

Type: Invited Presentation

Final Abstract Number: 36.001
 Session: Tuberculosis: Hot Topics
 Date: Saturday, April 5, 2014
 Time: 15:45–17:45
 Room: Room 1.40

Tuberculosis transmission outside the home

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The history of tuberculosis has been viewed from the industrialised world perspective. TB incidence peaked in the mid-19th century and steadily decreased over the subsequent century. The current world distribution of TB shows that incidence is greatest in non-industrialised countries of sub-Saharan Africa and Asia. South Africa and Swaziland currently have the highest TB burdens in the world where more than 1% of their populations develop TB each year. Cape Town is one of the most heavily TB burdened cities in the world with more TB disease notified annually than the combined numbers of USA, Canada and UK. A comparison of South African and New York TB before chemotherapy demonstrates a 5- to 10-fold decline in TB in New York due to social and environmental factors, which did not occur in Cape Town. In addition to very high TB rates among people living with HIV, HIV-negative individuals living in Cape Town have similar TB burdens as reported a century ago. We therefore went on to explore and quantify the social and environmental locations and environmental factors maintaining the airborne transmission of TB within a local high TB burdened township.

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The interaction between antimicrobial and adjunctive therapies and the immune response to tuberculosis

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HIV-1 infected patients co-infected with some pathogens are at risk of developing of the immune reconstitution inflammatory syndrome (IRIS) when initiating antiretroviral therapy (ART). IRIS is characterized by inflammation leading to the clinical worsening of a treated infection or the unmasking of a previously undiagnosed condition or infection. It is commonly associated with tuberculosis (TB), 8–43% of the HIV-TB co-infected patients prescribed antitubercular treatment and ART develop TB-IRIS. Although IRIS has been recognised for over 20 years, relatively little was known until recently about its pathogenesis. Despite these advances in understanding IRIS, there remains no immune biomarker for diagnostic or prognostic purposes. This talk will review the risk factors asso-



ciated with TB-IRIS, the challenges in studying this syndrome, and how T lymphocytes, dysregulated cytokine responses and innate immunity may contribute to the development of TB-IRIS.

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The role of vitamin D in tuberculosis pathogenesis and treatment

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Tuberculosis (TB) is a major cause of mortality, responsible for an estimated 1.4 million deaths worldwide in 2011. The global prevalence of latent *Mycobacterium tuberculosis* infection is estimated to be 32%, and this carries a 5–20% lifetime risk of reactivation disease. The emergence of drug-resistant organisms necessitates the development of new agents to enhance the response to antimicrobial therapy for active TB. Vitamin D was used to treat TB in the pre-antibiotic era, and its active metabolite, 1,25-dihydroxyvitamin D, has long been known to enhance the immune response to mycobacteria in vitro. Vitamin D deficiency is common in patients with active TB, and several clinical trials have evaluated the role of adjunctive vitamin D supplementation in its treatment. Results of these studies are conflicting, reflecting variation between studies in baseline vitamin D status of participants and dosing regimens. Vitamin D deficiency is also recognised to be highly prevalent among people with latent *M. tuberculosis* infection in both high- and low-burden settings, and observational epidemiological evidence links vitamin D deficiency with increased risk of both acquisition and reactivation of latent *M. tuberculosis* infection. Randomised controlled trials of vitamin D supplementation for the prevention of latent infection or active disease have yet to be performed, however. The conduct of such trials is a research priority, given the safety and low cost of vitamin D supplementation, and the significant public health consequences of positive results.

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New drugs for the treatment of tuberculosis

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Prior to the introduction of chemotherapy tuberculosis management relied upon aeration, heliotherapy and good nutrition. Tuberculosis chemotherapy began in 1944 with the introduction