Exploring potential alternatives to antibiotics for management of Tuberculosis

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ABSTRACT

As per WHO, every year about 10 million people are infected with tuberculosis (TB) and 1.5 million people die from it each year, thus making it the top infectious killer in the world. It is estimated that 40% of the Indian population is infected with TB, the vast majority of whom have latent TB. In spite of an effective treatment protocol for TB, there is surging rise in the cases of antibiotic resistance, rendering the treatment ineffective. Hence, finding an alternate therapy which is both safe and effective has become the need of the hour. Instead of treating the TB, altogether preventing the infection in the first place can help in better management of the disease. There are several vaccine candidates in advanced stage of clinical trials throughout the world including VPM1002, MTBVAC, MIP and RUTI which have the potential to overcome the challenges of the BCG vaccine and replace it soon. Bacteriophages can be explored as a therapy option for tuberculosis. They are highly specific with no side effects and have been used for treatment of various diseases for over a century. Several bacteriophages have shown action against Mtb.Anti-tubercular peptides including cathelicidins, defensins and granulosins can be exploited as a potential anti-TB treatment option. Several studies also show nanoparticles like AgNP and SeNP present a new paradigm to overcome the existing TB-therapy limitations. Adjunct immunotherapy with cytokines can be explored to potentiate the action of anti-TB drugs for patients severely affected by the disease. If these promising therapies are researched and well supported, we may find an effective cure for TB very soon and achieve the dream of TB elimination globally.

Keywords: tuberculosis, bacteriophages, vaccines, nanoparticles

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