J Immigrant Health
DOI 10.1007/s10903-006-9015-9

ORIGINAL PAPER

Factors in the Delayed HIV Presentation of Immigrants in Northern California: Implications for Voluntary Counseling and Testing Programs

Vivian Levy · Diane Prentiss · Gladys Balmas · Sanny Chen · Dennis Israelski · David Katzenstein · Kimberly Page-Shafer

Abstract To describe the determinants of delayed HIV presentation in one Northern California County, the authors identify persons with an opportunistic infection (OI) at HIV diagnosis. From 2000–2002, a sample of HIV patients attending a public AIDS program ($n = 391$) were identified. Immigrants composed 24% of our sample; 78.7% of immigrants were Hispanic. Immigrants, compared to U.S.-born patients, presented with lower initial CD4+ counts at diagnosis than U.S.-born patients (287 cells/mm^3 vs. 333 cells/mm^3, $p = 0.143$), were more likely to have an OI at HIV diagnosis (29.8% vs. 17.2%, $p = 0.009$), and were more likely to be hospitalized at HIV diagnosis (20.2% vs. 12.5%, $p = 0.064$). We found only immigrant status was significantly and independently associated with delayed presentation. Interviews with 20 newly HIV diagnosed Hispanic patients suggest lack of knowledge regarding HIV risk, social stigma, secrecy and symptom driven health seeking behavior all contribute to delayed clinical presentation. The main precipitants of HIV testing for immigrants were HIV/AIDS related symptoms and sexually transmitted infection (STI)/HIV diagnosis in a sexual partner. These results support augmentation of STI/HIV voluntary clinical testing and partner notification services along the Mexico-California migrant corridor.

Keywords Immigrant · HIV · California · Mexico

V. Levy · D. Israelski · D. Katzenstein
Stanford University School of Medicine, Division of Infectious Diseases and Geographic Medicine,
Stanford, California, USA

V. Levy (✉) · D. Prentiss · G. Balmas · D. Israelski · D. Katzenstein
San Mateo County- San Francisco Peninsula AIDS Research Center, 222 West 39th Avenue San Mateo,
CA 94103, California, USA
e-mail: vlevy@stanford.edu

S. Chen
San Francisco Department of Public Health,
San Francisco, California, USA

K. Page-Shafer
Department of Medicine, Center for AIDS Prevention Studies,
University of California San Francisco,
San Francisco, California, USA

Introduction

Immigrants to the U.S. encounter barriers in accessing health care for a variety of reasons [1–3]. In the case of HIV, later diagnosis postpones access to antiretroviral treatment (ART) and prophylaxis and increases the likelihood of further chains of HIV transmission through prolonged undiagnosed HIV infection and untreated viremia.

The objectives of this study were to determine if immigrants present later for care compared to other HIV infected persons in San Mateo County, located in northern California, and to describe the possible reasons for delayed presentation as identified in interviews with recently HIV diagnosed Hispanics. An understanding of the causes of delayed presentation may be used to enhance prevention programs for immigrants in California.

With a population that is 26% foreign-born [4], California has been at the center of national discourse on issues of health and immigration. In 1994, California voters approved Proposition 187 which required publicly funded health care facilities to deny care to undocumented immigrants and to report these immigrants to government officials [5]. The implementation of Proposition 187 was forestalled by legal challenges and invalidated by federal courts one year after the ballot initiative was passed by voters [6].

Nationally, the U.S. Congress enacted a ban in 1987 including HIV/AIDS as a "communicable disease of public health significance" and prohibiting all HIV infected immigrants from entering the U.S. [7]. HIV infected immigrants face significant problems in remaining legally in the U.S., although some immigrants may be eligible for a "waiver" of the exclusionary policy from the Department of Homeland Security [8].

Methods

Study site

San Mateo County, a northern California county of 707,000 persons with a median household income of $70,800 [9] is 49.7% White (non-Hispanic), 21.8% Hispanic, 21.3% Asian Pacific Islander and 3.4% African American. One third (32.3%) of the county's residents are foreign-born [10], 34% of San Mateo County's immigrants report Hispanic ethnicity [11]. All HIV infected patients with an address of residence in San Mateo County are eligible to receive treatment services at the publicly funded San Mateo County AIDS Program (hereinafter called the AIDS program). As a public program, patients served, both immigrant and U.S.-born, have lower incomes than the county median income. The racial and ethnic composition of patients in San Mateo's public health system is different from that of the overall population in San Mateo due to socioeconomic selectivity. In our sample of HIV infected immigrants, 78.7% were Hispanic.

HIV infected persons enter the AIDS program in one of two ways: 1) An outpatient visit to one of three county HIV clinics or 2) An inpatient stay at the county hospital related to HIV. On entry into the AIDS program, a standardized medical intake is conducted on all patients. Each patient receives a standardized physical examination and routine phlebotomy for HIV antibodies using the screening enzyme-immunoassay (EIA), HIV Western Blot, complete blood count, chemistry profile, T cell subset and HIV viral load. All HIV infected patients receive comprehensive HIV care from a board certified infectious diseases specialist affiliated with the Stanford University Division of Infectious Diseases in Stanford, California during regularly scheduled clinic visits. Antiretroviral agents available to patients include all current U.S. Food and Drug Administration approved therapies.

Study design

Active HIV patients in the San Mateo County AIDS Program between January 2000 and March 2002 were identified retrospectively from two sources: 1) County hospitalizations using the active surveillance modality of ICD-9 discharge review for HIV/AIDS and opportunistic infections (OIs) codes; and 2) a clinical database compiling outpatient visits from three public health care clinics between January 2000 and March 2002. ICD-9 codes were used as an initial screen to identify HIV and OI related hospitalizations. A physician reviewed all medical records from the ICD-9 screening to verify documented HIV infection and establish the cause of hospitalization. CD4 + T cell counts and evidence of OIs at HIV diagnosis were included for analysis.

As most immigrants in our HIV infected sample report Hispanic ethnicity, we conducted in depth interviews with 20 newly HIV diagnosed Hispanic patients presenting for care to the AIDS program between October 2002 and October 2003. Patients who self identified as Hispanic and were diagnosed with HIV infection within the past 12 months were consecutively recruited to be interviewed. Interviews were conducted in English or Spanish based on subject preference. Interview participants underwent a written consent procedure prior to interview. The interview instrument was translated into Spanish and then back translated into English by a second bilingual outreach worker to verify content. Interview participants were reimbursed $20. This protocol was conducted with the approval of the Institutional Review Board of the San Mateo Medical Center. A certificate of confidentiality was obtained for this study from the U.S. National Institutes of Health.

The interview included items pertaining to sociodemographic characteristics including gender, age, country of origin, education level, marital and parenting status. Migration related characteristics considered included age first entered U.S., age most recently entered U.S., and sources of sponsorship of migration, housing and employment in the U.S. Characteristics pertaining to sexually transmitted infections (STIs)/HIV included sources of knowledge regarding STIs/HIV, prior history of STI testing or treatment or HIV testing and sexual and drug using risk behaviors.

Definitions

We use the term immigrant to encompass both individuals from outside the U.S. who come to live and/or work in the U.S. for time limited stays (migrant) or with the intention of permanent settlement (immigrant) [12]. Hispanic ethnicity was self reported by patients at time of entry into the AIDS program. Monolingual status was defined as those non-English speaking persons requesting interpreter services for clinical visits. Racial/ethnic differences were analyzed for non-Hispanic white (hereinafter called white), non-Hispanic black (hereinafter called black), and Hispanic.

HIV seropositive status was defined by a repeatedly positive EIA test with confirmatory Western blot. Delayed HIV presenters were defined as persons first diagnosed with HIV concurrently with an OI as defined by 1993 Centers for Disease Control and Prevention (CDC) criteria [13]. First diagnosis of HIV among delayed presenters was verified

by physician review of all outpatient and inpatient medical records (U.S. and non-U.S.) and when possible, interview with delayed presenters.

Results

Demographic variables and risk of delayed HIV presentation.

Table 1 summarizes demographic and clinical parameters at HIV presentation for immigrant and U.S.-born patients entering the AIDS program ($n = 391$). The majority of immigrants (78.7%) were Hispanic, and of these, most were of Mexican origin.

Compared to U.S.-born patients, immigrants presented with lower initial CD4 + counts at diagnosis than U.S.-born patients (287 cells/mm^3 vs. 333 cells/mm^3, $p = 0.143$), were more likely to have an OI at HIV diagnosis (29.8% vs. 17.2%, $p = 0.009$), and were more likely to be hospitalized at HIV diagnosis (20.2% vs. 12.5%, $p = 0.064$).

Multivariate analyses

Table 2 shows variables found to be independently associated with delayed HIV presentation among all persons entering the AIDS program. Table 3 shows variables found to be independently associated with delayed HIV presentation among Hispanic persons entering the AIDS program. All of the independent variables entered into the multivariate model are represented in Tables 2 and 3.

We found only immigrant status was significantly and independently associated with delayed HIV presentation in Table 2. For Hispanics entering the AIDS program, the odds of delayed clinical presentation among immigrants were > 6 times higher than U.S.-born Hispanics (Table 3). As the number of U.S.-born Hispanics in our sample is small, the 95% CI for this OR includes 1.

Table 1 Demographic characteristics, CD4+ count at entry into AIDS program and prevalence of opportunistic infections (OIs) at HIV diagnosis among immigrant and U.S.-born patients in the San Mateo County AIDS program, Northern California 2000–2002 ($n = 391$)

Variable	Immigrants ($n = 94$) N(%) or median (IQR)	U.S.-Born[a] ($n = 297$) N(%) or median (IQR)	p-value
Male[b]	71 (75.5%)	219 (73.7%)	0.649
Median age	31 (27–38)	35 (29–41)	0.001
Hispanic ethnicity	74 (78.7%)	20 (6.7%)	<.001
Monolingual (non-English)[c]	66 (70.2%)	1 (0.34%)	<.001
Country of birth			
Mexico	57 (61.3%)		
Central America	13 (14.0%)		
Asia	12 (12.9%)		
Other	11 (11.8%)		
Mean initial CD4 + count	287 cells/mm^3	333 cells/mm^3	0.143
Prevalence of OIs	28 (29.8%)	51 (17.2%)	0.009
Hospitalizations ($n = 59$)	19 (20.2%)	37 (12.5%)	0.064

[a]U.S.-Born includes 4 persons born in Puerto Rico.

[b]Excludes 2 transgender persons.

[c]Monolingual is defined as non-English speaking persons requesting interpreter services for clinic visits.

Table 2 Independent associations with opportunistic infection (OI) at first HIV diagnosis (multivariate analysis) for 391 patients entering San Mateo County AIDS Program, California 2000–2002

	Adjusted OR (95% CI)
Immigrants	2.98 (1.21–7.38)
Monolingual status	1.17 (0.40–3.43)
Hispanic	0.51 (0.19–1.34)

Interviews

Interview data were examined for themes using content analysis [14]. Three research staff members coded the textual data independently to triangulate emergent themes. Illustrative quotes were selected to highlight recurrent themes.

Most subjects interviewed were male immigrants from Mexico or Central America (18/20) who were married (13/18) at the time of interview. Almost half of the subjects (9/20) had not completed secondary school.

The majority of immigrants interviewed came to the U.S. as labor migrants. Most immigrants first arrived in the U.S. in early adulthood (median age 23 years), and returned to their country of origin for prolonged stays (median duration of return trip to home country 8 months). As one man said,

> *"Even if I come here to wash plates for $6.00 an hour, I earned that in a day back home. Only in a country like this can I come out ahead. The dream is to come here." Another commented, "In Mexico, with 50 pesos you can only buy a kilo of beans, here with $50 we can eat for two weeks."*

Migration sponsorship to the U.S. as well as housing and employment in the U.S. occurred through a shared binational

Table 3 Independent associations with opportunistic infection (OI) at first HIV diagnosis (multivariate analysis) for Hispanic patients ($n = 94$) entering San Mateo County AIDS Program, California 2000–2002

	Adjusted OR (95% CI)
Immigrants	6.33 (0.58–69.68)
Monolingual status	1.22 (0.30–5.06)

social network. One man's account typified the interrelationship of these social networks:

> *"I crossed through Tijuana with three friends from my state at age 23. I knew them from my hometown. A friend who was already in northern California from my hometown paid $2,000 for the crossing. This is someone who did it out of respect for my family. We have the same last name; we are almost like family. When I arrived in northern California, I lived in an apartment with 8 other men from my hometown. They helped me find a job and helped me bring my brother."*

Almost half of subjects (9/20) were legally undocumented in the U.S. at the time of interview.

The chief precipitants for HIV testing were symptoms related to HIV/AIDS (7/20) or being the sexual partner of someone recently diagnosed with a STI/HIV (7/20). Half (10/20) of the subjects presented with an OI at time of initial HIV diagnosis. Various interview subjects who had not been HIV tested previously attributed their lack of prior testing to an absence of symptoms. One man remarked, "*I felt fine. I had no problems. I had no reason to go to the doctor*."

Some interview respondents believed their risk of contracting HIV was non-existent. One male respondent remarked, "*I have no idea how I was infected with this. I am a clean, honest person*." Though STI/HIV knowledge was not assessed in detail, 12/20 subjects stated that they had little to no general understanding of STIs. One female patient from rural Mexico who denied any prior knowledge of STIs until her HIV diagnosis commented, "*We lived too isolated . . . I had never had sex with anyone until I married my husband*." Two subjects lacked any knowledge of basic HIV transmission modes, "*How did I get this? Can I pass it on to my children?*"

Lack of knowledge relating to HIV risk was not the only barrier to earlier HIV testing. Stigma emerged as a salient theme around HIV disclosure as well as many different aspects in the lives of the interviewees. One bisexual identified man remarked, "*I ask God why he made me like this . . . why not a real man without these sexual preferences so I do not have to be experimenting like this*." An HIV diagnosis often led to shunning and the severing of family ties. One man who arrived in Northern California at age 19 and had a wife and son in Mexico, commented, "*Since I told my family I have HIV, my wife's family does not talk to me. They do not dress my son with the clothes I send him*." Another man who presented with early HIV and had a good prognosis with antiretrovirals remarked, "*My wife moved to another state. She told my daughter I am dead*." One man who presented with late stage AIDS and died one month after entering the AIDS program, commented, "*My family (in Northern California) wants me to return to Central America. Here no one is supporting me to stay. But, I know this is where I have to stay*."

The sexual history was limited in identifying men who have sex with men (MSM) and sexual partners of HIV infected persons. Ten patients had been previously HIV tested prior to their most recent positive test; seven were men who reported MSM behavior. The remaining three previously tested subjects were men who were HIV tested under what may have been perceived as compulsory settings (i.e. legalization of immigrant status, incarceration, and drug treatment). One heterosexual-identified man remarked, "*Aside from immigration requirements, I would not have been tested. I was without symptoms*." Marital or parenthood status of patients implied little regarding HIV risk. Of the 18 men, 13 had female partners at some point in their lives. Only 30% of men (6/18) had not been previously married and had no children.

Discussion

Our findings of delayed HIV presentation in immigrants is consistent with results of previous studies showing delayed clinical presentation in U.S. Hispanics [15, 16] and Asian Americans and Pacific Islanders [17, 18]. These studies did not distinguish U.S.-born from foreign-born minorities. We found that immigrants were significantly younger, more likely to present with indicators of more advanced HIV disease, including OIs, had lower CD4 counts and were more likely to be hospitalized at HIV diagnosis than U.S.-born patients. Immigrant status emerged as the most important variable associated with delayed HIV presentation among Hispanics in our sample.

Data on median age at immigration (23 years) and median duration in the U.S. (12 years) prior to HIV diagnosis among those interviewed, suggest that immigrants in our sample were likely infected in their first decade in the U.S. A large unlinked HIV serosurvey in Los Angeles County [19] reported similar age parameters among HIV infected Mexican and Central American clients (age at HIV diagnosis 32.4 years, age at immigration to U.S. 20.7 years and median number of years since immigration 12 years), leading those authors to propose that most of this foreign-born HIV infected group were infected after immigration to the U.S. These results are also supported in analyses of AIDS case data in Los Angeles [20] where 64% of foreign-born Hispanic persons with AIDS had lived in the U.S. for more than 10 years prior to HIV diagnosis. However, determining the country of infection must take into consideration return trips of prolonged stays to the country of origin.

From prevention and clinical perspectives, providers should consider the risk factors not only for individual behaviors but also population factors related to immigrant

status. Migration results in increased sexual mixing of different groups, altered sex ratios of young adults (ratio of men to women) and social disruption that may discourage long term stable partnering patterns [21–23]. Others have described substantial differences between gay identified men and heterosexually identified MSM on variables relevant to AIDS prevention [24]. While we recently reported English language proficiency was predictive of ever having been HIV tested in a household probability sample of immigrant men from three California counties [25], in this clinic based study, lack of English language proficiency was not associated with greater risk of delayed HIV presentation.

Our interviews show deficits in HIV knowledge and evidence of stigma related to immigrant and MSM status. Other investigators have reported knowledge deficits of HIV transmission and poor knowledge of condom use by Mexican migrant laborers in the U.S. [26, 27]. Stigma has been previously reported [28] as contributing to delayed HIV presentation. We theorize that immigrant lack of HIV knowledge and stigma are transformed into significant risk factors for HIV delayed presentation when immigrants move from a low prevalence HIV area such as rural Mexico to a higher prevalence HIV area such as Northern California.

Our study has some limitations. The sample size is modest and is limited to a Northern California public AIDS program. Therefore, it may not be generalizable to other AIDS programs. We view the significance tests cautiously, since our sample is a 100% sample of persons presenting for treatment in our county, not a probability sample of a wider population. Legal status was not obtained for most subjects in this study. The effect of undocumented legal status on HIV delayed presentation in California's immigrants is unknown. Compared with other ethnic groups in California, Latinos are more likely to cite citizenship or immigration issues for lacking health insurance and as a primary barrier to care [29]. Tuberculosis infected persons in Los Angeles (predominantly Hispanic) reported immigration status as a deterrent for seeking medical care [30].

Considering these data, we support the development of policies for augmenting bilingual STI/HIV voluntary counseling and testing (VCT) and partner notification services along the Mexico-California migrant corridors as has been proposed by others [31, 32]. Clinical providers need to be educated that immigrants may not often disclose MSM behavior or request HIV testing, and that testing needs to be considered for all immigrants with a STI. While most HIV infected immigrants in California are eligible for the AIDS drug assistance program (ADAP) regardless of their legal status, many immigrants may not realize they have access to HIV treatment in the U.S. Campaigns promoting VCT for U.S. immigrant populations need to emphasize effective, accessible treatment is available. HIV testing needs to be normalized in California's immigrant populations and provided as part of the gamut of services by agencies working with recent immigrants.

Earlier HIV diagnosis will benefit not only infected individuals but also their sexual partners in the U.S. and their countries of origin. Recent immigrants are a marginalized population in society with little political influence, linguistic isolation, and impaired access to basic health care services. We support further research to examine innovative approaches to promote VCT and partner notification efforts in U.S. immigrant communities.

Acknowledgments Funding for Dr. Levy provided by the University wide AIDS research program of the University of California, Grant number CF02-SMCHC-300. We acknowledge the following for their contributions and invaluable assistance in this research. Sarah Cottrell (San Mateo Department of Public Health), the staffs of the San Mateo County AIDS Program and the Department of Medical Records at the San Mateo Medical Center. We thank David Bangsberg and Dave Huebner for their comments on earlier versions of this work. Lastly, we thank all the patients whose participation and feedback made this research possible.

References

1. Shedlin M, Shulman L: Qualitative needs assessment of HIV services among Dominican, Mexican and Central American immigrant populations living in the New York City area. AIDS care 2004; 16:434–445
2. Garbers S, *et al*.: Barriers to breast cancer screening for low-income Mexican and Dominican women in New York City. J Urban Health 2003; 80:81–91
3. Rivadeneyra R, *et al*.: Patient centeredness in medical encounters requiring an interpreter. Am J Med 2000; 108:470–474
4. United States Census Bureau: 2000 U.S. Census Tables P1, P21, PCT19. Washington, DC. Available at: www.census.gov
5. Ziv TA, Lo B: Denial of care to illegal immigrants-Proposition 187 in California. N Engl J Med 1995; 332:1095–1098
6. Ayres Jr B: Californians pass measure on aliens; courts bar it. The New York Times 1994; November 10
7. Frankel DH: USA: Senate vote on HIV-infected immigrants. Lancet 1993; 341:621
8. Webber DW: HIV/AIDS legal issues in the United States. Can HIV/AIDS Policy Law Rev 2000; 5:38–41
9. United States Census Bureau: 2000 U.S. Census Summary File 3, Table P53. Washington, DC. Available at: www.census.gov
10. United States Census Bureau: 2000 U.S. Census Tables P1, P6, P7 and P22. Washington, DC. Available at: www.census.gov
11. Ruggles S, *et al*.: Integrated Public Use Microdata Series: Version 3.0. Minneapolis, Minnesota: 2004
12. Organista KC, *et al*.: HIV Prevention with Mexican Migrants: Review, Critique and Recommendations. JAIDS 2004; 37:S227–S239
13. Centers for Disease Control and Prevention: 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992;41
14. Green J, Thorogood N: Qualitative methods for health research. London: Sage Publications; 2004
15. Turner B, *et al*.: Delayed medical care after diagnosis in a US national probability sample of persons infected with human immunodeficiency virus. Arch Intern Med 2000; 160:2614–2622

16. Centers for Disease Control and Prevention: Late versus early testing of HIV–16 sites, United States, 2000–2003. MMWR 2003; 52:581–586
17. Wong F, *et al*.: HIV testing and awareness of care-related services among a group of HIV-positive Asian Americans and Pacific Islanders in the United States: findings from a supplemental HIV/AIDS surveillance project. AIDS Educ Prev 2004; 16:440–447
18. Eckholdt H, Chin J: Pneumocystis carinii pneumonia in Asians and Pacific Islanders. Clin Infect Dis 1997; 24:1265–1267
19. Harawa NT, *et al*.: HIV prevalence among foreign- and US- born clients of public STD clinics. Am J Public Health 2002; 92:1958–1963
20. Los Angeles County Department of Health Services, HIV Epidemiology Program: An Epidemiological Profile of HIV and AIDS in Los Angeles County. Los Angeles, CA: Los Angeles Department of Health Services; 2000
21. Decosas J: Labour migration and HIV epidemics in Africa. AIDS Annals of Africa 1998; 8:6–7
22. Entz A, *et al*.: HIV-1 prevalence, HIV-1 subtypes and risk factors among fishermen in the Gulf of Thailand and the Andaman Sea. AIDS 2000; 14:1027–1034
23. Lacerda R, *et al*.: Truck drivers in Brazil: prevalence of HIV and other sexually transmitted diseases, risk behavior and potential for spread of infection. AIDS 1997; 11:S15–S19
24. Diaz R: Latino gay men and HIV: culture, sexuality and risk behavior. New York: Routledge; 1998
25. Levy V, *et al*.: HIV-related risk behavior among Hispanic immigrant men in a population-based household survey in low-income neighborhoods of Northern California. Sex Transm Dis 2005; 32:487–490.
26. Organista KC, *et al*.: Survey of condom related beliefs, behaviors, and perceived social norms in Mexican migrant laborers. J Community Health 1997;22:185–198
27. Organista KC, Organista PB: Migrant laborers and AIDS in the United States: A review of the literature. AIDS Educ Prev 1997; 9:83–93
28. Castro A, Farmer P: Understanding and addressing AIDS-related stigma: From anthropological theory to clinical practice in Haiti. Am J Public Health 2005; 95:53–59
29. Brown E, *et al*.: The state of health insurance in California: Findings from the 2001 California Health Interview Survey. Los Angeles, CA: UCLA Center for Health Policy; 2002
30. Asch S, *et al*.: Does fear of immigration authorities deter Tuberculosis patients from seeking care? Western J Med 1994; 161:373–376
31. Bozzette S, *et al*.: The care of HIV infected adults in the United States: results from the HIV Cost and Services Utilization Study. N Engl J Med 1998;339:1897–1904
32. Solorio MR, *et al*.: HIV Health Care Services for Mexican Migrants. JAIDS 2004; 37:S240–S251