Short Communication

Antiretroviral treatment uptake and attrition among HIV-positive patients with tuberculosis in Kibera, Kenya

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Summary Using data of human immunodeficiency virus-positive patients with tuberculosis from three primary care clinics in Kibera slums, Nairobi, Kenya, we report on the proportion that started antiretroviral treatment (ART) and attrition (deaths, lost to follow-up and stopped treatment) before and while on ART. Of 427 ART eligible patients, enrolled between January 2004 and December 2008, 70% started ART, 19% were lost to attrition and 11% had not initiated ART. Of those who started ART, 14% were lost to attrition, making a cumulative pre-ART and ART attrition of 33%. ART uptake among patients with TB was relatively good, but programme attrition was high and needs urgent addressing.

keywords attrition, human immunodeficiency virus, tuberculosis, antiretroviral treatment, Kibera, Kenya

Introduction

Human immunodeficiency virus (HIV)-positive patients with tuberculosis (TB) in sub-Saharan Africa have high death rates during and after TB treatment (Kelly *et al.* 1999; Harries *et al.* 2001; Mukadi *et al.* 2001). Antiretroviral treatment (ART) reduces mortality risk by 64–95% and is now recommended for all HIV-positive patients with TB (Lawn *et al.* 2006; WHO 2006; Tabarsi *et al.* 2009; Velasco *et al.* 2009). Between 2006 and 2009, the prevalence of HIV among patients with TB in Kenya ranged between 44% and 52% (MMWR 2001), and for such patients, ART is vital for survival. There are three public primary health care clinics in the informal settlement of Kibera in Kenya, which are supported by the Non-Governmental Organisation Medecins Sans Frontieres (MSF). These three clinics offer integrated TB and HIV services, and efforts have been made to offer ART to all HIV-positive patients with TB.

Using routine programme data of newly registered adult patients with TB who tested HIV positive and were considered eligible for ART, we report on (i) the proportion starting ART and (ii) attrition (deaths, lost to follow-up and stopped treatment) before and while on ART.

Methods

Design

Study design and setting population

This was a retrospective cross-sectional study using routine programme data conducted at three primary care clinics belonging to the Ministry of Health in Kibera, an urban slum setting in Nairobi with about 700 000 inhabitants. The three clinics are supported by MSF and HIV, and TB services are provided in the same health facility in an integrated manner and by the same clinician. All newly registered patients with TB presenting to the clinics between January 2004 and December 2008 and found to be HIV positive were included in the analysis.

ART for HIV-positive patients with TB

In Kenya, all HIV-positive patients with TB are eligible for ART but the timing of ART initiation relative to starting

TB treatment is based on CD4 cell count: patients with CD4 counts <200 cells/mm^3 start ART as soon as they are stabilized on TB treatment (usually between 2 and 8 weeks); patients with CD4 counts of 200–350 cells/mm^3 start ART on completion of the intensive phase of TB treatment (after 8 weeks) and those with CD4 counts over 350 cells/mm^3 start ART after completing TB treatment. Prior to starting ART, patients and guardians undergo group and individual counselling. A home visit is made by clinic staff before patients are started on ART. Patients with TB were seen weekly for the first 8 weeks of TB treatment and monthly thereafter. CD4 measurements coincided with TB clinic appointments.

The first-line ART regimen for co-infected TB patients in Kenya (NASCOP 2005) was a fixed-dose combination of stavudine (d4T), lamivudine (3TC) and efavirenz (EFV). ART was offered free of charge in Kibera.

Data collection, outcomes and analysis

The source of data is TB and ART patient cards and registers. Data were entered into an HIV/AIDS software program (FUCHIA; Epicentre, Paris, France) daily using standardized data collection sheets in the clinics.

Outcome data were for HIV-related variables including ART uptake and attrition before and after starting ART. On admission, height and weight were routinely measured to determine the body mass index [BMI; weight in kilograms (kg) divided by height in metre squared (m^2)]. A normal BMI was defined as 18.5–24.9 kg/m^2. Malnutrition was defined as a BMI <18.5 kg/m^2. Programme outcomes were defined as (i) alive and on follow-up (before or after starting ART): patient who was alive and on follow-up at the facility where he/she registered, (ii) lost to follow-up: a patient who was never been seen back at the ART facility for 6 months after the scheduled appointment date, (iii) died: a patient who died for any reason, (iv) stopped treatment: a patient who stopped ART for any reason, (v) transferred out: a patient who was formally and permanently transferred to another treatment facility. In this analysis, 'attrition' was defined as death, loss to follow-up or stopped treatment (if on ART) and as death or loss to follow-up (if not on ART). Patient outcomes were censored on 31 December 2008. Data analysis was carried out using STATA 8.2 software (Stata corporation, College Station, Texas 77845, USA).

Ethical approval

Ethics approval was received from the MSF and UNION Ethics Review Boards. The projects functioned within the framework of formal agreements with the Kenyan MOH. The data in this study did not include patient identifiers and constituted what was routinely collected as part of programme evaluation.

Results

A total of 465 newly registered patients with TB were HIV positive at their first visit, of whom 38 (8%) had missing outcome data and were excluded from the analysis. Of the 427 adults included, 56% were women, median age was 32 years (IQR, 28–38 years), 87% had pulmonary TB and 37% were malnourished. There were 6% who had never been to school, 63% with a primary education, 29% with a secondary education and 2% with a technical or university qualification.

Figure 1 shows follow-up outcomes for the 427 patients. Of these, 48 were retained in care and were still waiting to start ART at the time of data censoring, while 82 (19%) were lost to attrition prior to starting ART; 297 (70%) patients started ART, of whom 60 (14%) were lost to attrition while on ART. A cumulative total of 142 (33%) patients were lost to attrition either prior to or during ART, from the time they were considered eligible. A considerable proportion of attrition (58%) occurred prior to ART. Loss to follow-up, deaths and stopping ART constituted 73%, 25% and 2% of the total attrition, respectively. Pre-ART attrition was stratified by CD4 range (<200, 200–349 and >350 cells/mm^3, ranges that determine national guidelines on ART start time in relation to TB treatment), but no significant trend was observed. The analysis was limited by the fact that among those patients lost to attrition pre-ART, 43% had no record of a CD4 count most likely because it was never done.

Discussion

This study shows that, although about 7 of 10 HIV-positive patients with TB start ART in integrated TB-HIV clinics in Kibera, Kenya, more than 30% are lost to attrition either before or during ART. Over half of this attrition occurs in the pre-ART phase. Improving ART uptake among HIV-positive patients with TB is a high priority but a global challenge. By the end of 2007, only 100 000 (7.3%) of an estimated 1.37 million HIV-infected patients with TB worldwide were reported to have started ART (Harries *et al.* 2010). Thus, our study findings raise a number of important issues.

First, the relatively high uptake (69%) of ART in Kibera is very encouraging. However, attrition among patients with TB prior to and after starting ART remains unacceptably high. Second, nearly one in five patients (constituting 58% of all attrition) was lost to attrition

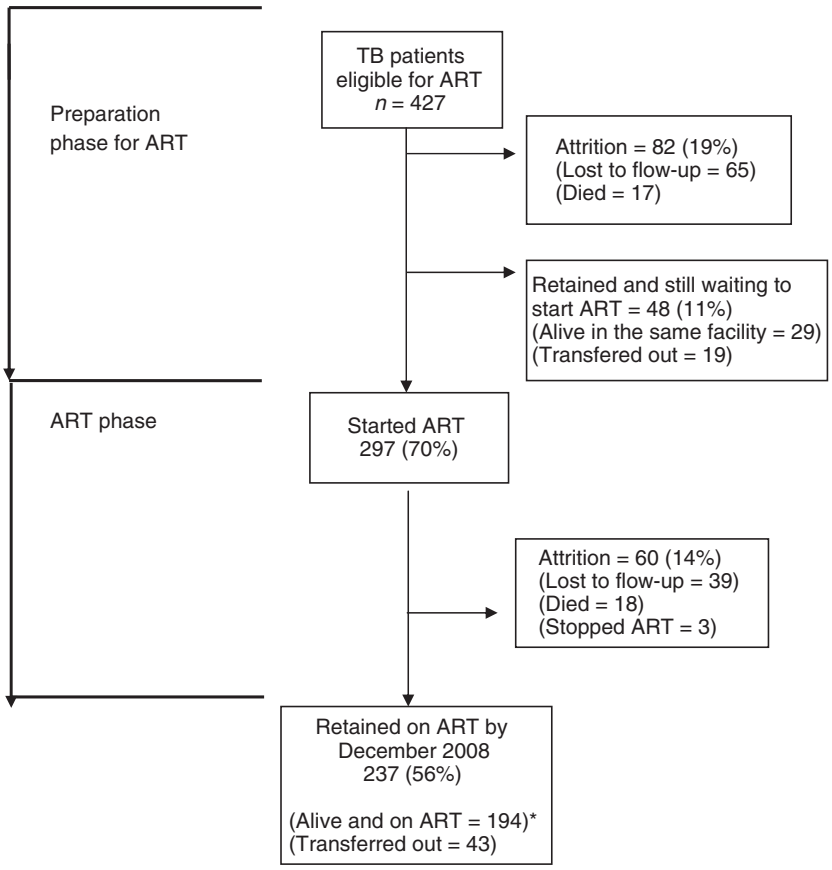

Figure 1 Cumulative retention and attrition among adult human immunodeficiency virus-positive patients with tuberculosis during the antiretroviral treatment (ART) preparation phase and after starting ART in Kibera, Kenya (2004–2008).
*In the same facility.

before starting ART. Possible reasons include patients feeling better after starting TB treatment and deciding not to return or postpone ART; possible unrecognized shortcomings in TB-HIV counselling; and CD4 turnaround time and death. Recent changes in WHO guidelines recommending that all HIV-positive patients with TB receive ART irrespective of CD4 count (WHO 2009) should help simplify the process of starting ART earlier, by removing the CD4 hurdle. Finally, this analysis highlights the need for programme reporting to include all ART 'eligible' patients, rather than just those patients started on ART, as 'on ART' analyses underestimate attrition and present a distorted picture of programme success.

Reducing attrition in co-infected TB patients would be helped by simplifying the process of ART initiation by implementing the new WHO guidelines (WHO 2009), better emphasis on the importance of starting ART early through more focused counselling and home visits prior to starting ART and activating existing systems to actively trace ART eligible patients (including those pre-ART) who fail to return for follow-up. The latter two points are currently being implemented and are likely to positively influence ART uptake. Finally, routinely reporting programmatic attrition in both the pre-ART and ART phase to better reflect overall attrition is needed.

The strengths of this study are that a relatively large number of ART eligible patients with TB were studied, outcomes were missing for only 8% of the cohort and, as the data come from a programme setting, findings likely reflect the operational reality on the ground. The limitations are that being an observational study, there may have been errors and omissions in recording, and patients declared lost to follow-up may include unascertained deaths. Although we do not have specific data to substantiate this, during the time of the study, the government of Kenya was relocating some of the population from Kibera, which may have affected the attrition rate. This aside, we do not know the exact reasons for attrition, and this merits further qualitative studies.

In an informal slum setting in Nairobi, Kenya, ART uptake among patients with TB is relatively good.

However, overall programme attrition is high, and ways forward for addressing this problem are urgently needed.

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