

Effect of Alcohol and Smoking on Tuberculosis

Candella Abril*

Department of Infectious Disease, National University of Rosario, Rosario, Argentina

DESCRIPTION

The incidence rate of Tuberculosis has declined worldwide but remains unacceptably high. Tuberculosis is currently the ninth leading cause of death and the leading cause of death among infectious disease worldwide. Several behavioral and biological factors are associated with tuberculosis, such as HIV infection, tobacco smoking, alcohol abuse and poor nutrition. Socioeconomic factors, such as poor housing, crowded living conditions, migration, low income and advanced age are also associated with Tuberculosis. There is an established link between poverty and Tuberculosis and increasing evidence suggests that actions or policies that target the socioeconomic determinants of Tuberculosis can reduce its incidence. In addition, the costs of treatment faced by patients, who can be significant in countries without universal health coverage, must be assessed so that interventions can be implemented at the clinical, public health and socioeconomic levels to reduce the burden of tuberculosis. The burden of TB remains high and the rate of progress appears insufficient to achieve the WHO targets. Despite our current knowledge of the biology of *Mycobacterium tuberculosis* and its epidemiology, a holistic approach is needed to improve clinical management and to identify factors associated with infection.

Tuberculosis related mortality is especially significant in the WHO African and Southeast Asian Regions. Poor therapeutic adherence, infection with drug-resistant strains and immunodepression are significantly associated with increased mortality from tuberculosis. In comparison with Drug-susceptible Tuberculosis (DS-TB), mDR- and XDR-TB have higher rates of mortality and relapse and lower rates of treatment success. In particular, the treatment success rate of DS-TB is ~85%-90%, but is 60% for MDR-TB and <30% for XDR-TB. Overall, the incidence of tuberculosis worldwide has decreased at an estimated rate of 4% year and the fastest decline was in the WHO European region.

Immunodepression is the major predisposing factor for Tuberculosis and patients with HIV infections have the highest relative risk for tuberculosis. Several studies have shown that low CD4⁺ counts and high viral load are surrogate risk factors for the occurrence of Tuberculosis, whereas initiation of ART is

associated with a significantly reduced risk. At the population level, an increased HIV notification rate is associated with an increased tuberculosis notification rate.

However, other behavioral and biological determinants such as smoking, alcohol use and malnutrition can also increase the risk of tuberculosis infection and contribute to the pathogenesis of tuberculosis. Socioeconomic determinants such as poor housing, crowded living conditions, migration, low income and advanced age are also important.

Several previous studies have reported a relationship between heavy alcohol use and tuberculosis, but only recently has there been an estimate of the Tuberculosis burden attributable to alcohol use. Worldwide, ~10% of tuberculosis patients are alcohol abusers and avoidance of heavy alcohol use could reduce the number of tuberculosis cases by 17% and the number of tuberculosis deaths by 15%. Excessive alcohol consumption is associated with a 3-fold increased risk of sputum smear-positive cavitary disease, with a longer time to sputum smear conversion and with an increased risk of adverse events to anti-tuberculosis medication. Alcoholism is also linked to other determinants of poor clinical and treatment outcomes, such as low socioeconomic status, homelessness and malnutrition.

Treatment of alcohol abuse may be even harder than treatment of smoking, because psychosocial factors linked to heavy drinking may play a stronger role. The lack of adequate human resources, the high cost of drugs used to treat of alcoholism and the severity of alcohol addiction limit the efficacy of counseling and other medical interventions. Another global risk factor for tuberculosis is intra venous drug use, especially in Eastern Europe and the Americas. According to the United Nations Office on Drugs and Crime, almost 12 million people use intra venous drugs, and one in eight of these individuals is HIV positive. Drug use is frequently associated with homelessness, incarceration and HIV infection.

There are frequently barriers to the care and treatment of intra venous drug users. These individuals also typically have poor treatment adherence due to the social stigma and criminalization of drug use. Furthermore, the delayed diagnosis of Tuberculosis in these individuals may contribute to a higher rate of

Correspondence to: Candella Abril, Department of Infectious Disease, National University of Rosario, Rosario, Argentina, E-mail: brill@ca2ndella.ar

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transmission and the presence of more severe disease. Former intra venous drug users exposed to opiate substitution therapy may also experience drug toxicities following the administration of potentially hepatotoxic tuberculosis drugs or rifampicin, due to the accelerated metabolism of methadone and this could

increase the risk of abstinence syndrome. Recent modeling studies estimated that by 2035, the incidence of Tuberculosis will decline by 33.5% if appropriate actions are taken against extreme poverty and by 76.1% if there are expansions of social protection.