NATIONAL AIDS CONTROL ORGANISATION - NATIONAL TUBERCULOSIS ELIMINATION PROGRAMME, INDIA: SHOULD THEY GO HAND IN HAND?

Kriti Gupta, Pooja Sharma, Radha Chauhan, Mohd. Shariq

Mahatma Vidur Autonomous State Medical College, Bijnor, India

Introduction. Tuberculosis (TB) and human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) contribute to the major proportion of infectious disease, especially in resource-limited countries. This nefarious duo impose prominent diagnostic as well as therapeutic hurdles and are an immense burden on health care facilities. In the individual host the two pathogens, *M. tuberculosis* and HIV, boost each other, accelerating the deterioration of immunological functions and resulting in premature death if left untreated [1]. TB is the largest single cause of death in the setting of AIDS [2].

HIV co-infection is the most potent known risk factor for progression of *M. tuberculosis* infection to active disease, increasing the possibility of latent TB reactivation 20-fold [3,4]. Similarly, TB has been reported to potentiate HIV infection [5,6]. Various evidence indicates that congenital immune disorders and genetic polymorphism influence susceptibility to TB and HIV [7]. The main concern as soon as HIV is detected in a TB patient is to commence TB treatment, followed by Co-trimoxazole Preventive Therapy (CPT) as soon as possible and Antiretroviral Therapy (ART) within the first two to eight weeks of treatment, irrespective of the CD4 count [8].The chief challenge in dealing with co-infection is that nearly half of those living with HIV and associated TB are ignorant of their co-infection status and remain untreated [9]. Joint TB/HIV activities are crucial to reduce this load [10].

To cut down this dual burden, the World Health Organization (WHO) in its 2012 policy on TB/HIV concerted activities suggested routine Provider-Initiated HIV Testing and Counselling (PITC) to both diagnosed TB patients and persons with presumptive TB so as to encourage early recognition and treatment of HIV [11]. PITC is the practice where HIV testing is presented routinely by health care providers to all patients coming to health care facilities as a standard component of medical care [12]. In contrast to voluntary HIV counselling and testing, which is a patient-initiated process, PITC has been documented to increase the uptake of HIV testing [13,14] resulting in early HIV diagnosis, treatment, care and support services. However, PITC in patients with presumptive TB is not extensively implemented worldwide, especially in low HIV burden countries, due to resource limitations [15].

In the high HIV-burden countries of sub-Saharan Africa, studies suggest that prevalence rates of HIV in presumptive TB patients are similar to those in diagnosed TB patients. Most of these HIV-positive patients are entitled for ART and CPT[16,17]. In the countries with low HIV prevalence, studies have found similar results and benefits from HIV testing of patients with presumptive TB [18,19].In spite of this, the uptake of HIV testing has been reported to be low in patients with presumptive TB in India, with situation specific causes including non-availability of HIV test kits, limited human resources, the fact that sputum specimens were sometimes sent to microscopy centres for investigation instead of the patients themselves being referred, lack of health care provider awareness, recording gaps and high workload [20]. However, opt-out HIV testing; in which HIV testing is done except if the patient refuses to do so, has been found to have a higher uptake of HIV testing among patients admitted to the emergency departments of hospitals [21].

Globally just 49% of people with HIV-TB were receiving treatment for both ailments [22]. To build up collaboration between India's National AIDS Control Programme (NACP) and National TB Elimination Programme (NTEP), the Government of India launched single-window services for prevention and management of TB in People Living with HIV (PLHIV) through Antiretroviral Therapy centres (ARTc) in December 2016 [23]. With the revised guidelines, the role of ARTc staff expanded to include TB management (which was hitherto done by NTEP). Thus it became obligatory to have an integrated capacity building initiative for co-management of HIV-TB infection for ARTc staff which was lacking in the past [24]. Deficiency of trained health care workers, inadequacies of health systems, limited coordination for referral have been highlighted as major challenges for delivery of optimal TB care in other countries as well, particularly for HIV-TB [25,26].

Co-morbidity in HIV can be defined as a disease outside the scope of an acquired immunodeficiency syndrome-associated (AIDS-defining) illness. The mean number of general- and HIV-associated co-morbidities amongst HIV patients is 1.1 and 1.4, respectively[27]. The most frequently encountered co-morbidities amongst patients with HIV include: diabetes mellitus, cardiovascular disease (CVD, e.g. hypertension), respiratory diseases (e.g. chronic obstructive pulmonary diseases and pneumonia), and hepatic diseases (hepatitis B and C)[28, 29, 30]. Liver disease, renal disease, substance dependence and abuse, sexually transmitted infections (herpes simplex, syphilis, gonorrhoea and *Mycoplasma genitalium*) and psychiatric disorders (including depression, anxiety, schizophrenia and cognitive impairment) are also greater among HIV-positive individuals [31,32].

Mortality amongst HIV-positive individuals is primarily due to liver disease (hepatitis B and C, alcohol associated or antiretroviral toxicity), vascular disease (associated with smoking, alcohol, anti-retrovirals), AIDS-related conditions (due to non-adherence or intolerance of antiretroviral regimens), lung disease (due to smoking and alcohol), cancer (due to smoking, alcohol, HCV, possibly anti-retrovirals) and violence

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(associated with alcohol and drug use) [33]. Such co-morbidities can occur by chance, but are more often due to the HIV infection and its associated risk factors [34]. Co-morbidity increases with HIV severity and the higher prevalence of co-morbidities among people living with HIV/AIDS may be attributed to antiretroviral toxicity (diabetes, vascular disease and liver disease) or caused by the HIV infection itself (vascular, pulmonary and renal diseases)[35]. Co-morbidity may also be attributed to potential co-infection through overlapping risk factors such as intravenous drug use (HCV) [36]. Recent literature recommends that patients living with HIV should be managed independently of general population guidelines for common medical conditions, and that early diagnosis of HIV may be possible in patients presenting with symptoms of associated diseases (e.g. tuberculosis) [37].

Aim: Primary aim was to compare prevalence of HIV infection in two cohorts of patients: First, people who sought help on their own (client initiated) as well as those who were referred by a doctor or health care provider (provider initiated) coming to Sampoorna Suraksha Kendra (SSK). Second, Among all patients referred from National Tuberculosis Elimination Programme (NTEP) and hence to assess whether linking of National AIDS Control Organisation (NACO) with NTEP is a useful government policy or not. Secondarily, co-morbidities among HIV positive patients were also be studied.

Methods: A seven-month (April 2024 to October 2024) document review was done on 6880 patients (including both client initiated and provider initiated) who came to SSK. These patients also included 1072 patients referred from NTEP. None of the patients were contacted for this study. Data uploaded on the NTEP and NACO portals were analysed month-wise without any disclosure of patient identity. Data analysis was done using SPSS version 20 software.

TB testing for pulmonary tuberculosis was being done by microscopy using Ziehl-Neelsen (ZN) staining and Cartridge-Based Nucleic Acid Amplification Test (CB-NAAT). For HIV serial testing strategy was configured as two or three test algorithms and refer to the use of one screening test followed by one or more other ELISA / Rapid (E/R) tests, depending on the results of the first. A non-reactive result from the initial screening test completes the testing, i.e., report is given out as HIV negative. If the initial test is reactive, it is followed by two more tests (in a three test algorithm) for resolution [38]. Other co-morbidities and modes of transmission were also studied.

Results:

Out of a total of 6880 patients arriving to SSK for pre-test counselling 86% were provider initiated, rest 14% being client initiated.Proportion of males in client initiated and provider initiated patients who were tested for HIV were 68.3% and 57.5% respectively. HIV incidence among all (N=6880) screened patients in SSK was 0.97% (n=67patients)(Figure1). After excluding in-referrals from NTEP (1072 patients), 1.03% (60 patients)came out to be HIV positive. Among 4S (cough, fever, weight loss and/or night sweats) symptomatic patients referredfrom NTEP (i.e. 1072 patients), 0.65% (7) were HIV positive(Figure 2). Although 13.2% (7 out of 53) TB positive patients which were referred from NTEP were also HIV positive.

Out of total 67 HIV positive patients, 19.4% (13) had associated co-morbidities which included pulmonary TB in 8.9% (6), extra pulmonary TB in 4.5% (3), HCV in 1.5% (1), oesophageal candidiasis in 1.5% (1) and both pulmonary TB and oesophageal candidiasis in 2.9% (2) patients.A total of seven patients (10.4%)succumbed to death. Majority of patients (61%,n=67) acquired HIV from heterosexual transmission through casual/ non-commercial/ non-regular partner.

Discussion

People living with HIV have 16 (uncertainty interval 14–18) times more chances to fall ill with TB disease than people without HIV[38], have poorer TB treatment response and have three-fold higher mortality during TB treatment compared to people without HIV[39].

According to data from NACO[40], the incidence of HIV positive patients among TB positive individuals referred from NTEP to SSK is presently around 1.29% with the lowest rate observed in the recent 2021-22 period; this means that approximately 1.29% of TB patients referred from NTEP to SSK tested positive for HIV , as compared to 13.2% in our study. Data stated by NACO is a pan-India statistics which might vary widely amongst states. Uttar Pradesh being a high disease burden state might show higher positivity rates. Moreover, our study clearly shows insignificant difference between HIV positivity rates of all patients coming to SSK (0.97%) as compared to in-referrals from NTEP (0.65%). In contrast, only TB positive in-referrals from NTEP showed significantly high HIV positivity rates (13.2%).

The percentage of notified TB patients who had a documented HIV test result in 2023 was 80%, this was the same level as in 2022, but up from 76% in 2021 [38]. TB is the most important cause of death among people with HIV.HIV and TB form a lethal combination, each accelerating the other's progress. In 2023, about 1,61,000 people succumbed to death due to HIV-associated TB. Our study shows 10.4% mortality rate. Even with progress in the screening, diagnosis, treatment and prevention of TB disease, it remains the chief cause of mortality among people with HIV worldwide.

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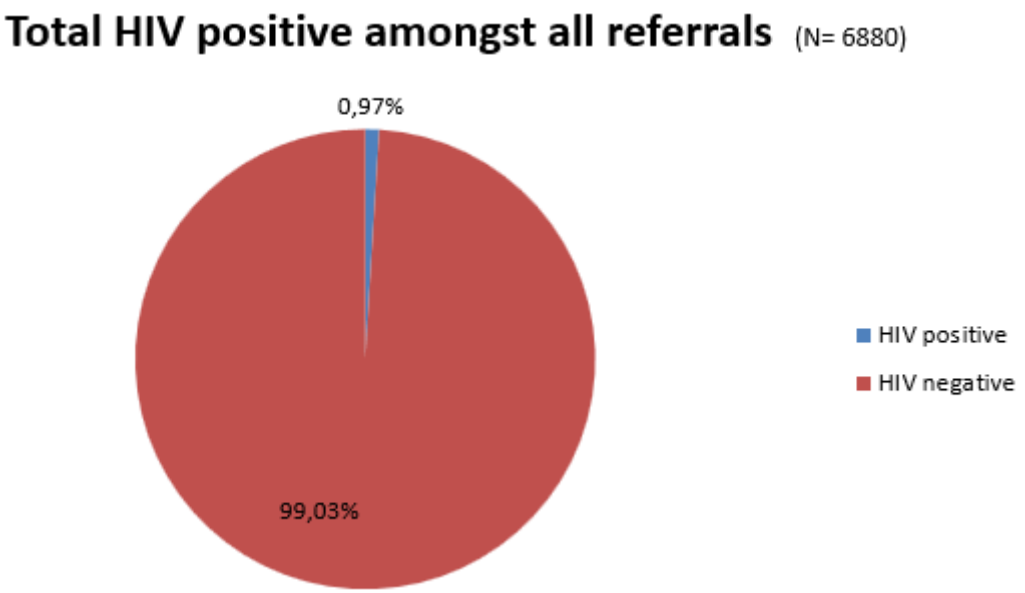

Figure 1. Total HIV positive among all referrals

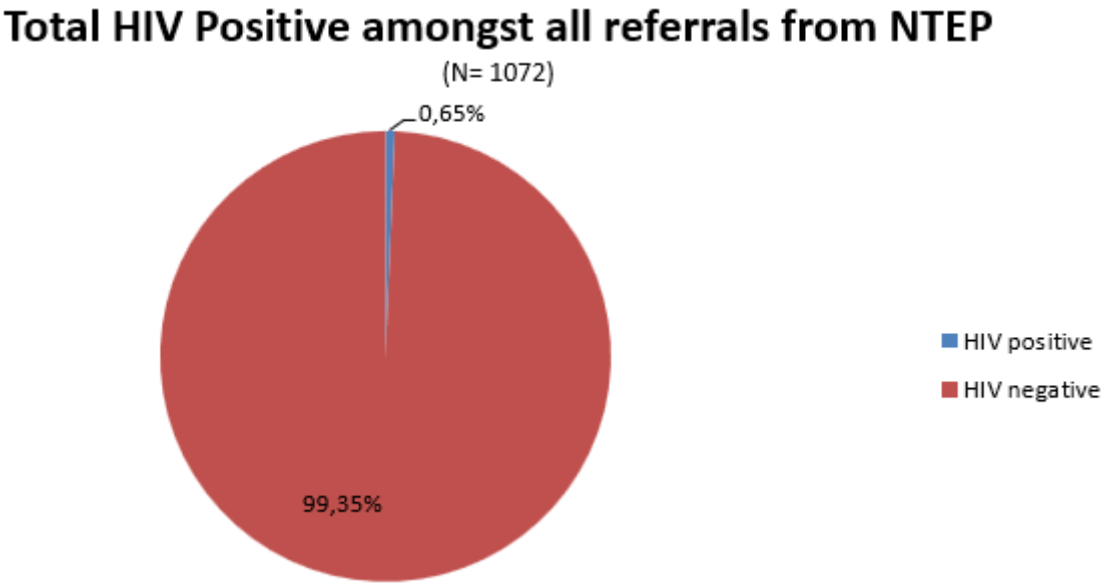

Figure 2. Total HIV positive amongst all referrals from NTEP

The guidelines and operational handbook intend to assist countries in scaling up and sustaining the TB/HIV response as part of people-centred care.

According to the World Health Organization's (WHO) 2023 Global Tuberculosis Report, in 2022, HIV-positive tuberculosis cases accounted for 6.3% of all new tuberculosis
infections [1].

In a study done by Mishra et al [41] among the 289 HIV-positive patients who visited the ART clinic and received treatment, 88 (31%) of them also had TB infection in addition to HIV, and the remaining 201 (69%) were HIV positive only. Comparably, Gupta et al.'s study[42], which involved 251 HIV-positive patients at a tertiary care teaching public health institute in North India, found that 69 (27.5%) of the patients had co-infection with HIV and TB, whereas the remaining 182 (72.5%) were HIV-positive solely. An additional investigation by Padyana et al. of 200 HIV positive patients at a South Indian tertiary care hospital revealed that 146 (73%) of the patients were HIV positive alone, while 54 (27%) had co-infection with tuberculosis [43]

Given the time restraints and confidential nature of extracted data, we were limited in our ability to record patients across services, identify duplicate patient data and entirely investigate all known co-morbidities (such as COPD, etc). Further research is hence warranted, including additional collection of routine data in a wider range of co-morbidities. Co-morbidities may be related to the presence of the HIV infection itself, although it is thought that for some conditions, independent risk factors play a greater role than those that are HIV-related [44].

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Diabetes and CVD may be related to antiretroviral toxicity [45].

Practitioners need to be more aware of the risk of co-morbidities in people with HIV, in particular depression,[46] hepatitis and tuberculosis [33] and the safety implications of interactions between HIV and other medications [47]. Treating co-morbidities early may be beneficial, for example, the early treatment of HCV in PLHIV may improve clinical outcomes [46] and treating mental health issues may improve adherence to ART [44].

Primary care may have an essential role to play in managing the co-morbid diseases of people with HIV[33,47]. Recent changes in the National Health Service(NHS) increasingly emphasise shared care models and moving HIV patient care to General Practitioners (GPs), particularly in treating non-HIV conditions. [48].However, the issue of non-disclosure of HIV status to GPs remains a huge barrier [49]. A programme of standardising knowledge and practices targeted at healthcare professionals who manage long-term conditions including HIV is possibly required. GPs, Genitourinary Medicine (GUM) clinicians and specialist nurses may be the most suitable target as they are likely to interact with these patients.

Conclusion:

Our study clearly shows insignificant difference between HIV positivity rates of all patients coming to SSK as compared to all in-referrals from NTEP. In contrast, only TB positive in-referrals from NTEP showed significantly high HIV positivity rates. Therefore we conclude, in-referral of TB positive patients from NTEP for HIV screening is a useful government policy but referral of all patients (i.e. both TB positive and TB negative) from NTEP should be re-considered.

Around 1 in 5 HIV positive patients in our study suffered from co-morbidities. Prevention of co-morbidities requires more extensive research and subsequent interventions.

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Introduction: Tuberculosis (TB) and human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) comprise the major burden of infectious disease in resource-limited countries. In the individual host, the two pathogens, *Mycobacterium tuberculosis* and HIV, potentiate one another, accelerating the deterioration of immunological functions. **Aim:** The aim of this study was to compare prevalence of HIV infection in two cohorts of patients: First, people who sought help on their own (client initiated) as well as those who were referred by a doctor or health care provider (provider initiated) coming to Sampoorna Suraksha Kendra (SSK). Second, Among all patients referred from National Tuberculosis Elimination Programme (NTEP) and hence to assess whether linking of National AIDS Control Organisation (NACO) with NTEP is a useful government policy or not. Co-morbidities among HIV positive patients were also studied. **Methods:** A seven-month (April 2024 to October 2024) document review was done on 6880 patients (including both client initiated as well as provider initiated) who came to SSK. These patients included 1072 patients referred from NTEP. Data analysis was done by using SPSS version 20 software. **Results:** HIV incidence among all 6880 screened patients in SSK was 0.97% (67patients). After excluding in-referrals from NTEP (1072 patients), 1.03% (60 patients)were HIV positive.Among 4S (cough, fever, weight loss and/or night sweats) symptomatic patients referred from NTEP (i.e. 1072 patients), 0.65% (7patients) were HIV positive. Although 13.2% (7 out of 53 patients) pulmonary TB positive patients which were referred from NTEP were also found to be HIV positive. **Conclusion:** In-referral of TB positive patients from NTEP for HIV screening is a useful government policy but referral of all patients (i.e. both TB positive and TB negative) from NTEP should be re-considered.

Keywords: Human Immunodeficiency Virus, tuberculosis, National AIDS Control Organisation, National Tuberculosis Elimination Programme, India.

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