Extrapulmonary Tuberculosis at ART programs in lower income countries: diagnostics and outcomes

Abstract No 288

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Background

- In lower income countries, tuberculosis (TB) accounts for approximately 40% of HIV/AIDS-related adult deaths (1).
- Bacteriological confirmation of extrapulmonary tuberculosis (EPTB), as compared to pulmonary tuberculosis (PTB), is particularly challenging and requires resource-intensive procedures (2).
- Much progress has been made to develop new tests to diagnose EPTB (3), such as Xpert MTB/RIF and other nucleic acid amplification tests (NAAT), but the extent of its use in antiretroviral (ART) programs is unknown.

Objectives

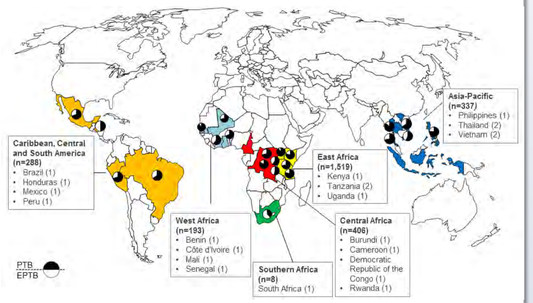
- We studied diagnostic modalities and clinical relevance of EPTB compared to PTB among HIV-positive adults in ART programs from lower income countries.

Methods

Study setting and study population

- We included patient data from HIV/TB co-infected adults (≥16 years) from 22 ART programs participating in the IeDEA network. All were consecutively enrolled between 2012 and 2014 (Figure 1).

Figure 1. Geographic distribution of ART programs, and the proportion of PTB and EPTB cases diagnosed at each site.



Data collection

- Collection of patient-level data using standardized case report forms.
- Data entered electronically using REDCap (www.project-redcap.org).

Definition

- We categorized TB as either "PTB" (dominant site) or "EPTB" only. Patients with both PTB and EPTB were classified as PTB.

Statistical analysis

- We used multivariable logistic regression to assess association of clinical factors with EPTB and clinical outcomes, adjusted for age, sex, history of TB, CD4 cell counts, considering sites heterogeneity.

Results

Patient characteristics

- We analysed 2,751 HIV/TB co-infected adults; 76% with PTB and 24% with EPTB.
- At TB treatment start, patients with EPTB had lower median CD4 cell counts compared to PTB (105 vs. 118 cells/µl).
- Among EPTB patients, the most frequently involved organs were lymph nodes (25%), pleura (15%), abdomen (11%), and meninges (7%, Table 1).

Table 1. Characteristics of HIV/TB patients at start of TB treatment

	All (n=2,751)	PTB (n=2,103)	EPTB (n=648)
Age, median (IQR), year	38 (32-45)	38 (32-45)	38 (32-45)
Female sex, n (%)	1,129 (41.1)	861 (40.9)	268 (41.4)
CD4 cell count, median (IQR),	115 (40-249)	118 (43-253)	105 (35-230)
Other organs involved, n (%)		136 (6.5)	648 (100)
Lymph nodes (extra-thoracic)		34 (1.6)	160 (24.7)
Pleura		16 (0.8)	96 (14.8)
Abdomen		15 (0.7)	73 (11.3)
Meninges		10 (0.5)	43 (6.6)
Others and unknown		61 (2.9)	276 (42.6)
TB treatment outcome, n (%)			
Successful (cured/completed)	1,958 (71.2)	1,494 (71.0)	464 (71.6)
Treatment failed	11 (0.4)	10 (0.5)	1 (0.2)
Died	284 (10.3)	210 (10.0)	74 (11.4)
Lost to follow-up (default)	136 (4.9)	117 (5.6)	19 (2.9)
Not evaluated	362 (13.2)	272 (12.9)	90 (13.9)

IQR, interquartile range; n, numbers; %, percentage

Diagnosis modalities

- Among EPTB patients, smear microscopy was the most commonly used diagnostic test (49%), followed by culture (13%), and Xpert (3%). All other cases (35%) were diagnosed clinically.
- Bacteriologic confirmation (culture, smear, Xpert, other NAATs) was obtained in 80% of PTB and in 52% of EPTB cases (Table 2).
- Proportions of bacteriological confirmation among EPTB cases varied by site: lymph nodes (50% bacteriologically confirmed), meninges (35%), abdomen (32%), joint/bones (29%), and pleura (16%, Table 2).

Risk factors and treatment outcomes

- Among patients with CD4 <50 cells/µL, the risk of EPTB was higher than PTB (adjusted odd ratio [aOR] 1.3, 95% confidence interval [CI] 1.1-1.6).
- EPTB was overall not associated with higher mortality compared to PTB (aOR 1.0, 95% CI 0.7-1.6), but meningitis was (aOR 2.1, 95% CI 1.3-3.3).
- Successful outcomes (cured/completed) were as frequent among EPTB compared to PTB cases (aOR 1.1, 95% CI 0.8-1.3).

Table 2. Bacteriologic confirmation of PTB and EPTB in HIV/TB patients

Site / involved organs	All cases	No test performed	Test result, n, (%)		
	n, (%)	n, (%)	Total	Positive	Negative
All Sites	2,751 (100)	734 (26.7)	2,017 (100)	943 (46.8)	1074 (53.2)
PTB	2,103 (100)	425 (20.2)	1,678 (100)	837 (49.9)	841 (50.1)
PTB only	*1,967 (100)*	*396 (20.1)*	*1,571 (100)*	*754 (48.0)*	*817 (52.0)*
PTB and EPTB	*136 (100)*	*29 (21.3)*	*107 (100)*	*83 (77.6)*	*24 (22.4)*
EPTB only	648 (100)	309 (47.7)	339 (100)	106 (31.3)	233 (68.7)
Involved organs (EPTB cases only)					
Lymph nodes	160 (100)	64 (40.0)	96 (100)	48 (50.0)	48 (50)
Abdomen	73 (100)	32 (43.8)	41 (100)	13 (31.7)	28 (68.3)
Meninges	43 (100)	20 (46.5)	23 (100)	8 (34.8)	15 (55.2)
Pleura	96 (100)	58 (60.4)	38 (100)	6 (15.8)	32 (84.2)
Joint and bones	18 (100)	11 (61.1)	7 (100)	2 (28.6)	5 (71.4)
Others and unknown	258 (100)	124 (48.1)	134 (100)	29 (21.6)	105 (78.4)

Conclusions

- Bacteriological confimation of EPTB at ART programs in lower-income countries was obtained in half of the cases only.
- Strengthening of diagnostic services is needed to improve clinical management of EPTB, particularly in patients with lower CD4 cell counts and severe forms of EPTB.

References

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