# Protecting Young Healthcare Trainees from Tuberculosis: Can we overcome apathy?

India ranks first among all countries in the burden of tuberculosis (TB), and healthcare workers (HCWs) in India are exposed to TB on a regular basis. In fact, because Indian HCWs see so much TB, they are rarely shocked about getting TB themselves. Several studies from India demonstrate that Indian HCWs have much higher rates of TB infection and disease as compared to the general population, and extrapulmonary disease is the most common form of TB in HCWs.[1,2]

Among all HCWs, young trainees are the most vulnerable—their rates of infection and disease are exceptionally high.[3–8] Most young trainees (e.g. medical and nursing students) get exposed to TB (and presumably get infected) during their earliest clinical rotations, and some progress to active TB within the subsequent few years. Typically, medical trainees develop TB disease during internship or residency. As one may expect, exposure to TB is particularly frequent during certain rotations, and these include internal medicine, respiratory medicine/chest, DOTS clinic and paediatrics. Because young nursing trainees and nurses spend considerable amounts of time at the bedside, often in crowded wards, they appear to have the highest risk of exposure and infection.[3,8]

Until quite recently, the Revised National TB Control Programme (RNTCP) gave low priority to the problem of nosocomial TB.[9] With the emergence of extensively drug-resistant TB (XDR-TB), and with the successful scale-up of DOTS, the RNTCP is now beginning to address the long-standing issue of TB infection control (TBIC). In 2010, the Ministry of Health and Family Welfare published its first guidelines on the control of airborne infection, with a special focus on TB.[10] Although training workshops and national consultations have taken place, it is unclear if these guidelines are actually being implemented across the country.

Even at the global level, TBIC received low priority until the XDR-TB epidemic, especially in Sub-Saharan Africa, where HCWs in HIV-endemic areas are substantially more likely to be hospitalized with either multidrug-resistant tuberculosis (MDR-TB) or XDR-TB than are non–HCWs.[11] In 2009, the WHO published a policy statement on TBIC in healthcare settings in resource-limited areas.[12] Unfortunately, despite this policy, most national TB programmes in high-burden countries continue to ignore TBIC.

How can guidelines actually make a difference if hospitals and medical colleges do nothing to implement them? In this issue of the *Journal*, Raj and colleagues from the Indian Institute of Technology, Kharagpur, make a commendable effort to take all the available data from India and model the likely benefits of isoniazid preventive therapy (IPT) as an intervention to reduce TB rates in Indian HCWs.[13] Their analysis suggests that the implementation of IPT after serial tuberculin skin testing (TST), along with other general TBIC measures, can have a large impact, especially on young HCWs and trainees. In this subgroup, the benefits outweigh the potential risks and adverse effects of IPT.[13]

As with all modelling studies, the results of the model by Raj *et al*.[13] must be interpreted cautiously. They make several assumptions, and their model input parameters are only as good as the primary data that are available to them. Nevertheless, on the basis of our own research at two Indian medical colleges (Christian Medical College, Vellore and Mahatma Gandhi Institute of Medical Sciences, Sevagram), we are inclined to agree with and support their final conclusion that young HCWs in India need to be targeted for IPT. Our research has consistently shown very high rates of TB infection (annual risk of TB infection [ARTI]) in young Indian HCWs and trainees (approximately 5%–8%, as compared to the national average of about 1.5%, with young nursing trainees having the highest ARTI),[4,8,14,15] and we have also documented the tragic consequences of XDR-TB in young HCWs.[14]

Most hospital administrators in India would baulk at the prospect of offering TST to a large number of HCWs and initiating preventive therapy in nearly half the entire

HCW workforce that is likely to be TST-positive. We acknowledge the challenges involved in doing this. While testing all HCWs might be daunting, we think a strong case can be made for at least doing annual TSTs on young HCWs and trainees, especially medical and nursing students, interns, allied health sciences students who are at risk of TB exposure, and postgraduates during their residency training. In these groups, TST can be an integral component of pre-training/employment screening at the start of training, and repeated every year to identify those who are newly infected (i.e. conversions). Such convertors must then be screened to rule out active TB disease, before the initiation of preventive therapy using daily isoniazid for at least 6 months, or one of the accepted alternative regimens for latent TB infection, including 4 months of daily rifampicin (which may be particularly relevant in settings with high isoniazid mono-resistance).[16]

Preventive therapy must be administered by experienced physicians, after appropriate counselling regarding the risks and benefits, with adequate follow up to ensure adherence. In our experience, many young trainees are greatly concerned when they have TST conversions and are often willing to initiate and complete preventive therapy, when educated about the importance of TST conversions. Clear protocols must be put in place to detect and manage adverse events. Most young people tolerate these regimens well and serious adverse events (e.g. hepatotoxicity) are rare.

As pointed out by Raj *et al.*, preventive therapy is not something hospitals should implement in isolation. In parallel, it will be necessary to at least implement cough etiquette among patients, triage or isolate known TB cases, minimize hospitalization of TB patients, and implement engineering controls such as improved natural ventilation.[12] Hospitals must have a clear written policy on TBIC, ideally, modelled after the WHO and RNTCP guidelines.

The rate-limiting step for Indian hospitals and administrators, we suspect, is not lack of resources. After all, TST screening and isoniazid therapy are inexpensive, and most large hospitals already have the required expertise in hospital infection control committees. The real problem may be apathy, unwillingness to use the available evidence, and the passive, fatalistic acceptance that the risk of contracting TB is part and parcel of being a healthcare professional in India.

If most hospitals today can implement measures to protect HCWs from diseases such as hepatitis B (e.g. using vaccination) and HIV infection (e.g. using anti-retroviral prophylaxis for needle-stick injuries), what is the justification for not extending such logic to TB, a disease that is far more prevalent and much more likely to affect Indian HCWs? For the sake of our young healthcare workers and trainees, we need to make a serious attempt to overcome apathy. In the era of XDR-TB, inaction could be lethal.

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