



## TUBERCULOSIS: A DISEASE MAN FIGHTING SINCE LONG AND SEARCH FOR POTENT ALTERNATIVES

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**ABSTRACT** TB occurs in every part of the world, one third of the world's population is infected with tuberculosis. Mycobacterium tuberculosis is the etiological agent of tuberculosis (TB), an infectious disease which results in approximately 10 million incident cases and 1.4 million deaths globally each year, making it the leading cause of mortality from infection. The credit for discovery of Tubercles bacilli goes to Robert Koch in 1882 as Mycobacterium Tuberculosis which earned him the Nobel Prize in Physiology or Medicine in 1905. Effective drugs to treat and cure the disease have been available for more than 50 years, yet every 15 seconds, someone in the world dies with TB. An approx of 10-15 people per year become prey of Tuberculosis by an active TB patient. Antituberculous drugs are basically classified into two types

- 1) Bactericidal drugs
- 2) Bacteriostatic drugs.

The Bactericidal drugs are Rifampicin, Pyrazinamide, Isoniazid and Streptomycin. The Bacteriostatic drugs are Ethambutol In spite of so many effective drugs in Tuberculosis treatment the Drug Resistance Tb strata is going rise day by day. The major problem in chemotherapy is the Tubercle bacillus is getting mutated with an approx rate of once in  $10^6$  cell divisions.

**KEYWORDS** :Tuberculosis, Bacillus, Drug resistance

### INTRODUCTION

*“As a destroyer of mankind, tuberculosis has no equal”*

- V.A. Moore

Tuberculosis (TB) is an infectious disease caused by the bacillus *M. tuberculosis*. It basically affects the lungs (pulmonary TB) but can also affect other parts of the body (extra-pulmonary TB). The transmission is mainly by the aerosolic dispersion of the bacilli from patients infected with pulmonary tuberculosis due to coughing, sneezing, shouting i.e. Shedding of the Infectious Bacilli from the body.

Tuberculosis has affected the mankind with a long past history. The well known epidemic of North America & Europe during the 18<sup>th</sup> and 19<sup>th</sup> century has given the title to TB as “Captain Among these Men of Death”.

Mycobacterium Tuberculosis is the main causative agent of causing TB which is a slow grower, essentially aerobic and facultative intra cellular micro-organism. It majorly infect the Lungs and other body parts such as lymph nodes, Bones ,Eye, Pleura except the two keratinous structure hair and nail.

Tuberculosis is one of the earliest opportunistic diseases and a leading cause of death in HIV infected persons and the latter is the most powerful risk factor for the progression of active TB disease from a latent TB infection (Bruchfeld *et al.*, 2002).

The major cause of Tb prevalence in most of the developing countries is:-

- a. Lack of proper knowledge about the disease
- b. Improper maintenance of Health and hygiene
- c. Rampant use of Antibiotics (leading to serious threat of Drug Resistance Tb)
- d. Malnutrition and poverty
- e. Lack of proper air ventilation in room
- f. Insufficient sun rays entering inside the room

### Causes of Tuberculosis

The Major cause of disease in humans is usually an open case of pulmonary Tuberculosis. Approx 25 close contacts may develop an active case of Tb before death and cure .Sneezing and coughing may shed as much as 3000 infectious nuclei per cough.

Spreading mostly occurs among household or other close and prolonged contacts with open cases. An effective Tb transmission needs at least 10,000 bacilli per ml by an Active Tb carrier.

Infection also resulted from ingestion of infected milk and very rarely through direct Inoculation. The Tubercle bacilli DNA has been evidenced through molecular analysis in the mummies around 1550-

1080 BC.

Poverty and Tuberculosis relation has been seen since long time. With improvements in living standards the cases of tuberculosis has declined rapidly.

### Search for Alternatives

The Rampant and excessive use of Antimicrobials especially the Antibiotics have posed a major challenge in tackling this major Tuberculosis burden in the Nation and around the world. The use of Antibiotics in simpler cough and cold or in other non-essential ailments gave the chance to existing Bacilli in the body to develop resistant to the existing Antibiotics.

So a need for alternative approaches prevails to search for more potent and effective Antitubercular treatment. Ethno pharmacology and Ethno medicine turns out to be a ray in the dark as it has a vast array of opportunities to develop such therapeutics.

Nigella sativa commonly known as Black seed (English) and kalonji (Hindi) is a Herbaceous plant grown in Middle East, Europe and Western Asia. Nigella sativa seed extract have been extensively used in the treatment of different diseases throughout the world.

Nigella sativa seeds contain active metabolites such as Thymoquinone, Nigellidine, Nigellidine, Thymohydroquinone, and Stigmasterol.

The Anti tubercular effect of Nigella sativa seed has been well known, but more experimentation and purification techniques have to done yet.

### Protective role of Nigella sativa seed (Thymoquinone)

Isoniazid is a well known first line bactericidal Antitubercular drug. Being an effective treatment in Tuberculosis it also has major side effects such as hepatotoxicity. INH induced hepatotoxicity in rats was manifested by sinusoidal dialation, hepatocellular necrosis, moderate portal

Inflammation and degeneration of hepatocytes. These inflammatory signs were not observed in rats pre-treated with N. sativa extracts. The elevated serum levels of ALT, AST, ALP and Bilirubin caused by INH use subsided by the administration of Nigella sativa.

### CONCLUSION

We can say that the disease Tuberculosis is Partially Natural and Partially manmade disaster for the humanity. The Extensive use of Antibiotics pose a major problem also the low living standard and poverty associated with malnourishment make the disease eradication a hurdle.

*Nigella sativa* a safer and effective alternative are available among us also in use in different culture and tradition since time immemorial.

So if better biotechnological and Pharmacological techniques and advancement are used for better extraction and purification of this miraculous herb, it can be a gift for the humanity.

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