

Addressing smoking cessation in tuberculosis control

Introduction

Considerable information exists on the risks of tuberculosis (TB) infection, morbidity and mortality due to active and passive smoking in low- and middle-income countries.^{1,2} However, the links between smoking and TB and the opportunities to address smoking cessation in TB control were not addressed in the recent *Bulletin* theme edition on TB.³ New approaches to TB control may be necessary to curb this growing epidemic. We argue that these approaches might need to include both cognitive and pharmaceutical assistance for smoking cessation among TB patients.

The International Union against Tuberculosis and Lung Diseases recently called for inclusion of brief smoking cessation advice in standard TB case management.⁴ The WHO had earlier argued that physicians and public health workers should energetically apply anti-smoking interventions in populations with high levels of subclinical TB infection to help prevent activation and spread. It also called for further research and policy development in this area.⁵ We are therefore concerned that smoking cessation was not addressed as an opportunity to reduce the global impact of TB for both infected persons and household contacts of these persons.

Epidemiology

A significant percentage of TB patients may be active or passive smokers. In west Africa, the smoking prevalence rate among TB cases was twice as high as among control household members (35% versus 17%, respectively)⁶ and in India it was 3.5 times as high (86% versus 24%).⁷ Cigarette smoking has also been suggested as a predictor of sex differences for smear-positive TB notifications at the population level.⁸

Two recent meta-analyses on the association of active and passive smoking with TB infection, morbidity and mortality reported a pooled odds ratio (OR) of 1.75–2.08 for latent TB infection, a relative risk (RR) of approxi-

mately 1.7 for TB infection, and a RR of 2.3–2.7 for TB disease for former, current and ever-smokers.^{1,2} The estimated OR for TB mortality among smokers in most of the cited studies (albeit heterogeneous in design) centres around 2.0, providing suggestive evidence for a causal link between smoking and TB.¹ Similar results are described for passive smoking, especially among children in households of TB patients who smoke.^{1,2} Although there is a lack of data on the direct effects of smoking cessation on TB treatment outcomes, available data suggest that smokers, especially male smokers, are less adherent to TB treatment (OR: 1.8; 95% confidence interval, CI: 1.0–3.3), and thus at higher risk for treatment default and persistent infectivity.⁹ They also place their families at risk of infection as a result of passive smoking in the household.

Paradigm shift

Although there is as yet little research on smoking cessation in TB patients, we suggest that in addition to improving TB diagnostics, drugs and vaccines, smoking cessation should be included in TB treatment regimes. Globally, TB and smoking are increasingly co-existent, and in general TB patients lack access to smoking cessation services. Both smoking and TB damage the lungs, and interact at an immunologic and cellular level to reduce treatment efficacy. Smoking suppresses the innate and adaptive immune response with decreased levels of pro-inflammatory cytokines and circulating immunoglobulins, and reduces activity of alveolar macrophages, dendritic cells and natural killer cells.^{10,11} These mechanisms might explain the delayed sputum smear conversion time for smokers compared with nonsmokers, an important indicator of reduced treatment effectiveness, persistent infectivity and relapse. However, most smoking-related immunologic abnormalities are reversible within six weeks of smoking cessation. Thus, cessation may yield substantial positive effects on TB treatment outcomes, relapse and future lung disease.⁹ The DOTS strategy offers access to smokers and guarantees regular patient-provider interaction.

The addition of cognitive behavioural therapy and nicotine replacement therapy (NRT)¹² to DOTS may improve recovery, shorten infectivity and prevent treatment failure. Despite evidence for the efficacy of behavioural and pharmacologic methods to assist quitting, opportunities to treat tobacco dependence in DOTS are still underutilized.¹²

Key policy implications

Both smoking and TB are targeted by major international prevention and control efforts, and tobacco use in developing countries, where TB is most burdensome, is increasing. However, there has been little research on smoking cessation within TB treatment programmes. Outcome data on targeted smoking cessation interventions in countries where such interventions are available and feasible would likely provide policy directions on tobacco control for all low- and middle-income countries. We suggest support for clinical trials to assess the effects of smoking cessation and NRT on TB treatment outcomes, treatment default rates and potential NRT interactions with TB drug therapy. Even without improvements in TB therapeutic outcomes, the expected middle- and long-term health effects of smoking cessation for individual patients are considerable. The results of such research might inform the revision of TB treatment guidelines, including DOTS, at local, national and international levels. This may also be a rare opportunity to address noncommunicable and communicable diseases more effectively through multidisciplinary collaboration. ■

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