

HIV testing rates and co-infection among patients with tuberculosis in south-eastern Sydney, 2008–2013

The proportion of people with known HIV status increased over time from 53% in 2008 to 87% in 2013

The association between HIV infection and tuberculosis (TB) is well recognised, and the rationale for offering a routine HIV test to all people with TB has been presented previously.¹ Recent clinical trials found that commencing antiretroviral therapy for HIV infection before the completion of TB therapy is associated with improved survival, and treatment should be commenced simultaneously for HIV and TB in people with co-infection and a CD4 T-cell count less than 50 cells/mm³.^{2,3} These recent clinical end point data reinforce the patient benefit of being tested for HIV infection when diagnosed with TB.

In Australia, HIV testing was undertaken in 76%–81% of patients with TB between 2008 and 2010.^{4,5} In 2010, 3.4% of patients with TB with a known HIV test outcome were reported as testing positive for HIV.⁵

South Eastern Sydney Local Health District (SESLHD) is a NSW Health district with a population of more than 800 000 people, and is an area of relatively high HIV prevalence and incidence in Australia.⁶ The district has four publicly funded chest clinics for the management of TB. At 53%, the rate of HIV testing among patients with TB managed in SESLHD in 2008 was statistically significantly lower than the national rate in 2008.

We evaluated changes in the HIV testing practices across the health district after a simple intervention and examined the rate of HIV co-infection in this population.

Methods

Clinicians managing publicly funded chest clinics had regular clinical meetings between 2008 and 2012. These meetings involved discussion of diagnosis and management of TB, and included senior respiratory physicians, senior nursing staff,

Abstract

Objective: To evaluate the rate of HIV and tuberculosis co-infection and changes in HIV testing practices for patients with tuberculosis managed in South Eastern Sydney Local Health District (SESLHD), New South Wales, Australia.

Design, participants and setting: A retrospective review of tuberculosis notification data from four public tuberculosis treatment clinics in SESLHD (population, > 800 000), 2008–2013. Data were extracted from the NSW Notifiable Conditions Information Management System.

Intervention: Published evidence regarding clinical management of HIV and tuberculosis co-infection and feedback of HIV testing rates was provided to senior clinicians managing tuberculosis in SESLHD between 2008 and 2012.

Main outcome measures: Proportion of patients with tuberculosis with HIV infection status ascertained and proportion with HIV co-infection.

Results: Of 506 people with notified tuberculosis treated in SESLHD during the study period, 369 had their HIV status ascertained (72.9%), of whom 20 were HIV co-infected (5.4%). Eleven of these cases were new HIV diagnoses. Seven people offered an HIV test declined the offer. The rates of HIV co-infection varied between clinics (1.5%–9.7%; $P = 0.02$) as did the rate of HIV status ascertainment (61.5%–85.4%; $P < 0.001$). The rate of HIV status ascertainment increased between 2008 and 2013 (52.9%–87.1%; $P < 0.001$).

Conclusions: The rate of HIV co-infection among people treated for tuberculosis in south-eastern Sydney is of clinical importance. Rates of HIV testing in this population have increased, but further gains are desirable. It is unclear if the intervention influenced the increase in HIV testing rates.

a microbiologist and an infectious diseases physician. Publications about HIV and TB co-infection were made available to the clinicians managing TB in the health district from 2008, and HIV testing data were fed back and discussed at clinician meetings.^{1–3,7,8} Cases of TB in SESLHD residents and others treated at SESLHD clinics were notified to the SESLHD Public Health Unit; these included microbiologically confirmed cases and cases that were treated for TB without microbiological confirmation. Data about patients' HIV testing status were collected routinely by chest clinic staff.

TB notification data for 2008–2013 were extracted from the NSW Notifiable Conditions Information Management System, accessed through the Secure Analytics for Population Health Research and Intelligence.

Variables extracted for analysis were date of notification for TB, name of treating chest clinic, local health district of residence, HIV test offered and HIV test result, including CD4 T-cell count for new diagnoses. For the analysis, HIV status was categorised as known (tested for HIV antibody and found to be positive, including known before the diagnosis of TB, or negative), or unknown (not tested or declined an offer of testing).

The χ^2 test was used to test for differences in the proportions of HIV testing and co-infection between clinics and over the study period. Statistical analyses were conducted using SPSS, version 22 (IBM Corporation) and SAS Enterprise Guide 6.1 (SAS Institute).

Ethics approval was not sought, as the data were aggregated and de-identified in a form suitable for feedback to clinical services as part of quality activities.

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Cases of tuberculosis managed in South Eastern Sydney Local Health District, 2008–2013, by patient HIV status and clinic or year of notification

	TB cases managed	HIV status known	HIV positive (of known HIV status)	HIV not tested	HIV test offered but declined
Clinic					
A	143	113 (79.0%)	11 (9.7%)	27 (18.9%)	3
B	213	131 (61.5%)	2 (1.5%)	79 (37.1%)	3
C	89	76 (85.4%)	6 (7.9%)	12 (13.5%)	1
D	61	49 (80.3%)	1 (2.0%)	12 (19.7%)	0
Year					
2008	85	45 (52.9%)	4 (8.9%)	39 (45.9%)	1
2009	80	56 (70.0%)	3 (5.4%)	20 (25.0%)	4
2010	100	79 (79.0%)	5 (6.3%)	21 (21.0%)	0
2011	98	72 (73.5%)	4 (5.6%)	24 (24.5%)	2
2012	73	56 (76.7%)	1 (1.8%)	17 (23.3%)	0
2013	70	61 (87.1%)	3 (4.9%)	9 (12.9%)	0
Total	506	369 (72.9%)	20 (5.4%)	130 (25.7%)	7 (1.4%)

Results

During the 6-year study period, 539 cases of TB were notified, and 506 of these were managed in SESLHD chest clinics (Box). Thirty-three SESLHD residents were managed at other chest clinics and were excluded from this analysis. Of the 506 patients treated at SESLHD chest clinics, 107 were not residents of SESLHD.

The proportion of patients tested for HIV co-infection varied between clinics from 62% to 85% ($\chi^2=25.5$; $df=3$; $P<0.001$), and the proportion of people with known HIV status increased over time from 53% in 2008 to 87% in 2013 ($\chi^2=27.1$; $df=5$; $P<0.001$).

Of patients for whom HIV status was known, the proportion of cases with HIV co-infection varied between clinics, ranging from 1.5% to 9.7% ($\chi^2=10.0$; $df=3$; $P=0.02$). Only seven people offered an HIV test declined this intervention in the 6-year period. The overall rate of HIV co-infection among people managed for TB in SESLHD was 5.4% of those in whom the HIV status was established. Based on these data, the lowest possible rate of co-infection is 4.0% if it is assumed that the 27.1% not tested were not infected.

Eleven of the 20 patients who were HIV positive were diagnosed with HIV infection at or after the time of their TB diagnosis. The median CD4 T-cell count at the time of HIV diagnosis for these people was 30 cells/mm³ (range, 10–250 cells/mm³).

Discussion

Between 2008 and 2013, there was an increase in the proportion of patients treated for TB for whom HIV status was known. Of these patients, 20 were HIV positive (5.4%), and 11 of these were diagnosed with HIV at the time of, or after, their TB diagnosis.

Although Australia has a low prevalence of both HIV and TB, the two conditions coexist worldwide, and the early diagnosis and treatment of both conditions is of benefit to the individual and the population as a whole. Recent data have confirmed the reduction of HIV transmission risk to sexual partners of people with HIV when antiretroviral therapy is used.⁹

The proportion of people diagnosed with advanced HIV infection (CD4 T-cell count less than 200 cells/mm³) has not declined over time in Australia, and HIV testing at the time

of TB diagnosis may enable earlier HIV diagnosis in a population who may not be perceived to be at risk for HIV infection otherwise.¹⁰ It is notable, however, that most of the newly diagnosed cases of HIV infection in SESLHD had severe immunodeficiency at the time of diagnosis. Treatment at this level of immunodeficiency is still associated with a survival benefit, and the potential to trace contacts of sexual partners and reduce further HIV transmission.

The increase in known HIV status over the study period may be associated with the clinician-led intervention described here or to other secular trends. Clinicians may have independently determined that HIV testing was of benefit to their patients, or they may have been responding to the 2009 NSW Health policy directive recommending assessment of HIV antibody status at the time of TB diagnosis.¹¹ Due to the retrospective nature of our study, causes for this increase could not be ascertained.

The proportion of TB cases with HIV co-infection in SESLHD is numerically, but not statistically significantly, higher than that reported in national data. The identified co-infection rates among people treated for TB in SESLHD reinforces the recommendation that the routine offer of HIV testing to all patients with TB is cost-effective, and may increase early detection and reduce the consequences of untreated HIV infection in this population.¹ It is possible, however, that referral bias may have influenced the co-infection rate in this population.

There is an ongoing need to aim for universal testing for HIV infection early after the diagnosis of TB in SESLHD and nationally.

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