A Biological Houseguest from Hell

Yaghoob Kazemi AA; MSc

Abstract

**Background:** Every year, 8 million people around the world develop active TB, and 3 million die, according to the Centers for Disease Control and Prevention. Even in the best health care facilities, patients with TB often balk at the lengthy and often wearying regime. In developing countries with numerous public health challenges, the long treatment and side effects of this treatment are prohibitive. As a result, TB, like Staph and other bacterial infections, is becoming more threatening because of growing worldwide multi-drug resistance.

**Materials and Methods:** This review article is based on my experience in 5 years teaching Respiratory Nursing and working with T.B. patients in clinical settings. Many references are searched and studied to prepare this article but only 13 of them are mentioned.

**Results:** Researchers have identified a new pathway stimulated by the soluble host protein called interferon-gamma that impairs TB’s ability to reproduce itself in mice. Even with interferon-gamma, however, our body doesn’t always succeed in eliminating the bacterium. But interferon-gamma stops TB from replicating, or reproducing itself, inside macrophages. Under these conditions, TB slows in growth until it is latent, or under house arrest, within the body. Normal human aging alone gives TB the possibility of reactivating, disabling and killing any of the two billion people worldwide who are latently infected. When the bug moves out of its latent stage, the person infected is not only at a high mortality risk, but can infect others with TB. An estimated 10 to 15 million people in the U.S. have latent TB.

Now, researchers believe they discovered how tuberculosis (TB) persists in the body, sometimes for decades. And that, says researchers, could lead to new vaccines and improved drug therapies against the disease. The TB bacterium produces an enzyme called isocitrate lyase (ICL) that lets the bug persist in a latent state, multiplying slowly while living off the energy of fatty acids stored inside cells.

**Conclusion:** Researches believe drugs designed to inhibit ICL may eradicate the disease. They know the structure that's required to inhibit ICL. ICL isn't present in humans, so blocking it shouldn't produce side effects, but the research is still at an early stage.

Such an advance in treating TB is badly needed because The last time we had a new class of drugs introduced against TB was in 1967.

**Keywords:** Tuberculosis, multiple drug resistance T.B, Isocitrate lyase, Direct observed therapy, T.B. Vaccine

---

1- Instructor, Army University of medical sciences, faculty of nursing, department of medical surgical