Can antiretoviral therapy contain a previously escalating TB epidemic in a high HIV prevalence community?

K Middelkoop[1]; R Wood[1]; L Myer[2,3]; E Sebastian[1]; LG Bekker[1]

[1]The Desmond Tutu HIV Centre, Institute of Infectious Diseases & Molecular Medicine & Department of Medicine, University of Cape Town
[2]Infectious Diseases Epidemiology Unit, School of Public Health & Family Medicine, University of Cape Town, Cape Town, South Africa
[3]Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, USA

Background

The World Health Organisation (WHO) recommended directly observed therapy short course (DOTS) strategies are failing to contain the tuberculosis (TB) epidemic in high HIV prevalence countries. Anti-retroviral therapy (ART) has been proposed as a possible strategy for controlling the TB epidemic in this setting[1] and substantial progress has been made in access to antiretroviral (ARV) drugs for patients in low and middle-income countries over the past few years. However, there are few population level insights into how the availability of ART may impact on TB rates in areas where HIV is prevalent.

Methods

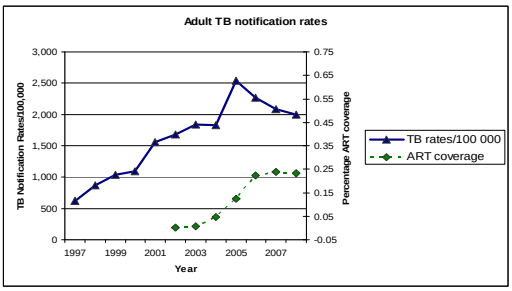
We monitored adult TB notifications in a South African community with 23% HIV prevalence and a well-functioning TB programme based on the WHO recommended DOTS strategy. Notification data was obtained from the local TB clinic from 1998-2004 (prior to ARV availability) and from 2004-2008 (following ARVs roll-out. Rates were calculated using population denominators from community census data. HIV-infected population size was determined from a multi-state model of HIV infection, with HIV incidence rates obtained from the ASSA2003 model, and assumptions about rates of transition between different HIV stages determined from a number of South African data sets .

ARV availability was scaled up in 2005, and by end 2008, an estimated 24% of the HIV-infected population was receiving ARV therapy.

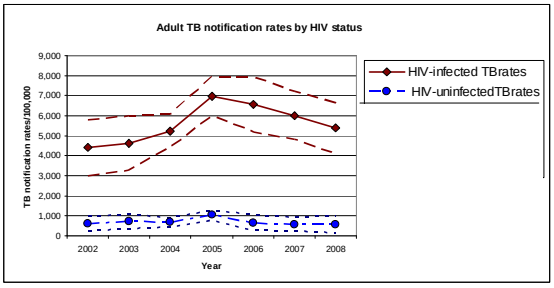
National TB program guidelines for diagnosis and management of TB patients have not changed significantly over the study period.

Results

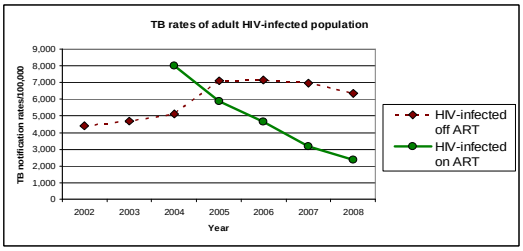
From 1997 to 2005 adult TB notification rates (per 100,000) increased by an average of 212 cases a year (p-value for trend = 0.005). From 2005, the rate of adult cases decreased by an average of 140 cases per year (p-value =0.16).



TB rates (per 100,000) in HIV-uninfected patients did not change substantially over the study period (p= 0.17 leading up to 2005; p=0.16 post 2005), with an average annual rate of 697 cases. However from 1997 to 2005, overall TB rates in HIV-infected adults increased by an average of 826 cases per year (p-value for trend = 0.08), after which rates decreased by 600 cases per year (p= 0.16).



TB rates (per 100,000) in HIV-infected patients not on HAART increased by an average of 860 cases per year from 2002 to 2005 (p-value for trend = 0.08), followed by an average decline of 421 cases per year; p-value for trend=0.16) (Figure 3a). TB rates in HIV-infected patients on HAART decreased at an average rate of 1,394 cases per year (p-value =0.05).



Conclusion

Wide-scale availability of ARVs, coupled with a well functioning TB program, appears to be associated with modest decreases in TB notifications in this community. The decrease in TB rates is predominantly in HIV-infected patients and particularly among HIV infected individual on ART.

[1]**World Health Organisation:** ***The Global Plan to Stop TB, 2006-2015 Stop TB Partnership*****, WHO Geneva, Switzerland. 2006.** http://www.stoptb.org/globalplan/plan

"Support for this study was provided by the US National Institute of Allergy and Infectious Diseases (NIAID) through the Comprehensive International Program of Research on AIDS (CIPRA) network, Grant U19 AI53217. The content of this presentation does not necessarily reflect the views or policies of NIAID, nor does mention of trade names, commercial projects, or organizations imply endorsement by the US Government."

Contact Dr K Middelkoop:
keren.middelkoop@hiv-research.org.za