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HIV/AIDS, tuberculosis, and tobacco in Brazil: a syndemic that calls for integrated interventions

HIV/AIDS, tuberculose e tabagismo no Brasil: uma sindemia que exige intervenções integradas

VIH/SIDA, tuberculosis, y tabaco en Brasil: una sindemia que apela a intervenciones integradas

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HIV/AIDS, tuberculosis (TB), and tobacco use are three important global health challenges. These epidemics act independently but also collectively, amplifying the health impacts of each. This synergism of diseases is termed "syndemic" [1]. These three epidemics are usually approached through separate programs led by infectologists, pulmonologists, and behavioralists, respectively. The social determinants of disease, including poverty, low-education, high population-density, and cultural norms, are common to all three. The syndemic also challenges health systems and suggests that a systems-based approach may improve disease outcomes as well as practices.

There is evidence supporting linkages between HIV/AIDS, TB, and tobacco use. TB disease, mortality, and recurrent TB are associated with smoking [2]. Smoking increases risk for latent TB infection (LTBI), progression to active disease, delayed sputum conversion, default from treatment, relapse, and drug resistance. Second-hand smoke may also increase risk of TB within households.

TB is the most important opportunistic infection for persons living with HIV/AIDS. HIV/AIDS is a risk factor for poor TB treatment outcomes and higher TB mortality [3]. Persons living with TB have 1.6 times greater risk of progressing to AIDS and were 2 times more likely to die compared with TB negatives [4]. TB also increases HIV replication due to activation of latent virus in macrophages and T-lymphocytes and is associated with reduced CD4+ counts [5]. In a Danish cohort, more than 60% of HIV/AIDS deaths were associated with smoking [6]. Smoking among Persons living with HIV/AIDS increases risks for pneumonia [7] as well as for oropharyngeal diseases [8]. Smoking also increases risks for cardiovascular disease, dyslipidemia, insulin resistance, and chronic lung disease among persons living with HIV/AIDS [9]. Nicotine has modulating effects on immune systems [10].

Three intersecting epidemics in Brazil

HIV/AIDS, TB, and tobacco are significant health challenges for Brazil, together accounting for 150,000 annual deaths [11]. In 2013, there were 93,000 new TB and 760,000 new HIV cases, with 13,000 co-infected [12,13]. Expanded HIV diagnosis among TB patients is a priority in Brazil, and in 2013, 70% knew their HIV status compared with 31% in 2003 [14].

Tobacco use is still a concern in Brazil, with 15% current adult smoking in 2013 and higher prevalence among those with lowest education (20.2%) [15]. A recent cohort study found that after controlling for socioeconomic status, smokers had 2.5 greater risk for recurrent TB compared to non-smokers and that smokers were more likely to default on TB treatment [16]. A 2014 Brazilian cohort study of 2,775 persons living with HIV/AIDS found 29.9% current smokers and 23.9% former smokers [10]. Current smokers were more likely to be less educated; to use alcohol, crack, and cocaine; and to be hospitalized for co-existing conditions.

A syndemic approach

Traditional public health approaches usually involve single programs that do not address interactions of risks or diseases. A syndemic approach to HIV/AIDS and TB should integrate tobacco control in the care of patients with these conditions. At a minimum, improved overall health can be expected as a result of smoking cessation. A more comprehensive approach to the social determinants of tobacco use may also reduce combined effects of TB and HIV/AIDS.

New diagnoses of TB or HIV/AIDS are critical events for patients and could be linked to tobacco interventions. Newly diagnosed TB patients receive directly observed treatment short-course (DOTS), a patient-centered case management approach that requires regular provider contact for six months. This represents an opportunity to address tobacco use among patients and families. Similarly, patients diagnosed with HIV/AIDS and taking anti-retroviral treatment (ART) need significant clinical support to adhere to ART; they may be especially receptive to health interventions such as smoking cessation.

There have been multiple pilot studies on TB and cessation, including in Brazil [17], with randomized trials in Pakistan [18] and South Africa [19]. Brief advice and motivational interviewing were effective in reducing smoking among TB patients. A 2014 review of cessation interventions among persons living with HIV/AIDS indicated that these must take into account social context, mental health, and other risk behaviors. Multiple, varied interventions delivered consistently over time were most successful [20].

Conclusion

There is sufficient evidence that TB, HIV/AIDS, and tobacco use create synergistic disease burdens. Persons with TB and HIV/AIDS who use tobacco may not access health care or social supports necessary for health behavior change. They may not understand the impacts of tobacco use on their infectious diseases, and social norms may facilitate health risk behaviors. Add to this the impacts of poverty, dietary insufficiency, and crowding, and then the challenges to providing comprehensive care become clear. These factors may be best addressed using a systems-based approach.

Brazil has implemented effective TB and HIV/AIDS programs. These may be able to integrate low-cost tobacco control interventions, including cessation services, community participation, and outreach that can reduce tobacco use. To implement integrated tobacco control within TB and HIV/AIDS programs, context-specific research and guidelines are needed. Policies that increase the price of cigarettes, reduce access to tobacco products, support smoke-free homes and workplaces, publicize risks of tobacco use for TB and HIV/AIDS, and mandate cessation counseling in DOTS and ART programs could impact the health of affected populations. However, potential barriers and limitations include: gaining political authority to change policy with DOTS and ART programs; engaging infectologists in the relevance of tobacco control; and involving communities and families in a collective approach to tobacco use among affected patients. Nonetheless, the benefits of a syndemic approach to patients suffering from these conditions would likely far outweigh costs of implementation.

Research to test integration of tobacco control within TB and HIV/AIDS programs should involve the Family Health System in Brazil. In this system, geographically-based Family Medicine teams involving physicians, nurses, practical nurses, and agentes (community health workers) provide comprehensive care to targeted communities. These teams can integrate care for multiple diseases and

address community health. Brazil has prioritized tobacco control as a national objective, with notable success in the reduction of smoking prevalence from approximately 35% among adults in 1989 to 15% in 2013 [15]. This bodes well for an integrated approach to tobacco use among populations affected by TB and HIV/AIDS. However, these populations will need more than simple behavioral therapy to become smoke-free (Figure 1).

Figure 1

Recommendations: addressing the tuberculosis (TB), HIV/AIDS, and tobacco syndemic in Brazil.

1. Implementation research is needed to address the syndemic of HIV/AIDS, TB, and tobacco use in Brazil. Such research must take into account the common social determinants of these conditions.

2. Behavioral interventions alone are insufficient to reduce smoking prevalence among poor, marginalized, and highly vulnerable populations affected by TB and HIV/AIDS. Comprehensive, policy-based approaches must be implemented in order to reinforce clinical behavioral interventions as well.

3. Brazil's priomary care-based health system and established tobacco control efforts provide an appropriate setting to test interventions among highly-vulnerable populations affected by the HIV/AIDS, TB, and tobacco syndemic.

Contributors

T. Novotny contributed in the original concept and completed final editing. E. Hendrickson contributed in the conducted original research and compiled first draft. E. C. C. Soares contributed to the writing, review and approval of the final version. A. B. Sereno contributed to the revision, edition and approval of the final version. S. M. Kiene contributed in the writing and approval of the final version

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