Impacts of ART Initiation Policy Change on Integrated TB HIV Practice in Zomba, Malawi

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Abstract

Background: In response to emerging evidence for the safety and clinical benefit of early Antiretroviral (ART) initiation in tuberculosis (TB) patients, the National TB Programme (NTP) in Malawi implemented a change in policy for TB patients co-infected with Human Immunodeficiency Virus (HIV) in September 2011. Clinicians were advised to start ART as soon as possible, rather than delaying initiation until 2 weeks after starting TB treatment. We sought to assess the impact of the policy change on integrated TB HIV program measures and treatment outcomes in a TB HIV clinic at Zomba Central Hospital (ZCH).

Methodology: Routine program data from NTP TB registers and ART Clinic were collected and analyzed for all TB patients enrolled at ZCH April 1, 2011 to April 1, 2012. Univariate comparisons were made between groups enrolled 6 months prior to policy change implementation, and the subsequent 6 months.

Results: All 845 patients were included, 50.3% (n=425) pre, and 49.7% (n=420) post guideline change. No significant differences were found between groups in age, gender, type of TB (pulmonary/extra-pulmonary), or TB episode type (new/retreatment/relapse/failed/return after default). Program measures of TB HIV integration revealed more patients already on ART being diagnosed with TB in the post-guideline change group, 36.4% (n=153) vs. 30.4% (n=129), p=0.068. Of those not already on ART, rates of HIV testing exceeded 90% and were not different between groups. However, there was a significant improvement post-guideline in HIV positive TB patients initiating ART from 61.9% (n=96) to 73.6% (n=92), p=0.041. Furthermore, in those initiating ART, significantly more did so in less than 2 weeks, increasing from 35.4% (n=34) to 71.6% (n=63), p<0.001.

Conclusions: The national policy change from delayed to early as possible ART initiation in TB patients in Malawi was reflected in clinical practice in our clinic. More patients who tested HIV positive were successfully initiated on ART, and earlier. Increases in patients being diagnosed with TB already on ART were also found, raising the potential that changes in vigilance of TB diagnosis prior to ART initiation occurred as well. These changes did not appear to affect overall mortality. They do suggest an impact of health policy change on service delivery.

Background

- Over the last decade, several clinical studies have shown that starting ART early after the initiation of TB treatment can significantly reduce HIV progression and mortality [1-5].
- Despite emerging evidence, documentation in routine program settings in Africa with high rates of TB-HIV co-infection, suggest there has been suboptimal uptake of ART initiation after TB treatment initiation [6-9].
- The extent to which new evidence and changing clinical guidelines are translated into practice in this setting is incompletely understood.

- The National TB Programme (NTP) and Department of HIV and AIDS in Malawi (population 16.8 million; 10.8% adult HIV seroprevalence) implemented a change in policy for TB patients co-infected with Human Immunodeficiency Virus (HIV) as part of a national revision of HIV policy and practice [10].
- Training on the new guidelines by the Ministry of Health was rolled out nationally in September-October 2011, advising clinicians to start ART as soon as possible after starting TB treatment regardless of CD4 count; previous policy in the five years had been to wait 2 weeks to 2 months. ART Regimen was also changed from D4T/3TC/NVP to TDF/3TC/EFV [11].
- Previous data from Malawi, suggested that a pilot in 2 referral clinics, of the MOH policy to shorten the duration of ART initiation from 2 months to 2 weeks, increased the rates of ART initiation but that uptake remained sub-optimal at only 24% at 3 months after ART initiation [9].

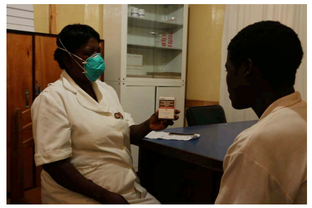

Figure 1. An ART nurse prescribes FDC TDF-3TC-EFV for an HIV-positive TB patient at the Zomba Central Hospital TB/HIV Clinic, Malawi

PURPOSE: This operational audit seeks to assess whether changes in national policy and guidelines were associated with changes in program practice measures and treatment outcomes in co-infected patients in routine program settings in Malawi

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Methodology

http://www.africa.upenn.edu/CIA_Maps/Malawi_19855.gif



Figure 2. Map of Malawi

- At Zomba Central Hospital (ZCH), a tertiary referral hospital for the SE Zone on Malawi (population 3.1 million), the Malawi MOH and Dignitas International have implemented co-located TB/HIV integrated services since 2007
- Registration for TB treatment occurs at ZCH but can be decentralized to one of over 30 primary health facilities for follow up; ART initiation and follow up may occur at ZCH or at the primary health facility level
- Routine program data from NTP TB registers and ART Clinic mastercards were digitized and entered into a customized Microsoft Access database for all 845 TB patients enrolled at ZCH April 1, 2011 to April 1, 2012.
- Data was extracted and analyzed using SPSS 21. Univariate comparisons were made between groups enrolled 6 months prior ("Pre"; n=425) to policy change implementation (October 2011), and the subsequent 6 months ("Post"; n=420)

Results

Summary of Demographic & TB Characteristics vs Guideline Change

			Guideline Change		Total	Total
			Pre	Post		P-Value
Age Group (Years)	0-14	Count (%)	46 (10.8%)	40 (9.5%)	86 (10.2%)	0.479
	15-24		39 (9.2%)	46 (11.0%)	85 (10.1%)	
	25-39		177 (41.6%)	194 (46.2%)	371 (43.9%)	
	40-59		130 (30.6%)	112 (26.7%)	242 (28.6%)	
	60+		33 (7.8%)	28 (6.7%)	59 (7.2%)	
Gender	Male	Count (%)	243 (57.2%)	238 (56.7%)	481 (56.9%)	0.881
	Female		182 (42.8%)	182 (43.3%)	364 (43.1%)	
PTB or EPTB	PTB	Count (%)	293 (68.9%)	303 (70.6%)	596 (70.5%)	0.307
	EPTB		132 (31.1%)	117 (27.9%)	249 (29.5%)	
TB Episode Type	Other Retreatment	Count (%)	34 (8.0%)	33 (7.9%)	67 (7.9%)	0.703
	Failed		0 (0.0%)	2 (0.5%)	2 (0.2%)	
	Return After Default		1 (0.2%)	1 (0.2%)	2 (0.2%)	
	Relapse		18 (4.2%)	20 (4.8%)	38 (4.5%)	
	New		372 (87.5%)	364 (86.7%)	736 (87.1%)	
Total		Count	425	420	845	
		%	50.3%	49.7%	100.0%	

Table 1. Similar baseline characteristics of TB/HIV co-infected patients "Pre" and "Post" guideline implementation at ZCH

Program Measures

- ***Table 1.*** shows that the baseline characteristics of co-infected patients "Pre" and "Post" guideline implementation was similar
- ***Table 2.*** shows there was a borderline significant difference of more patients already on ART being diagnosed with TB in the post-guideline change group, 36.4% (n=153) vs. 30.4% (n=129), p=0.068.
- In those not already on ART, rates of HIV testing exceeded 90% and were not different between groups in ***Table 2***.
- Post-guideline change, there was an overall 11.7% increase in HIV positive TB patients initiating ART while on TB treatment from 61.9% (n=96) to 73.6% (n=92), p=0.041
- In ***Figure 3***. those initiating ART, 36.2% more did so in less than 2 weeks, increasing from 35.4% (n=34) to 71.6% (n=63), p<0.001

Results

Overall TB HIV Program Outcomes vs Guideline Change

			Guideline		Total
			Pre	Post	
TB HIV Program Outcomes	On ART Before TB Treatment	Count	129	153	282
		%	30.4%	36.4%	33.4%
	HIV Tested Negative & Started ART	Count	115	119	234
		%	27.1%	28.3%	27.7%
	HIV Tested Positive & Started ART	Count	96	92	188
		%	22.6%	21.9%	22.2%
	HIV Tested Postive & Not Started ART	Count	59	33	92
		%	13.9%	7.9%	10.9%
	Not HIV Tested	Count	26	23	49
		%	6.1%	5.5%	5.8%
Total		Count	425	420	845
		%	100.0%	100.0%	100.0%



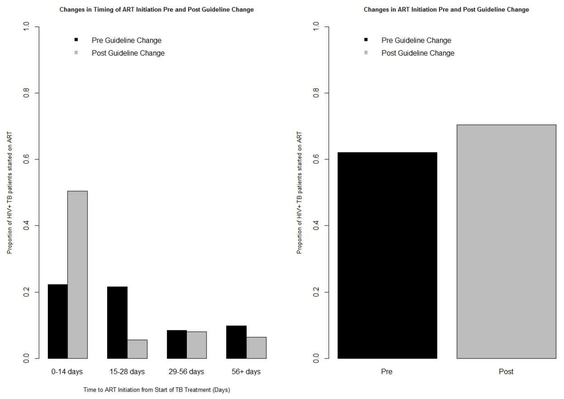

Figure 3. Co-infected patients were started earlier on ART and more patients were started on ART after the guidelines change

Treatment Outcomes

- ***Table 3.*** shows that no differences were found in overall mortality between those "Pre" and "Post" guideline change, or amongst subgroups of those already on ART, all those not on ART testing positive, those testing positive starting ART, and those testing positive who did not start ART.
- ***Table 4***. looked at mortality comparisons for the entire cohort between TB-HIV Program Outcome subgroups and HIV negative TB patients.

Table 3. No different in early treatment outcomes in co-infected patients "Pre" and "Post" guideline implementation at ZCH

TB Treatment Outcome Vs Guideline Change

			Guideline		Total	P-Value
			Pre	Post		
TB Outcome	Alive	Count	376	365	741	0.530
		%	88.5%	86.9%	87.7%	
	Dead	Count	46	48	94	0.827
		%	10.8%	11.4%	11.1%	
	Unknown	Count	3	7	10	0.221
		%	0.7%	1.7%	1.2%	
Total		Count	425	420	845	0.443
		%	100.0%	100.0%	100.0%	

Results

		Relative Risk & CI		
		RR	Lower	Upper
TB HIV Program Outcomes	On ART Before TB Treatment	1.936	1.146	3.271
	HIV Tested Positive & Started ART	0.968	0.495	1.895
	HIV Tested Postive & Not Started ART	2.120	1.116	4.025
	Not HIV Tested	1.327	0.517	3.402

Table 4. Relative risk of mortality in TB/HIV program subgroups compared with HIV negative TB patients



Conclusions

Program Measures

HIV Testing: Before and after policy change high rates of HIV testing among TB patients were maintained.
ART Initiation: Significantly more TB patients who tested positive were started on ART with their TB treatment
ART Timing: There was a shift in the timing of initiation after the policy change toward earlier initiation of ART.
OVERALL: Taken together, these data reflect findings of other studies [12,13] suggesting that the policy change to simultaneous ART initiation with TB treatment, along with accompanying training orienting staff, likely impacted practice patterns in our clinic, resulting in increased and earlier uptake of ART in our TB patients. Though other factors may have contributed, no other significant changes in our practice structure or staffing were identified that would have resulted in these changes.

Treatment Outcomes

Overall / New HIV+ Patients
- There was no differences found pre and post policy change in mortality in our patient population as a whole, or in newly identified HIV positive TB patients despite, the changes in practice.
- Improvements in early mortality would be expected based on previous studies, but many factors can influence the impact of changes in practice patterns on mortality in real world settings, including ART regimen change in this specific study.
- Further exploration with a larger sample powered appropriately may help clarify.

Existing ART Patients Developing TB
- Patients already on ART who were developing TB were growing in number, and also had twice the mortality of HIV negative patients, whereas TB patients newly diagnosed with HIV and subsequently started on ART had similar mortality to their HIV negative counterparts.
- We explored whether policy change might have led to less vigilance with TB screening prior to ART initiation, and by extension more TB Immune Reconstitution disease (TB diagnosed < 30 days after ART initiation). Our data did not support this. Further research to better understand the reasons for treatment mortality in this group is needed.

New HIV+ Patients Not Started on ART
- As expected, HIV positive patients who failed to start ART while on treatment had twice the mortality of HIV negative TB patients.
- This finding reemphasizes the need to continue improving uptake of ART among HIV positive TB patients.

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