People Born in Non–Main English Speaking Countries Are Less Likely to Start HIV Treatment Early in Australia: A National Cohort Analysis, 2014–15

To the Editors:

INTRODUCTION

In Australia, people born in Sub-Saharan Africa, South-East Asia, and North-East Asia have HIV diagnosis rates 2–4 times higher than people born in Australia,[1] and are more likely to be diagnosed late with a CD4 count <350 cells/μL.[1] Late presentation is associated with a significantly increased incidence of AIDS or death.[2] Once diagnosed, overseas-born people living with HIV (PLHIV) can face numerous linguistic, cultural, and financial barriers to linkage and retention into HIV treatment and care.[3]

Prompt diagnosis and treatment of HIV is beneficial both for individuals and for reducing onward transmission in the community.[4,5] Many studies in high-income countries have focused on late diagnosis among migrant PLHIV, but few on clinical pathways and outcomes after diagnosis with these populations. In Australia, there has only been one study comparing Australian-born HIV patients with those born overseas in high- or low/middle-income countries, which found no differences in routine monitoring of HIV infection, loss to follow-up or outcomes such as undetectable viral load,[6] but used a patient cohort who were treatment-experienced rather than newly diagnosed, with 30% excluded because country of birth information was missing.[6] A Canadian study also found foreign-born PLHIV were as likely as Canadian-born non-Aboriginal PLHIV on antiretroviral treatment (ART) to achieve virological suppression, but did not investigate differences between groups in the likelihood of being on treatment once diagnosed.[7]

Research to date in other high-income countries used patient data before 2014, before guidance was released internationally and in Australia recommending that ART be initiated in all adults living with HIV.[8,9] As of November 2013, all Australian citizens and residents diagnosed with HIV can access subsidized ART through the Pharmaceutical Benefits Scheme (PBS) irrespective of CD4 count.[10] The aim of this study—the first we are aware since universal ART guidelines were introduced—was to estimate the proportion of patients born in non–main English speaking countries and newly diagnosed with HIV in Australian sexual health clinics who had initiated treatment 6 months after diagnosis, compared with other patients.

METHODS

We used deidentified data from 43 publically funded sexual health services participating in the Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Blood Borne Viruses and Sexually Transmitted Infections (ACCESS) network in New South Wales, Western Australia, Victoria, Queensland, and the Northern Territory.[11] All patients diagnosed with HIV between January 1, 2014 and June 30, 2015 were included and categorized as "culturally and linguistically diverse (CALD)" or "other." CALD patients were those born in a country where English is not the main language spoken, in line with definitions used by government health and statistics bodies[12,13] and scientific literature showing that CALD populations have specific health care needs.[14] Other patients were born in Australia or a main English-speaking country, ie, United Kingdom, Republic of Ireland, New Zealand, Canada, and the United States.[12] Although designated as main English-speaking, South African–born patients were included in the CALD category because evidence suggests that they can face similar barriers to other CALD patients in accessing HIV services after migration to a high-income country.[15,16]

Patients were followed up for a maximum of 183 days (6 months) after diagnosis and assessed as having commenced treatment early if they had recorded ART initiation before this time. Patients were excluded from the primary analysis if they were recorded in the treatment file as accessing HIV management at another clinic.

Demographic and clinical variables were included in the analysis.[17] Missing values of viral load at diagnosis were imputed using ordinal logistic regression. Data on year of arrival variable were available but collinear with CALD patient status and excluded from further analysis.

The primary outcome was the proportion of patients in each group on treatment 6 months after diagnosis. The demographic profiles of CALD and other patients were compared using Pearson χ^2 test for categorical variables and Wilcoxon rank-sum test for median values. We explored differences in time to treatment by CALD status using Kaplan–Meier curves and log-rank tests. Univariate and multivariate Cox proportional hazards models stratified on treatment centre were used to assess unadjusted and adjusted associations with being on treatment 6 months after diagnosis. A model was also developed adjusting for the competing risk of loss to follow-up, and sensitivity analyses conducted: (1) including men who have sex with men (MSM) only, (2) excluding patients with incomplete follow-up (more than 6 months between clinic visits), and (3) including patients managed at other clinics, with these patients assigned late treatment status unless otherwise indicated on file. Only variables significant at the 5% in the level in the univariate analysis were included in the multivariate model. All events were censored on December 31, 2015.

Stata statistical software, version IC 14 (StataCorp, College Station, TX) was used for all analyses.

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The authors have no conflicts of interest to disclose.

TABLE 1. Association of Demographic and Clinical Factors With Being on Treatment 6 Months After HIV Diagnosis*†

	CALD	Other		Univariate Analysis			Multivariate Analysis		
	N (%)	N (%)	*P*	HR	95% CI	*P*	aHR	95% CI	*P*
CALD status									
Other		186 (65.1)		1	1 to 1		1	1 to 1	
CALD	104 (35.9)			0.66	0.45 to 0.95	0.026	0.53	0.36 to 0.78	0.002
Sex									
Men	87 (83.7)	182 (97.8)	<0.001	1	1 to 1				
Women	17 (16.3)	4 (2.2)		1.39	0.72 to 2.66	0.323			
Early treatment									
Yes	46 (44.2)	109 (58.6)	0.058						
No	58 (55.8)	77 (41.4)							
Age, yrs			0.003						
<30	46 (44.2)	68 (36.6)		1	1 to 1				
30–39	37 (35.6)	48 (25.8)		1.01	0.68 to 1.49	0.967			
40–49	17 (16.3)	36 (19.4)		0.97	0.62 to 1.520	0.891			
50+	4 (3.8)	34 (18.3)		0.60	0.34 to 1.08	0.088			
Median (IQR)	32 (25–38)	33 (25–45)	0.124						
Area of residence									
Major cities	93 (96.9)	149 (82.3)	<0.001	1	1 to 1				
Regional/remote	3 (3.1)	32 (17.7)		0.40	0.13 to 1.20	0.101			
Missing	8	5		0.25	0.07 to 0.87	0.030			
Region of birth									
Asia-Pacific	59 (56.7)			1	1 to 1				
Central/South America	21 (20.2)			0.73	0.34 to 1.57	0.426			
Europe	17 (16.3)			0.68	0.28 to 1.66	0.401			
Middle East and Africa	7 (6.7)			0.48	0.11 to 2.07	0.325			
Non-CALD	0 (0)	186 (100)		1.30	0.85 to 1.99	0.223			
Year of arrival									
<2006	22 (26.5)			1	1 to 1				
2006–2011	24 (28.9)			0.42	0.17 to 1.04	0.060			
2012+	37 (44.6)			0.53	0.25 to 1.15	0.109			
Missing/NA	21	186		0.65	0.27 to 1.54	0.326			
MSM									
Yes	70 (67.3)	146 (78.5)	0.036	1	1 to 1		1	1 to 1	
No	34 (32.7)	40 (21.5)		1.93	1.22 to 3.05	0.005	1.74	1.08 to 2.82	0.023
Recent IDU									
Yes	4 (3.8)	24 (12.9)	0.012	1	1 to 1				
No	100 (96.2)	162 (87.1)		1.13	0.68 to 1.90	0.632			
Hepatitis B coinfection									
Yes	2 (1.9)	5 (2.7)	0.684	1	1 to 1				
No	102 (98.1)	181 (97.3)		1.53	0.59 to 3.98	0.379			
CD4 at diagnosis, cells/μL			0.016						
<350	29 (32.2)	31 (20.3)		1	1 to 1		1	1 to 1	
350–499	23 (25.6)	32 (20.9)		1.55	1.02 to 2.36	0.042	1.80	1.17 to 2.78	0.008
500+	38 (42.2)	90 (58.8)		2.22	1.49 to 3.31	<0.001	2.79	1.84 to 4.21	<0.001
Missing	13	29		0.18	0.07 to 0.45	<0.001	0.18	0.07 to 0.46	<0.001
Median (IQR)	420 (303–555)	558 (381–706)	0.002						
Viral load at diagnosis									
<3.7	23 (29.9)	31 (21.5)		1	1 to 1				
3.7–4.6	21 (27.3)	34 (23.6)		1.14	0.69 to 1.89	0.612			
4.6.6–5.0	17 (22.1)	38 (26.4)		1.49	0.91 to 2.43	0.109			
>5.0	16 (20.8)	41 (28.5)		1.52	0.92 to 2.52	0.104			

TABLE 1. (*Continued*) Association of Demographic and Clinical Factors With Being on Treatment 6 Months After HIV Diagnosis*†

	CALD	Other		Univariate Analysis			Multivariate Analysis		
	N (%)	N (%)	*P*	HR	95% CI	*P*	aHR	95% CI	*P*
Missing	27	42							
Median (IQR)	4.51 (3.57–4.82)	4.64 (3.82–5.09)	0.133						

*Excludes 8 participants with treatment management at other clinics (3 CALD and 5 other).

†Includes 38 (36.5%) CALD patients and 50 (26.9%) other patients lost to follow-up at some stage in the first 6 months of the analysis ($P = 0.086$). These participants were assigned late treatment status in primary analysis. The adjusted hazards ratio for multivariate competing risks model for CALD patients was 0.55 (95% CI: 0.37 to 0.82), $P = 0.003$. The adjusted hazards ratio for a multivariate model excluding participants lost to follow-up was 0.64 (95% CI: 0.43 to 0.95), $P = 0.028$.

CI, confidence interval; HR, hazard ratio; IDU, injection drug user; IQR, interquartile range.

Ethics

The ACCESS Project received ethical approval from the human research ethics committees of Central Australia, St. Vincent's Hospital (Sydney), Cairns Hinterland Health Service District, Menzies School of Health Research, South Metropolitan Area Health Service District, Gold Coast Health Service District, the Alfred Hospital, the Princess Alexandra Hospital, and Townsville Health Service District.

RESULTS

Between January 1, 2014 and June 30, 2015, 290 patients were diagnosed with HIV at participating sexual health services—104 CALD and 186 other patients. CALD patients were younger, more likely to be female, reside in major cities, be heterosexual, and had a lower median CD4 count at diagnosis compared with other patients (Table 1).

By 6 months follow-up, the Kaplan–Meier estimates of being on treatment were 44.2% (95% CI: 35.3 to 54.2) for CALD patients and 58.6% (95% CI: 51.6 to 65.7) for other patients (log-rank test $P = 0.011$).

In the univariate Cox proportional hazards model, being a CALD patient, being MSM, and having a higher CD4 count at diagnosis were associated with a lower probability of having started treatment 6 months after diagnosis (Table 1). In the multivariate model, after adjusting for CD4 count at diagnosis and MSM status, CALD patients were still 47% less likely to have initiated treatment by 6 months after diagnosis (Table 1). When considering MSM only, CALD patients were 41% less likely to be on treatment at 6 months than other patients after adjusting for CD4 count (aHR 0.59, 95% CI: 0.38 to 0.93, $P = 0.023$). A model adjusting for competing risk of loss to follow-up (aHR 0.55, 95% CI: 0.37 to 0.82, $P = 0.003$) and sensitivity analyses excluding patients with incomplete follow-up (aHR 0.64, 95% CI: 0.43 to 0.95, $P = 0.028$) or including patients with recorded treatment at other clinics (aHR 0.52, 95% CI: 0.35 to 0.77, $P = 0.001$) produced similar results.

DISCUSSION

This is the first study we are aware of in a high-income country, after universal treatment recommendations, to consider differences in time between diagnosis and treatment initiation for HIV-positive persons born in a non–main English speaking country compared with persons born in Australia or another main English-speaking country. CALD patients were significantly less likely than other patients to have started ART at 6 months after diagnosis, irrespective of CD4 count.

These findings are consistent with previous studies in high-income countries concerning ethnic differences in HIV treatment initiation.[18–20] Income was an important correlate in some of these studies, but its' effect is likely to be attenuated in Australia, where sexual health services provide health care such as HIV testing to anyone free of charge and ART is subsidized for Australian citizens and permanent residents under the PBS. Some PLHIV in Australia, such as temporary visa holders, are ineligible for treatment subsidies; however, at least some are able to access ARTs through compassionate ACCESS schemes or state-based public health services including hospitals.[21]

Other factors causing delay in treatment initiation among HIV-positive CALD patients could include difficulty coming to terms with the diagnosis, compounded by the stigma which still surrounds HIV in some communities, and concern about what an HIV diagnosis might mean for their visa status.[14,21] Linguistic barriers and a lack of access to interpreter services can make it more difficult for health care providers to communicate to migrant patients, particularly those with limited English, about the individual and community benefits of starting ART early. Finally, indirect costs for example around transport and low levels of knowledge about the Australian health care system can also be impediments.[3,22]

This study has a few limitations. One, the sample size was relatively low and may have reduced the ability to accurately detect differences between migrant and nonmigrant patients and adjust for factors such as age, sex, exposure, and region of birth. Two, our study focused on sexual health clinics and findings may not be generalizable to CALD patients who receive care in other settings.

In summary, HIV-positive CALD patients at sexual health services are less likely than other patients to initiate treatment within 6 months of diagnosis. Reducing any financial barriers to access, increasing health literacy among CALD migrants, and health professionals' ability to communicate—in a culturally and linguistically appropriate way—the benefits of starting treatment early may be needed to reduce this gap.

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REFERENCES

1. The Kirby Institute. *HIV, Viral Hepatitis and Sexually Transmissible Infections in Australia Annual Surveillance Report 2016*. Australia, Sydney: The Kirby Insitute, UNSW; 2016.
2. Mocroft A, Lundgren JD, Sabin ML, et al. Risk factors and outcomes for late presentation for HIV-positive persons in Europe: results from the Collaboration of Observational HIV Epidemiological Research Europe Study (COHERE). *PLoS Med.* 2013;10:e1001510.
3. Mengesha Z, Dune T, Perz J. Culturally and linguistically diverse women's views and experiences of accessing sexual and reproductive health care in Australia: a systematic review. *Sex Health.* 2016;13:299–310.
4. Cohen MS, Chen YQ, Marybeth M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med.* 2011; 365:493–505.
5. Lundgren JD, Babiker AG, Gordin F, et al. Initiation of antiretroviral therapy in early asymptomatic HIV infection. *N Engl J Med.* 2015;373:795–807.
6. Tilley DM, Griggs E, Hoy J, et al; on behalf of the Australian HIV Observational Database (AHOD). Treatment and disease outcomes of migrants from low- and middle-income countries in the Australian HIV Observational Cohort. *AIDS Care.* 2015;27:1410–1117.
7. Lefebvre ME, Hughes CA, Yasui Y, Sanders LD, et al. Anteretroviral treatment outcomes among foriegn-born and Aboriginal peopls living with HIV/AIDS in northern Alberta. *Can J Public Health*. 2014;105:e251–e257.
8. World Health Organization. *Guideline on When to Start Antiretroviral Therapy and on Pre-exposure Prophylaxis for HIV*. Switzerland: World Health Organization; 2015.
9. Panel on Antiretroviral Guidelines for Adults and Adolescents. Initiating antiretroviral therapy in treatment-naïve patients. 2016; Available at: http://arv.ashm.org.au/arv-guidelines/initiating-art-in-treatment-naive-patients. Accessed March 9, 2017.
10. Pharmaceutical Benefits Advisory Committee. First-line anti-retroviral therapy (ART)—November 2013. 2013; Available at: http://www.pbs.gov.au/info/industry/listing/elements/pbac-meetings/psd/2013-11/first-line-art. Accessed March 9, 2017.
11. Guy RJ, Kong F, Goller J, et al. A new national Chlamydia Sentinel Surveillance System in Australia: evaluation of the first stage of implementation. *Commun Dis Intell Q Rep.* 2010;34:319–328.
12. Australian Bureau of Statistics. 3415.0-migrant data matrices, 2016: glossary. Available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3415.0Glossary12016?OpenDocument. Accessed February 1, 2017.
13. National Health and Medical Research Council. *Cultural Competency in Health: A Guide for Policy, Partnerships and Participation*. Canberra, Australia: Commonwealth of Australia; 2005.
14. Agu J, Lobo R, Crawford G, et al. Migrant sexual health help-seeking and Experiences of stigmatization and discrimination in Perth, Western Australia: exploring barriers and Enablers. *Int J Environ Res Public Health*. 2016;13:E485.
15. Thomas F, Aggleton P, Anderson J. "Experts," "partners" and "fools": exploring agency in HIV treatment seeking among African migrants in London. *Soc Sci Med (1982)*. 2010;70:736–743.
16. Thomas F, Aggleton P, Anderson J. "If I cannot access services, then there is no reason for me to test": the impacts of health service charges on HIV testing and treatment amongst migrants in England. *AIDS Care.* 2010;22: 526–531.
17. Australian Bureau of Statistics. *1216.0-Australian Standard Geographical Classification (ASGC)* July 2011. Available at: http://www.abs.gov.au/ausstats/abs@.nsf/mf/1216.0.
18. The Migrant Health Working Group for the Collaboration of Observational HIV Epidemiological Research in Europe (COHERE) in EuroCoord. Timing of combined antiretroviral treatment initiation in male and female migrants living in Western Europe. *AIDS.* 2017; 31:835–846.
19. The United Kingdom Collaborative HIV Cohort Study Group. Uptake and outcome of combination antiretorviral therapy in men who have sex with men according to ethnic group: the UK CHIC study. *J Acquir Immune Defic Syndr.* 2012;59:523–529.
20. McFall AM, Dowdy DW, Zelaya CE, et al. Understanding the disparity: predictors of virologic failure in women using highly active antiretroviral therapy vary by race and/or ethnicity. *J Acquir Immune Defic Syndr*. 2013;64:289–298.
21. Hermann S, Wardrop J, John M, et al. The impact of visa status and Medicare eligibility on people diagnosed with HIV in Western Australia: a qualitative report. *Sex Health.* 2012;9:407–413.
22. Jessup RL, Osborne RH, Beauchamp A, et al. Health literacy of recently hospitalised patients: a cross-sectional survey using the Health Literacy Questionnaire (HLQ). *BMC Health Serv Res.* 2017;17:52.