,30,000 people die of TB in India.

Since 1993, the Government of India has been implementing the WHO-recommended DOTS (directly observed treatment) strategy via the Revised National Tuberculosis Control Programme (RNTCP). The objectives of RNTCP are:

- To achieve and maintain at least 85% cure rate amongst New Smear Positive (NSP) pulmonary TB cases.
- To achieve and maintain at least 70% detection of such cases.

COMMON DIAGNOSTIC TESTS

Tuberculosis is diagnosed by finding ***Mycobacterium tuberculosis*** in a clinical specimen taken from the patient. A complete medical evaluation of TB must include a medical history, a physical examination, a chest X-ray and microbiological examination of sputum or some other appropriate sample. It may also include a tuberculin skin test and even a surgical biopsy. Some common tests and methodologies include:

- **Tuberculin skin test**: Also called the Mantoux test, it is performed by injecting a small amount of fluid called tuberculin into the skin in the lower part of the arm. A person given the tuberculin skin test must return within 48 to 72 hours to have a trained health care worker to look for a reaction in the arm. Primarily used as a screening test, this TB skin test is not perfect though, and there can be false-positive or false-negative cases.
- **QuantiFERON-TB Gold:** Approved by FDA, it is a whole-blood test for use as an aid in diagnosing TB infection, including latent ones. Its advantages include requirement of a single visit by patients to draw blood sample, fast, and is unaffected by prior BCG vaccination.
- **Genotype Mycobacteria Direct (HAIN):** Also sometimes referred to as MTB PCR, this polymerase chain reaction test is a direct test for the evaluation of patients that are suspected of having tuberculosis and were not treated or treated less than 7 days with tuberculostatics and who did not receive such a treatment within the last 12 months. Its benefits include the simultaneous detection of ***Mycobacterium tuberculosis*** complex and the four most important and clinically relevant non-tuberculosis species of mycobacteria.
- **Liquid culture systems:** Laboratory diagnosis of TB relies mostly on direct microscopic examination of sputum specimens in most countries. In addition to low sensitivity, it cannot distinguish viable from non-viable organisms. More sensitive than solid culture systems, the liquid culture systems are the standard of care for TB diagnosis and patient management in industrialised countries.

THE SPECTRE OF DRUG RESISTANT TUBERCULOSIS

The emergence of the drug resistant TB and their growing incidence is worrying and represents a public health challenge not only in India but globally. The diagnosis and treatment of drug resistant TB is also more complicated, expensive and problematic than that of regular TB. Its diagnosis can only be carried out in laboratories which have facilities for drug sensitivity testing (DST) to first-line drugs. In 2012, a number of key decisions were taken by the government in an effort to enhance control of TB. This included the banning of inaccurate serological tests for TB diagnosis, making TB a notifiable disease and the launch of a case-based and web-based recording and reporting system. If implemented effectively, these steps will definitely help enhance the prevention and control of TB and drug resistance. A more pragmatic approach would be to engage India's vast private sector in medical diagnostics if we are to contain the menace of increasing cases of drug resistance.

***

(The writer is Junior Microbiologist, BABINA Diagnostics, Imphal)