
Mycobacterium Tuberculosis Cultures Sensitive to High Doses of Vitamin C and Anti Tuberculosis Drugs is Most Likely Due to Pro-Oxidant Activity.

G.Mary Manjusha Rani*

Department of Biotechnology,
Sreenidhi Institute of Science and Technology,
Yamnampet, Hyderabad, Andhra Pradesh, India

ABSTRACT:

*In the TB pharmacopeia, the first-line drugs INH and RIF are bactericidal, killing 99 to 99.9% of M.tuberculosis cells in vitro within 4 to 7 days. Unfortunately, resistance emerges very rapidly. **Two cheap and widely available substances, vitamin C and ibuprofen, show promise for helping to treat tuberculosis in laboratory models. According to new studies Fenton reaction, sterilizes cultures of drug-susceptible and drug-resistant Mycobacterium tuberculosis, the causative agent of tuberculosis.***

It was suspected that cysteine was helping to kill TB bacteria by acting as a "reducing agent" that triggers the production of reactive oxygen species (sometimes called free radicals), which can damage DNA."To test this hypothesis, we repeated the experiment using isoniazid and a different reducing agent -- vitamin C," Vitamin by itself not only sterilized the drug-susceptible TB, but also sterilized MDR-TB. It was observed that isoniazid-resistant TB bacteria were deficient in mycothiol. TB bacteria that can't make mycothiol might contain more cysteine. So, we predicted that if we added isoniazid and cysteine to isoniazid-sensitive M. tuberculosis in culture, the bacteria would develop resistance, that cysteine was helping to kill TB bacteria by acting as a reducing agent that triggers the production of reactive oxygen species. To test that hypothesis, replaced cysteine with another reducing agent, vitamin C.High doses of VC sterilize M. tuberculosis cultures in vitro.The killing by VC was not to acidification of the media.The addition of 4 mM VC to M. tuberculosis culture did not alter the pH . The activity of VC against M. tuberculosis led us to test whether VC was also active against other Gram-positive and Gram-negative bacteria. But VC activity against M. tuberculosis was specific as the MICs for non-mycobacteria were at least 16 to 32 times higher than against M. tuberculosis. M. tuberculosis was also the most susceptible strain to VC among the mycobacterial strains tested. Vitamin still has to be tested in animals and humans, before any real claims.