



International HIV Mobility: Implications for the Sexual Spread of Antiretroviral Drug Resistance among MSM



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BACKGROUND

Introduction

- San Francisco is an epicenter for the HIV epidemic among men who have sex with men (MSM).
- Sexual networks that extend across international borders may facilitate the spread of new HIV strains and drug-resistant mutations.

Objectives

- To evaluate the potential for HIV mobility among MSM in San Francisco with newly-diagnosed HIV infection.
- To identify recent HIV-1 infections.
- To assess the prevalence of HIV-1 strain variation and antiretroviral resistance.

METHODS

Study Design

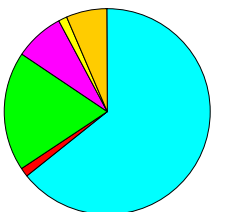
- Subjects
 - Newly-diagnosed HIV-infected MSM
 - Recruited from HIV testing sites and early care clinics
 - From 1999 through 2001
 - N = 64 participants
- HIV Exposure Period
 - Putative HIV exposure period defined as interval between the last negative and first positive HIV test
- Interviews
 - Travel history
 - HIV risk behavior history while traveling or living outside the United States
 - HIV risk behavior history with foreign-born partners
- Laboratory Testing
 - Recent HIV infection
 - Serological Testing Algorithm for Recent HIV Seroconversion (STARHS)
 - Estimated mean time from seroconversion = 170 days (95% CI, 145-200 days)
 - Vironostika HIV-1 LS-EIA
 - HIV-1 strain characterization
 - HIV-1 drug resistance
 - Population sequencing
 - TRUGENE HIV-1 Genotyping Kit

RESULTS

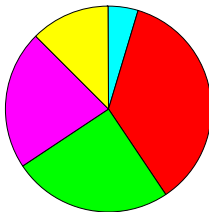
Demographic Characteristics

- Country of Birth
 - 49 participants (77%) were born in the United States
 - 15 participants (23%) were born outside of the United States

Race/Ethnicity



Age



HIV Strain Characterization

- All viral isolates were classified as HIV-1 subtype B

HIV Recent Infection

- Eighteen participants (28%) identified as recent infections

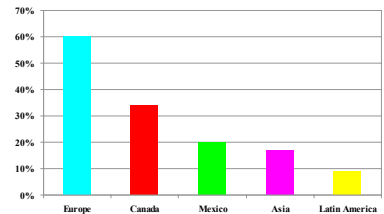
HIV Exposure Period

- Median = 2 years
- Range = 2 months to 8 years

RESULTS

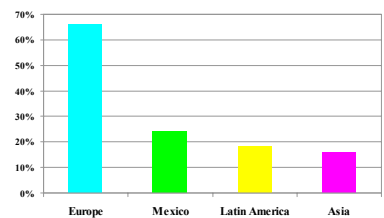
Travel History

- Thirty-five participants (55%) lived or traveled outside the United States during putative exposure period.



Sex with Foreign-born Partners

- Thirty-eight participants (59%) reported foreign-born partners.



Antiretroviral Resistance

- Eight participants (12.5%) had major drug-resistant mutations.
- Four of the resistance cases were recent infections.
- Seven of the resistance cases reported travel outside of the United States during the putative exposure period.
- Four of the resistance cases reported having foreign-born sex partners during the putative exposure period.

Cases	NRTI	NNRTI	PI
1		K103N	
2	M41L		V82A, L90M
3	K70R	D67N	
4	M184V	K103N	
5	M41L		
6			L90M
7	M41L		
8	V118I		

NRTI: nucleoside reverse transcriptase inhibitors
NNRTI: non-nucleoside reverse transcriptase inhibitors
PI: protease inhibitors

CONCLUSIONS

International travel and sex with foreign-born partners were very common among newly diagnosed HIV-infected persons during the period of likely exposure.

- Suggests high potential for cross-border HIV transmission.

The high prevalence of major resistance mutations among recently infected persons suggests transmission of drug-resistant strains.

HIV prevention strategies should incorporate specific counseling on risk of cross-border acquisition and transmission of drug-resistant HIV infection.

- Particularly in an era of expanding antiretroviral treatment worldwide.
- Countries with low antiretroviral treatment rates still may have primary drug-resistant cases through transmission by individuals from countries with broad access to treatment.