Multimorbidity in people with tuberculosis

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Each year, tuberculosis (TB) affects 10 million people -mostly the poor. Multimorbidity, the coexistence of two or more disorders, is common in TB, and increases TB disease burden. Many non-communicable diseases (NCDs) cluster together with TB due to common risk factors e.g. smoking, poor diet and immunity, drug interactions and poverty. The most common include: diabetes, depression, chronic respiratory disorders and cardiovascular diseases. Coexisting with TB, these conditions are highly prevalent and commonly cluster together. They are responsible for substantial morbidity, mortality; these conditions adversely interact and worsen TB outcomes, and have common, overlapping or complementary approaches to management. Care for TB multimorbidity remains neglected in single-disease focused TB programmes in high TB-burden countries such as Pakistan. There is an urgent need for a care package for TB multimorbidity that capitalises on synergies in the care of common coexisting NCDs. Such an approach may be more effective, efficient, joined-up, and patient-centred than addressing single comorbid conditions separately. More importantly, people with TB multimorbidity do not need to negotiate multiple, disparate care pathways to access care for co-existing conditions.

The problem

Tuberculosis (TB) is a chronic infectious disease that is common among the poorest communities worldwide. In 2018 alone, it affected 10 million people and led to 1.45 million deaths.[1] Despite concerted efforts, it remains the leading cause of death due to infectious diseases.

Multimorbidity, the coexistence of two or more disorders, is largely neglected in traditional, typically single-disease focused vertical programmes,[2] despite the fact that the common patient experience is of multiple chronic conditions.[3] This is particularly the case for TB. The prevalence of NCDs in people with TB may be twice as high as in those without TB, with diabetes, depression, and chronic respiratory disorders (asthma)[4] being amongst the most common co-occurring conditions.[5] Multimorbidity in TB is associated with complex mental and physical symptoms,[2] worsening of disabilities,[6] poor quality of life,[7] excess healthcare use,[8] increased hospitalisation,[9] premature deaths,[10] and high healthcare costs.[11]

TB and the aforementioned NCDs often cluster together due to common characteristics e.g. social factors (stigma),[12] economics (poverty), health risk behaviours (smoking), impaired immunity and drug interactions.[13] Bidirectional adverse interactions between TB and NCDs cause a multiplier effect on their respective disease burdens and health outcomes.[14] For example, diabetes increases the risk of developing active TB three-fold; in countries with high burden of both TB and diabetes (e.g. India), almost half of all people with TB may have diabetes or pre-diabetes.[15] People with TB and diabetes are less likely to respond to TB treatment and are at higher risk of death,[16] TB relapse,[16] poor quality of life[17] and multidrug resistant TB.[18] Diabetes control and complications are also adversely affected by the presence of TB.[19,21]

Depression and TB share many common determinants and risk factors;[22,23] depression affects the immune system[24] and can be a risk factor for TB.[23] One in four people with TB has depression, adversely affecting adherence to treatment and recovery.[25,26] Untreated depression in TB is associated with treatment default, greater disability, poorer quality of

life and increased risk of death.[27] TB may also worsen depression due to its effect on quality of life[28] and the on-going stigma associated with the condition.[12]

TB is also a risk factor for developing and progressing chronic respiratory disorders.[29] Moreover, people with COPD who develop active TB have a two-fold increased risk of all-cause mortality within 12-months after the TB diagnosis, compared to general population controls with TB but no COPD.[30]

TB and NCDs are a syndemic or synergistic epidemic, sustaining both these epidemics at the population level. For example, NCDs and their risk factors have a substantial influence on maintaining the TB epidemic in high-burden countries.[14] The global diabetes epidemic impedes achievement of Global End TB Targets1 and poor TB outcomes increase the global disease burden attributable to diabetes through poor glycaemic control and rapid progression to complications.[13]

The care for people with TB multimorbidity remains vertical, fragmented and non-personalised, with numerous missed opportunities to prevent, screen for and manage coexisting NCDs. On the other hand, the synergies between TB and NCDs (and between different NCDs) demand effective integrated models to prevent, screen and treat these conditions. The high disease burden and the potential health gains through exploiting these synergies make addressing TB multimorbidity a high global health research priority.

The solution

TB services are an ideal 'test bed' to develop approaches to multimorbidity. The concordance between treatments for TB and for some NCDs is also an opportunity to coordinate care across multidisciplinary teams to address TB multimorbidity.[11] Effective solutions to address common risk factors for TB and NCDs (e.g. smoking cessation support) are rarely integrated within TB programmes,[31] yet could prevent the onset and progression of multimorbidity. Similarly, better diabetes prevention and treatment in TB patients could help reduce the spread of TB (through improving TB treatment success), averting more than a million deaths in 13 high-burden countries by 2035.[32] Addressing depression could improve motivation and adherence to TB treatments.[23]

TB services endeavour to engage with individuals for at least six months, offering multiple opportunities to prevent, screen and manage other chronic conditions. Their (relatively) strong and well-resourced infrastructure may provide a platform for interventions to address multimorbidity, without sacrificing recent gains in TB outcomes.[1]

There is wide recognition of the need for, and strong global and national policy support to address TB multimorbidity (e.g. WHO's 'End TB Strategy,' Stop TB Partnership's 'The Paradigm Shift: Global Plan to End TB 2018-2022' and the 'Global Fund Support for Co-infections and Co-morbidities').[33] Moreover, there are existing evidence-based frameworks for integration,[34] screening approaches,[35,36] and effective interventions,[37-39] that can be used to develop a package to tackle TB multimorbidity. Finally, an increasing global focus on NCDs and the establishment of NCD services in several high TB burden countries is also an opportunity to coordinate care across NCDs and TB services to address multimorbidity.

The opportunity

The need to address multimorbidity in people with TB through effective, integrated and scalable healthcare interventions is well established.[40] WHO also advocates for an integrated person-centred approach through coordination within and across healthcare settings.[41] This should be achieved through alignment between different services.[41] Pakistan is a high TB and NCD burden country. In 2018, Pakistan had 562,000 cases and 44,300 TB deaths (www.stoptb.org). In 2017, 60% of all deaths were attributable to NCDs in Pakistan (www.healthdata.org). On the other hand, Pakistan has a well-established TB programme with strong support from civil society, non-governmental partners and donor agencies. Pakistan has also prioritised NCDs and in Punjab, has recently established NCD clinics at sub-district hospitals (which also have co-located TB clinics). This offers a unique and timely opportunity to develop approaches to coordinate care across the two programmes. Importantly, this will help people with TB multimorbidity to avoid the need to negotiate multiple, disparate care pathways to access care for co-existing conditions.

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