Published in final edited form as:

Int J Tuberc Lung Dis. 2018 June 01; 22(6): 594–595. doi:10.5588/ijtld.18.0262.

A dual purpose for household contact investigations: Preventing TB disease and improving diabetes outcomes

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The intersection of tuberculosis (TB) and non-communicable diseases, such as diabetes, threatens public health and development goals in low- and middle-income countries. Diabetic immunopathy increases the risk of TB infection, active TB disease, and poor treatment outcomes. Diabetes exerts a significant adverse impact on TB control, accounting for 11% of global TB deaths.¹

Adding to this threat, diabetes prevalence is rapidly increasing in regions with TB burden.^{2,3} In southern India where the prevalence of diabetes among patients with active TB is as high as 54%, more than one-third of all TB deaths are attributable to diabetes.^{4,5} The prevalence of diabetes and pre-diabetes in India is among the highest in the world,⁶ and may be even higher among household contacts (HHCs) of patients with active TB disease.

In this month's *Journal*, Shivakumar et al reported findings from a study that screened for diabetes and pre-diabetes within a contact investigation of patients with active pulmonary TB from Chennai and Pune, India. Strengths of this study included high-quality measurement of diabetes and pre-diabetes, latent TB infection, and a thorough characterization of sociodemographic and behavioral factors associated with diabetes and pre-diabetes among HHC. The striking principal result from this study was that nearly 40% of household contacts had either diabetes or pre-diabetes classified by glycated hemoglobin (HbA1c). Moreover, of the HHC with HbA1c $\geq 6.5\%$, more than 60% were new diagnoses of diabetes. This finding should sound an alarm because diabetes and possibly pre-DM increase the likelihood of TB. Ideally, every TB contact in India should be screened for diabetes—as an opportunity for diabetes case finding and to substantially reduce TB incidence.

Given there are nearly 2 million incident active TB cases annually in India, intensive case finding among HHC is not routinely performed. However, in regions similar to Pune and Chennai where TB-diabetes comorbidity is common, there is rationale for evaluating the

cost-effectiveness of screening for both active TB and diabetes among HHC. Effective diabetes prevention programs tailored for Asian Indians, including lifestyle modification and stepwise metformin treatment, should be tested in HHC.^{7,8} Early diabetes and pre-diabetes detection, combined with effective management could reduce the incidence of several chronic conditions including active TB, diabetes complications, and cardio-metabolic morbidities. Prevention of these costly infectious and non-communicable disease healthcare costs may also recoup the resources used to conduct large-scale HHC.

Not only should HHC investigations evaluate the inclusion of diabetes screening, but it is also time to test TB preventive therapy in HHC with diabetes and prediabetes. Clinical guidelines currently recommend preventive treatment of children (< 5 years of age) and people living with HIV who are exposed to infectious cases of TB. The World Health Organization also recommends prioritizing clinical evaluation of HHC for active TB based on risk, emphasizing precedence to immunocompromising conditions.⁹ Shivakumar et al reported that 74% of patients with diabetes and pre-diabetes had TB infection, representing a large group of HHC at increased risk of active TB. Integrated within HHC investigations, a cascade of care for those diabetes and prediabetes should include symptom screening or clinical evaluations for active TB, provision of preventive TB therapy, and linkage to diabetes treatment or prevention programs.

Renewed interest in TB-diabetes comorbidity during the past decade generated convincing data that demonstrate a robust interconnection between diabetes, prediabetes, and TB, but few strategies exist to confront these burdens. Evaluating integrated HHC diabetes screening and care programs and TB preventive therapy among HHC with diabetes are two actionable strategies that could improve our ability to prevent TB-diabetes comorbidity.

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