

Baseline predictors of treatment outcome in a multicenter prospective clinical cohort: a study from a resource-limited setting

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Conclusions

Functional status, CD4 count, viral load, TB co-infection, and OIs other than TB were the main predictors of treatment outcome in the first year of ART. Early ART initiation and considering TB and other OIs treatment before depletion of CD4 cells and worsening of patients' general conditions may facilitate better treatment outcome in resource-limited settings like Ethiopia.

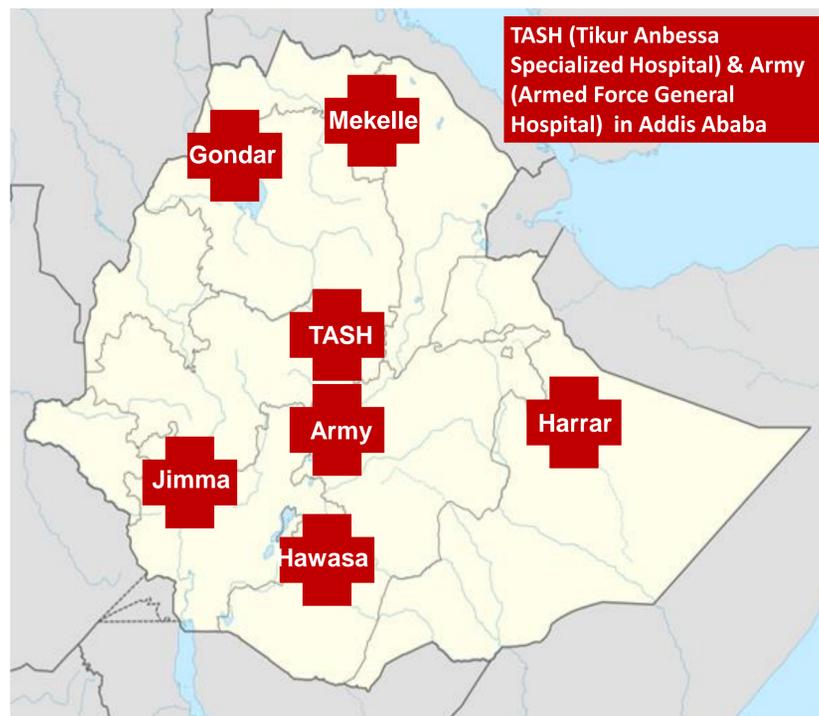


Figure 1: Geographical locations of study sites.

Introduction

Antiretroviral therapy (ART) has been rapidly scaled up in Ethiopia since 2005, but factors influencing the treatment outcome are poorly studied.

Objectives

This study aimed at identifying baseline factors affecting the first-line ART outcome during 6- and 12- months of ART in Ethiopia.

Materials and Methods

The study was conducted on a large country-wide multicenter prospective cohort, which comprised of 874 ART naïve adult HIV-infected patients who enrolled and started ART at seven university affiliated hospitals (Figure 1) from 2009 to 2011 and followed until 2013. Sociodemographic, clinical, viral load and immunological data at baseline and follow-up (at month 6 and 12) were obtained. Both stepwise forward and backward regression methods in multivariate logistic regression were employed to develop two separate models and identify baseline predictive factors for risk of ART failure. Treatment failure was defined as failure to attain viral suppression (< 150 HIV-1 RNA copies/μl) or AIDS-related death.

Results

Over 10% of the participants (n=94) died from AIDS during the 4 years follow-up. Of them, 47%, 66%, and 80% died within 3-, 6- and 12- months of ART initiation, respectively. Nearly 13% of participants with available viral load (n=855 for 6 month; n=454 for 12 month) failed to achieve viral suppression. Thus, the total proportions of failures were 20% and 26% at 6- and 12- months, respectively. Functional status, CD4 count, and viral load at baseline were the main predictors of treatment failure at month 6. Likewise, functional status, TB co-infection, OIs other than TB, and CD4 count were found to be main predictors of treatment failure during the first year (Table 1).

Table 1. Bivariate and multivariate associations between baseline predictive characteristics and treatment failure during 6- and 12- months of treatment follow-up periods in seven Ethiopia hospital ART clinics (2009-2013).

Predictive factors		Bivariate		Multivariate*			
		Month 6 n(%)	OR (95% CI)	Month 12 n(%)	OR (95% CI)	Month 6 OR (95% CI)	Month 12 OR (95% CI)
Hospital	TASH	108(15)	1	98(19)	1	1	1
	Army	93(13)	0.46(0.23; 0.93)	63(12)	0.77(0.35; 1.68)	0.77(0.35; 1.68)	0.77(0.35; 1.68)
	Gondar	117(16)	0.47(0.25; 0.91)	89(17)	0.66(0.32; 1.37)	0.66(0.32; 1.37)	0.66(0.32; 1.37)
	Jimma	104(14)	0.37(0.18; 0.76)	73(14)	0.77(0.37; 1.63)	0.77(0.37; 1.63)	0.77(0.37; 1.63)
	Mekelle	107(15)	0.71(0.38; 1.33)	80(15)	1.40(0.72; 2.73)	1.40(0.72; 2.73)	1.40(0.72; 2.73)
	Harrar	86(12)	0.89(0.47; 1.70)	46(9)	1.91(0.89; 4.08)	1.91(0.89; 4.08)	1.91(0.89; 4.08)
	Hawassa	119(21)	0.84(0.46; 1.52)	80(15)	1.96(1.02; 3.75)	1.96(1.02; 3.75)	1.96(1.02; 3.75)
Functional status	Working	574(79)	1	411(78)	1	1	1
	Ambulatory	132(18)	2.00(1.30; 3.07)	101(19)	2.54(1.60; 4.04)	2.00(1.30; 3.07)	2.54(1.60; 4.04)
	Bedridden	24(3)	3.40(1.47; 7.87)	15(3)	3.26(1.15; 9.23)	3.40(1.47; 7.87)	3.26(1.15; 9.23)
TB screen	TB-, no sign/screen	531(77)	1	373(76)	1	1	1
	TB+	156(23)	1.74(1.15; 2.62)	119(24)	1.63(1.03; 2.5)	1.63(1.03; 2.56)	1.63(1.03; 2.56)
OIs	OI-negative	456(63)	1	323(61)	1	1	1
	had ≥1 OI	273(37)	1.48(1.03; 2.1)	203(39)	2.04(1.37; 3.04)	2.04(1.37; 3.04)	2.04(1.37; 3.04)
CD4 (cells/μl)	>200	168(23)	1	120(23)	1	1	1
	150 - 200	157(22)	1.02(0.54; 1.95)	107(20)	1.73(0.88; 3.38)	1.02(0.54; 1.95)	1.73(0.88; 3.38)
	100 - 149	142(19)	1.85(1.02; 3.38)	107(20)	1.82(0.93; 3.55)	1.85(1.01; 3.38)	1.82(0.93; 3.55)
	50 - 99	157(22)	1.77 (0.98; 3.19)	109(21)	2.57(1.35; 4.89)	1.77(0.98; 3.19)	2.57(1.35; 4.89)
	<50	106(15)	4.36(2.41; 7.89)	83(16)	3.38(1.73; 6.60)	4.36(2.41; 7.89)	2.38(1.73; 6.60)
VL(RNA copies/μl)	<4 log10	43(6)	1	28(5)	1	1	1
	4 log10 - 5 log10	213(30)	1.42(0.47; 4.27)	161(31)	2.05(0.58; 7.22)	1.42(0.47; 4.27)	2.05(0.58; 7.22)
	>5 log10	464(64)	3.21(1.12; 9.18)	328(63)	3.50(1.03; 11.86)	3.21(1.12; 9.18)	3.21(1.12; 9.18)

*In the final multivariable model, a p-value of 0.1 significance level was considered.

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