

Impact of Sputum Smear-negative (AFB) TB Results on Clinical Outcomes in TB/HIV Co-infected Patients at a Teaching Hospital in Ghana

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Background

Tuberculosis (TB) causes death in 1 out of 4 HIV-infected patients globally. Among TB/HIV co-infected patients in Malawi, negative acid-fast bacilli (AFB) TB sputum smear results has been associated with higher death rates compared to patients with positive (AFB) TB smear test results. We hypothesized that negative TB smear results may account for higher TB mortality in HIV-infected patients in Ghana.

Methods

This retrospective study compared patients with sputum smear-negative versus smear-positive pulmonary TB (PTB) results seen at Korle-Bu Teaching Hospital Chest Clinic in Accra, Ghana from January 2010 to December 2014. The study included TB/HIV co-infected patients and smear-negative TB results and controls with sputum smear-positive TB results. Inclusion criteria comprised diagnosis of TB and HIV within study period and age 13 years or older. Mann-Whitney Rank Sum Tests (continuous variables) and chi-square test (categorical variables) were used to compare patient characteristics.

Results

In this study, PTB smear status was abstracted from records of 668 subjects. Of these subjects, 246 (36.8%) had sputum AFB-positive PTB, and 422 (63.2%) had sputum AFB-negative PTB. Overall, 23.8% of the subjects died. Patients with smear-negative PTB had higher median age (40 years versus 38 years, $P=0.029$) and higher body weight (51.0 kg versus 45.5 kg, $P=0.021$) compared to smear-positive subjects. A greater proportion of smear-negative patients presented with PTB for the first time, while smear-positive patients were more likely to relapse or return after previous treatment default ($P<0.001$). Extra-pulmonary involvement and disseminated TB were more likely to present with negative smear results ($P<0.001$). There was no difference in clinical outcome between patients with smear-negative TB and smear-positive TB status in our study ($P=0.684$).

Conclusion

This study demonstrates high mortality for both sputum smear-negative and smear-positive AFB results in patients co-infected with TB/HIV. However, unlike the Malawi study, smear status did not appear to influence treatment outcomes. The high frequency of disseminated TB in smear-negative patients suggests that a high index of clinical judgment and possible additional testing are needed for early diagnosis and treatment of tuberculosis in patients with HIV. Additional analysis is planned to further evaluate the impact of HIV treatment on TB treatment outcomes and whether this influences the lack of association of smear results and clinical outcomes.

	Smear Status			
Characteristic	All Patients (N = 668)	Smear-negative (N = 422)	Smear-positive (N = 246)	P value
Median (IQR) age (years)	39 (32, 48)	40 (33, 49)	38 (32, 45)	0.029
Median (IQR) body weight (kg)	50 (43, 48)	51.0 (44.0, 58.0)	45.5 (40.8, 55.3)	0.021
	n (%)	n (%)	n (%)	
Sex (n = 667 total)				0.109
Male	347 (52.0)	230 (54.5)	117 (47.8)	
Female	320 (48.0)	192 (45.5)	128 (52.2)	
Type of patient (n = 667)				<0.001
New	606 (90.1)	394 (93.8)	212 (86.2)	
Transferred in	11 (1.6)	6 (1.4)	5 (2.0)	
Return after default	8 (1.2)	3 (0.7)	5 (2.0)	
Relapse of TB	26 (3.9)	11 (2.6)	15 (6.1)	
Failure of previous TB treatment	11 (1.6)	2 (0.5)	9 (3.7)	
Other	5 (0.7)	5 (1.2)	0 (0)	
Previously treated TB (n = 664)				0.002
No	645 (97.1)	414 (98.8)	231 (94.3)	
Yes	19	5 (1.2)	14 (5.7)	
Treatment outcome (n = 631)				0.684
Cure or completed treatment	380 (60.2)	248 (60.9)	132 (58.9)	
Died	150 (23.8)	92 (22.6)	58 (25.9)	
Default	38 (6.0)	27 (6.6)	11 (4.9)	
Transfer out	63 (10.0)	40 (9.8)	23 (10.3)	
TB class (n = 668)				<0.001
Pulmonary	525 (78.6)	297 (70.4)	228 (92.7)	
Extra-pulmonary	81 (12.1)	71 (16.8)	10 (4.1)	
Disseminated	62 (9.3)	54 (12.8)	8 (3.3)	

