Impediments to treatment for Tuberculosis and HIV co-infected patients in a single center in Delhi, India in 2014

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Abstract

•**Background :** Tuberculosis (TB) is one of the most important opportunistic infections in HIV-positive patients and was reported to cause one third of deaths in HIV-positive people in 2014. Prompt initiation of ART (Anti-retroviral therapy) and anti-tuberculosis medications(ATT) are known to reduce mortality. This study evaluates the obstacles to treatment in Delhi, India.

•**Method:** The study is a retrospective chart review of HIV positive patients with active TB registered at the National Institute of TB and Respiratory Disease Center in Delhi, India in 2014. Patients eligible for inclusion had to be 15 years of age or older, and must have clinical or laboratory diagnosis of active TB and started on anti-tuberculosis treatment in 2014. The outcomes were compared only in patients who started anti-Tb treatment prior to ART. Groups were primarily compared based on outcomes, as well as site of TB infection. Outcome groups were based on WHO definitions, and the completed treatment and cure groups were combined and compared to defaulted and/or deceased group. Univariate analyses were performed using Fisher's two tailed exact test.

•**Results**: Among 234 patients who were newly registered at the ART clinic, 82 patients (35%) had TB and HIV co-infection. 25 patients had pulmonary TB (PTB) and 56 patients had extra-pulmonary TB (EPTB). 7 died in the PTB and 12 died in the EPTB group. Patients who died with PTB had the lowest baseline CD 4 count (79). Interval between initiation of ATT and ART did not affect the outcome of the PTB group but the interval was shorter in the deceased EPTB group than in the completed/cured group (9 vs 23 days). When the completed/cured group (PTB and EPTB combined) was compared to the defaulted group, baseline CD4 count (155.1 vs 153.5), and mean days from ATT to ART initiation (26 vs 25 days) were similar. 66% of the total completed/cured group had secondary school or higher education, and only 23% in the defaulted/deceased group (p=0.013).

•**Conclusion:** For co-infected HIV-TB patients included in this study, those with PTB vs. EPTB were similar with respect to the completed/cured (52 vs 59%), defaulted (8 vs 10%) and deceased (28 vs 21%) outcomes. Interval days from ATT to ART did not reveal significant difference in outcomes. Education level between completed/cured vs defaulted/deceased groups were significant, perhaps indicating disparities in access.

Background

- Tuberculosis (TB) is one of the most important opportunistic infections in HIV-positive patients and was reported to cause one third of deaths in HIV-positive people in 2014. Prompt initiation of ART (Anti-retroviral therapy) and anti-tuberculosis medications(ATT) are known to reduce mortality.
- The higher case-fatality rate of TB in HIV-infected individuals is likely due to a combination of factors associated with HIV coinfection. One of the factors is delayed start or lack of access to combination antiretroviral therapy (cART) [1], additionally similar barriers often restrict access to ATT.
- The burden of deaths from HIV-associated TB was highest in low- and middle-income countries including India[2]
- This study is to evaluate the obstacles to treatment in Delhi, India

Method

- Retrospective chart review
- Inclusion criteria:
  - Age 15 years or older
  - HIV positive patients registered at the National Institute of TB and Respiratory Disease Center in Delhi, India, ART Centre in 2014 and who were also diagnosed with active TB during this period
  - Clinical or laboratory diagnosis of TB and started on ATT in 2014
  - Patients who started ATT prior to ART
- Patients were divided into the groups based on their treatment outcome (by WHO definitions[3])
- The groups were compared by site of TB infection (PTB vs EPTB[3]), sex, mean baseline CD4 count, the mean interval days between ATT and ART, and education level
- The completed and cure groups were pooled and then compared to the defaulted and to the deceased group
- Univariate analyses were performed using Fisher's two tailed exact test

Results

- Total number of newly registered patients at ART clinic in 2014: 234
- Co-infected HIV-TB patients comprised 35.0% (82) of total ART patients
- Excluded 1 patient due to inadequate documentation
- Patients were further divided into PTB and EPTB group
  - 7 out of 25 patients died in the PTB and 12 out of 56 died in the EPTB group
  - The percentage of treatment outcomes was similar in both groups (table 1)
  - Patients who died with PTB had the lowest baseline mean CD4 count(79)
  - Patients with PTB who completed or cured had the highest CD4 count(165)
  - Interval between initiation of ATT and ART did not affect the outcome of the PTB group. But in EPTB group, the interval was shorter in the deceased group than in the completed/cured group (9 vs 23 days)
- The treatment outcome did not show significant difference in male and female sex (Table 1)
- The completed/cured group (PTB and EPTB combined) was compared to the defaulted group: baseline CD4 count (155.1 vs 153.5), and mean days from ATT to ART initiation (26 vs 25 days) were similar.
- Education level may significantly affect the outcome (p=0.013) (Table 2) :
  - Complete or cure 66% : secondary school or above
  - Defaulted and death 67% : illiterate or primary school

	PTB (%)	EPTB (%)	Male (%)	Female (%)
Complete or cure	52	59	55	62
Death	28	21	22	26
Defaulted	8	10	10	5

Table 1. Comparison of treatment outcome by PTB vs EPTB and by sex in percentage

The treatment outcome did not show significant differences between PTB and EPTB, and between male and female. Total number of PTB patients were 25 and EPTB were 56. PTB and EPTB were combined and then divided into male and female group based on treatment outcome. Total number of male patients were 58, female were 21 and transgender were 2.

	Defaulted (n=8)	Death (n=19)	Complete/cure (n=41)
Illiterate	3	9	7
Primary school	1	5	7
Secondary school	2	4	22
College & above	2	1	5

Table 2. Treatment outcome and education level

It showed 66% of the total completed/cured group had secondary school or higher education, and only 23% in the defaulted/deceased group (p=0.013).

Conclusion

For co-infected HIV-TB patients included in this study, those with PTB vs. EPTB were similar with respect to the completed/cured (52 vs 59%), defaulted (8 vs 10%) and deceased (28 vs 21%) outcomes. The interval between ATT and ART initiation did not result in significant differences in outcomes. Higher education level was significantly associated with better outcomes, perhaps reflecting disparities in access or disparate views and belief structures surrounding health and modern medicine.

References

(1) Harries, A. D., et al. 2001. Deaths from tuberculosis in sub-Saharan African countries with a high prevalence of HIV-1. Lancet 357:1519–1523.
(2) WHO. 2009. Global tuberculosis control: a short update to the 2009 report. World Health Organization, Geneva, Switzerland.
(3) WHO. 2009 Treatment of tuberculosis: guidelines - 4th edition.

Definition

- **Pulmonary tuberculosis** (PTB) refers to a case of TB involving the lung parenchyma.
- **Extrapulmonary tuberculosis** (EPTB) refers to a case of TB involving organs other than the lungs, e.g. pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, meninges. Miliary tuberculosis is classified as extrapulmonary TB. Diagnosis Tuberculous intrathoracic lymphadenopathy (mediastinal and/or hilar) or tuberculous pleural effusion, without radiographic abnormalities in the lungs, a patient with both pulmonary and extrapulmonary TB constitutes a case of extrapulmonary TB. Diagnosis was made by radiologic finding suspicious TB clinically, or microbiologic, geneXpert® or histopathologic evidence.

- **Treatment groups based on outcome**

  - **Cure.** A patient whose sputum smear or culture was positive at the beginning of the treatment but who was smear- or culture-negative in the last month of treatment and on at least one previous occasion.

  - **Completed.** A patient who completed treatment but who does not have a negative sputum smear or culture result in the last month of treatment and on at least one previous occasion.

  - **Default.** A patient whose treatment was interrupted for 2 consecutive months or more.

  - **Died.** A patient who dies for any reason during the course of treatment

  - **Transfer out.** A patient who has been transferred to another recording and reporting unit and whose treatment outcome is unknown.

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