ISID Grant Report

Integrating Tuberculosis and HIV services in rural Kenya: uptake and outcomes?

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Introduction

Kenya is one of the world's high Tuberculosis (TB)[1] and HIV burdened countries.[2] Though TB–HIV co-infected patients have higher mortality rates and increased risk of recurrent TB, early antiretroviral treatment (ART) and cotrimoxazole preventive therapy (CPT) improve their survival and outcomes.[3-10] Despite World Health Organization's (WHO) recommendation that all HIV-infected TB patients, irrespective of CD4+ cell count, be offered CPT and ART as early as 2 weeks and no later than 8 weeks following the initiation of anti-tuberculosis treatment[11] the uptake of ART among HIV-positive TB patients in Kenya was still low at 48% in 2010. One possible reason for this low uptake was the lack of linkage between TB and HIV services, with patients attending separate HIV and TB clinics at different locations.

In western Kenya, since early 2011, the Academic Model Providing Access to Healthcare (AMPATH, Eldoret, Kenya), in collaboration with the National Tuberculosis, Leprosy and Lung Disease Unit (NTLD, Nairobi, Kenya), had been rolling out integrated models of TB and HIV care in health facilities. Depending on the resources of the individual facility, we implemented one of three models: Model 1, where all TB, regardless of HIV status, and all HIV patients are seen under the same roof by the same staff; Model 2, where HIV-infected TB and all HIV patients are seen under the same roof by the same staff (non–HIV-infected TB patients are seen by separate staff in separate building); and Model 3, a strengthened referral model, where the TB clinic is moved next to the HIV clinic while staffing remains separate.

We hypothesised that such service integration in this rural, low-resource setting would lead to increased ART and CPT uptake, reduce the time to initiation of ART and improve TB treatment outcomes. Thus for the period before and after integration, we compared these parameters in 17 health facilities in rural western Kenya in relation to the 3 models.

Materials and Methods

This was a before-and-after cohort study carried out in 17 of the 35 main Ministry of Health clinics supported by AMPATH. Before integration, HIV and TB care were offered in vertical systems: AMPATH provided HIV services, while the NTLD provided TB care. Formal communication and interaction between the staff of the two services were limited. In practice, co-infected TB patients received clinical care, HIV testing, CPT, ART and TB drug refills as well as follow-up appointments at two separate clinics, and separate records were maintained. Patients lost to follow-up were traced independently based on different criteria. ART eligibility criteria for HIV-positive TB patients depended on the availability of CD4+ cell count. If this was unavailable, all HIV-positive TB patients were deemed eligible for ART; if available, those with CD4≤350 cells/mm3 were deemed eligible.

Integration involved the relocation of clinics under one roof or in close proximity, improved staff interaction and joint record keeping. TB clinics were moved into existing HIV clinics, as the HIV care system had better infrastructural and human resources. The district TB officer would visit the TB clinic every 2–3 weeks for mentorship, clinical care and reporting purposes. The 2010 WHO ART guidelines on early ART among all HIV-infected TB patients were implemented concurrently, as were feasible infection control measures.

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We selected all consecutive TB patients registered in the TB treatment registers between the periods March–October 2010 (pre-integration) and March–October 2012 (post-integration). Data was collected and analyzed using EpiData software (v3.1 for entry and v2.2.2.180 for analysis, EpiData Association, Odense, Denmark). We compared categorical variables using 2 or Fisher's exact tests and the t-test for continuous variables. Relative risks (RRs) were used to measure the strength of associations. Level of confidence was set at 95%. Ethics approval was received from the Moi University-MTRH Institutional Research and Ethics Committee and the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease, Paris, France. Permission for the study was also obtained from Kenya's NTLD.

Results and Conclusions

Of the 2,826 TB patients registered during the study periods, 689 (48.7%) co-infected individuals were identified pre-integration and 606 (46.5%) post-integration. HIV testing rates were respectively 95% and 98% (RR 1.04, 95% CI: 1.02–1.05, P<0.001). The baseline characteristics of the CPT- and ART-naïve HIV-co-infected TB patients were similar. After integration, CPT uptake significantly increased by 26.5% to reach 97.8% (RR 1.37, 95% CI: 1.30–1.46, P<0.001), while ART increased by 21.8% to reach 60.7% (RR 1.56, 95%CI 1.35–1.80, P<0.001).

Although Model 2, where only co-infected TB patients were integrated with HIV-positives, resulted in the highest ART uptake (66%), the differences with other models were not statistically significant (crude P=0.24, adjusted P=0.14).

Post integration, the median time to CPT initiation dropped significantly from 7 to 2 days, with a similar reduction in time to ART initiation, from 42 to 34 days. Model 2 resulted in a non-significantly earlier initiation of ART. Post-integration, significant numbers of patients who started ART did so within 8 weeks (68% vs. 57% pre-integration).

Overall TB success rates (among all TB patients) did not differ pre- and post integration (75% vs 72% respectively). Though Model 2 had slightly better treatment success compared to the other models this did not reach statistical significance. Other treatment outcomes did not differ statistically.

In conclusion, integration of TB and HIV services enhanced uptake and reduced delays in instituting CPT and ART in rural health facilities. The three models suggested differential uptakes in CPT and ART and in TB treatment outcomes. Policy implications were discussed.

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