

Travel patterns and risk behaviour of HIV-positive people travelling internationally

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Abstract

Background: International travel is associated with an increased risk of enteric, vector-borne, sexually transmitted and blood-borne infections. These risks are even higher among immunocompromised people, such as those with HIV infection. We conducted a study to determine HIV-positive people's travel patterns and risk behaviours while abroad.

Methods: We conducted an anonymous survey of HIV-positive people attending an HIV clinic in a tertiary care hospital in Toronto about their travel activities and pretravel precautions as well as their burden of illness and risk exposure during travel. We compared the characteristics of respondents who had travelled outside Canada and the United States (international travellers) with those of respondents who had not travelled internationally.

Results: Of 290 HIV-positive people who participated in the study, 133 (45.9%) indicated that they had travelled internationally in the 5 years before the survey. These people were predominantly men (93.2%) and well educated (60.0% had a university level education), and they had travelled mostly for personal reasons (89.5%) on trips that lasted 3.6 weeks on average. Only 58 (43.6%) sought health advice before travelling, and only 17 (12.8%) sought advice from a travel clinic. Five (3.8%) had received live vaccines before travel, and 9 (6.8%) had taken malaria chemoprophylaxis. Of the 119 international travellers who were taking antiretroviral therapy; 35 (29.4%) reported either discontinuing their medications or being poorly compliant with the therapy while travelling. Thirty-one (23.3%) of the 133 international travellers reported having had casual sexual activity with new partners while travelling, and only 18 (58.1%) of them reported always using a condom. Twenty-one (15.8%) of the 133 reported having had risky exposure to sharps. Twenty-four (18.0%) said they had become ill enough while travelling to require medical attention.

Interpretation: Only one-fifth of HIV-positive people surveyed who travelled internationally sought advice from a health professional before their trip. Their travel was associated with poor adherence to antiretroviral therapy, risky sexual practices and risky exposure to sharps.

enteric and vector-borne pathogens, and travellers who engage in risky behaviours (e.g., unsafe sex and exposure to sharps) are at increased risk of blood- and body fluid-borne infections.¹⁻⁵ Lifestyle factors and underlying health status influence the predisposition to and the severity of infections in travellers. HIV-positive travellers may be particularly susceptible to acquiring infections.^{6,7} In addition, they have to take into consideration issues related to their complex medication regimens and access to appropriate medical care while abroad.^{8,9}

To date, there have been few comprehensive studies of HIV-positive people's travel practices, risk behaviours and complications incurred by travelling. The aim of our study was to profile HIV-positive people who travelled internationally with respect to their demographic characteristics, their preparations before travel, their travel practices, their risk behaviour and exposure to blood and body fluids during travel, and medical help required while abroad.

Methods

We conducted an anonymous questionnaire survey of consecutive attendees at an HIV clinic at the Toronto General Hospital in June and December 2001. The questionnaire was designed on the basis of a survey that had been previously validated and shown to be reproducible in travellers.^{10,11} Respondents were asked to provide general information regarding their HIV status, demographic characteristics and their recent travel profile (in the 5 years before the survey). The data on their CD4 count and viral load were obtained from their charts. Respondents who had travelled internationally (outside Canada and the United States) were asked about their preparations before travel, their exposure to blood and body fluids during travel, and medical help required while abroad. To reduce recall bias, they were asked detailed questions about their most recent international trip. We compared the characteristics of HIV-positive respondents who had travelled internationally with those of HIV-positive respondents who travelled only within Canada and the United States.

The University Health Network Research Ethics Board approved the study design. No compensation for completing the questionnaire was offered to respondents.

Data were analyzed with the use of standard parametric and nonparametric tests. We used the χ^2 test or the Mann-Whitney rank sum test (T statistic) to compare categorical variables. To compare continuous variables we used the Student's *t* test. In the case of non-normally distributed samples, the Kruskal-Wallis one-way analysis of variance of ranks (H statistic) was applied.

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The incidence of infectious diseases in returning international travellers continues to increase.¹ Overseas travel is especially associated with exposure to

Results

A total of 290 consecutive people with HIV-1 infection attending the hospital's HIV clinic agreed to complete the questionnaire. In the 5 years before the survey, participants indicated that they had travelled a median of 4 times outside Canada (interquartile range [IQR] 1–10); a median of 2 (IQR 0–5) of these trips were to the United States. Of the participants, 133 (45.9%) had travelled outside Canada and the United States (international travellers). These participants did not differ significantly from those who did not travel internationally with respect to age, country of birth, CD4 count and viral load (Table 1). However, there were fewer women in the group of international travellers than in the other group (6.8% v. 17.8%, $p = 0.008$). International travellers were also significantly more likely to have a university or professional degree, to have visited the United States in the 5 years before the survey and to be taking prophylactic therapy against *Pneumocystis* pneumonia, fungal infection or herpes infection (Table 1).

For their most recent international trip, the international travellers reported going mostly to Europe, Latin America and the Caribbean; the most common reasons were tourism and visits to family or friends overseas (Table 2). The majority of international travellers were single (55.1%) at the time of travel, and many (44.1%) travelled alone for all or a part of their trip, with 27.1% travelling

with their partner and the rest with friends or family.

Only 58 (43.6%) of the 133 international travellers sought health advice before travelling (Table 3). Of these 58, only 29 informed the provider of the health information that they were HIV-1 positive. Of the remaining 75 who did not seek health advice before travelling, 70 said that they thought it was unnecessary. However, 39 of these 70 were travelling to non-European locations that could have put them at increased risk of infection (e.g., Southeast Asia, Africa and South America). The cost of pretravel advice was rarely reported as a barrier to seeking information.

Preventive measures taken by the international travellers are reported in Table 3. On the basis of health risks to the travellers at their destination, it was estimated that at least 56 required malaria prevention measures, but only 21 used such measures (Table 3). Twenty-three international travellers were vaccinated (Table 3). Individuals who received live vaccines for yellow fever and typhoid had a moderately decreased CD4 count ($0.24\text{--}0.38 \times 10^9/\text{L}$ [$245\text{--}380$ cells/ mm^3]) and their physicians knew they were HIV positive.

Of the 133 international travellers, 119 (89.5%) were taking antiretroviral therapy (Table 4). Overall, 53 (44.5%) of the 119 adhered to the therapy while travelling, 31 (26.1%) missed only 1–3 doses (which represented less than 5% of their total doses), and 35 (29.4%) either stopped taking the medications or were poorly adherent to the therapy. Fourteen of the 35 reported having stopped the anti-

Table 1: Characteristics of people with HIV-1 infection who travelled internationally and those who did not travel internationally

Characteristic	No. (%)* of HIV-positive respondents		χ^2 value	<i>p</i> value
	International travellers <i>n</i> = 133	Other respondents <i>n</i> = 157		
Age, yr, mean (SD)	44.4 (8.9)	43.5 (9.2)	–	–
Sex				
Male	124 (93.2)	129 (82.2)	–	–
Female	9 (6.8)	28 (17.8)	7.98	0.008
Born in Canada	84 (63.2)	106 (67.5)	–	–
University level of education	79 (59.4)	67 (42.7)	8.0	0.005
CD4 count, $\times 10^9/\text{L}$ (cells/ mm^3)				
Median	0.32 (325)	0.40 (400)		
IQR	0.20–0.57 (200–570)	0.18–0.55 (184–550)	–	0.80
Viral load, HIV-1 RNA copies/mL, median (IQR)	59 (49–10 000)	49 (49–1300)	–	0.08
No. of trips within Canada and the United States, median (IQR)	3.0 (1–6.75)	2.0 (0–5)	–	0.004
Antiretroviral therapy				
NRTIs	119 (89.5)	128 (81.5)	–	–
Protease inhibitors	87 (65.4)	85 (54.1)	–	–
NNRTIs	49 (36.8)	52 (33.1)	–	–
Prophylactic therapy (e.g., against PCP, fungal infection, herpes)	56 (42.1)	46 (29.3)	5.15	0.028

Note: SD = standard deviation, IQR = interquartile range, NRTI = nucleoside reverse transcriptase inhibitor, NNRTI = non-nucleoside reverse transcriptase inhibitor, PCP = *Pneumocystis* pneumonia.

*Unless stated otherwise.

retroviral therapy just before their trip; only 7 of the 14 had discussed this discontinuation with their physician. Four of the 14 patients stopped the therapy because they “wanted a break” and 10 because they were afraid to cross borders with antiretroviral medications. Of the remaining 21 patients, 8 stopped their therapy during their trip, 7 ran out of medications while travelling, and 6 indicated that they frequently missed doses. Five of the 119 respondents taking antiretroviral therapy reported that they had been harassed crossing borders; 4 attributed this to their antiretroviral medication or their HIV status.

With respect to risk exposure, 21 of the international travellers reported having been exposed to sharp objects during travel, and 31 reported having engaged in casual sexual intercourse with a new partner (Table 4). The number of new sexual partners during travel ranged from 1 to 10 (mean 2.5, 95% confidence interval 1.7–3.3). Only 18 of the 31 travellers who engaged in casual sexual activity reported “always” using a condom; 4 reported “never” using one.

Significant medical illness related to travel occurred in 24 (18.0%) of the 133 international travellers (Table 4). Of 11 cases in which a medical diagnosis was available, 7 (63.6%) were infectious diseases.

Interpretation

The HIV-positive international travellers who participated in our study were predominantly homosexual men receiving highly active antiretroviral therapy (HAART)

Table 2: Characteristics of the most recent international trip taken by HIV-positive travellers

Characteristic	No. (%) of international travellers*
Reason for travel	
Tourism	73 (54.9)
Family visit	46 (34.6)
Business	8 (6.0)
Main destination	
Europe	60 (45.1)
Latin America or Caribbean	57 (42.9)
Asia	14 (10.5)
Place	
City	59 (44.4)
Town	36 (27.1)
Wilderness	19 (14.3)
Accommodation	
Private residence	48 (36.1)
Hotel	60 (45.1)
Hostel	5 (3.8)
Camping	0
Duration of travel, wk, median (range)	2 (0.3–30)

*Unless stated otherwise. Numbers do not sum to total because not every place was included here and some people travelled to more than one place.

who had well-preserved immune systems, characteristics that were typical of our HIV clinic population (unpublished data). Most of the travellers reported taking trips for pleasure, had extended trips that lasted almost a month on average and stayed in private residences or hotels within cities and towns. Over one-third said they travelled to visit friends and relatives. Travellers who stay at their family's or friends' homes may be more exposed to infectious agents than tourists in hotels. Friends and relatives have more close contact with local residents who may be carrying infectious agents; also, the water at their homes may not be purified enough or the control over the sanitary practices may be poorer than in hotels.¹

The international travellers among the HIV-positive participants in our study were mostly well-educated men who had also taken more trips to the United States and took medications to prevent opportunistic infections more frequently than the other respondents. The latter may likely be related to their higher educational and socioeconomic status.

Few of the international travellers sought authoritative health advice before going abroad. This was also noted in previous studies, in which travel medicine physicians were consulted by only 5%⁸ to 20%⁶ of HIV-positive international travellers. It is often recommended that HIV-

Table 3: Preparations made before travel by HIV-positive international travellers

Preparation	No. (%) of travellers
Seeking of health advice	<i>n</i> = 58
Source	
Physician at HIV clinic	27 (46.6)
Travel clinic	17 (29.3)
Internet	5 (8.6)
Travel agent	2 (3.4)
Type of information	
Travel-related diseases	23 (39.7)
Vaccinations	25 (43.1)
Malaria prevention	13 (22.4)
Border and visa requirements	14 (24.1)
Safer sex	3 (5.2)
Physician's letter about anti-HIV medications	16 (27.6)
HIV physician at destination	5 (8.6)
Preventive measures	<i>n</i> = 133
Antidiarrheal drugs (e.g., loperamide)	59 (44.4)
Insect repellents and mosquito nets	21 (15.8)
Malaria chemoprophylaxis	9 (6.8)
Pretravel vaccinations	23 (17.3)
Yellow fever	2 (1.5)
Typhoid	3 (2.3)
Diphtheria–tetanus	10 (7.5)
Hepatitis A	17 (12.8)
Hepatitis B	20 (15.0)

positive travellers take medication with them in case of enteric disease, but in our study less than half of the participants had done so. Many of our patients probably missed opportunities for receiving appropriate immunizations since few had received hepatitis A and hepatitis B vaccines. Also, only a few of those who travelled to tropical countries took malaria chemoprophylaxis and general precautions against vector-borne infections. Moreover, 5 travellers reported having received live virus vaccines, which could pose a risk to those among them with poorer immune systems.

It is estimated that between 20% and 70% of travellers report illnesses associated with their travel,^{2,3} and about 1%–5% become ill enough to seek medical attention.² In our study, the proportion of HIV-positive travellers who reported becoming ill enough to seek medical attention was higher than the proportion among HIV-negative Canadian travellers.¹⁰ In previous studies involving HIV-positive travellers, the proportion who sought medical attention for travel-related complaints was almost 2-fold higher than the proportion in our study;^{6,8} however, those studies took place before HAART was available and included travellers with poorer immune systems.

In our previous study on travel patterns and risk behaviours of organ transplant recipients,¹² two-thirds of the study participants reported seeking health-related advice before their travels, as compared with less than half of the

HIV-positive travellers in the current study, even when their trip was going to put them at greater risk of becoming ill. The reported frequency of travel-related illness among the organ transplant recipients was similar to the frequency among the HIV-positive participants in the current study.

The frequency of casual sex (often without condoms) while travelling, the number of new sexual partners and the exposure to sharps during travel were higher among the HIV-positive international travellers in our study than among HIV-negative travellers¹⁰ or organ transplant recipients.¹²

Many of the international travellers in our study discontinued their antiretroviral therapy just before or during travel or were poorly compliant with it while travelling. This situation might have been averted by proper counselling and consultation before travel. Kemper and associates,⁸ in the pre-HAART era, noted poor compliance by about 20% of their HIV-positive travellers. Since people with HIV infection are frequent travellers, these rates of poor adherence may make a significant contribution to antiretroviral drug failures.

There are several limitations to our study. A certain degree of recall bias in answering the travel questions was unavoidable, because the respondents had not just returned from their trip. Furthermore, we did not have complete details as to why medical attention had been sought during their travels. Therefore, we could not determine to what extent the need for professional medical help was related to their HIV status. Finally, we did not ask the HIV-positive people who travelled only within Canada and the United States about their sexual practices during travel, so we could not compare these 2 groups of HIV-positive travellers in this respect. The surprising finding, though, was that many of the international travellers reported not using condoms when engaging in casual sexual intercourse with a new partner. Not only did they put the sexual partners at high risk of HIV infection, they put themselves at risk of STDs, including HIV infection with the same or another virus type and possibly a drug-resistant strain.¹³

In conclusion, we report the travel practices and risk behaviours of HIV-positive international travellers in the HAART era. The few previous studies examined much smaller samples of very immunocompromised HIV-positive travellers^{6,8} and those who acquired exotic infections.¹⁴ From the current study, it is clear that HIV-positive patients are at increased risk of illness and poor compliance with antiretroviral regimens while travelling. Therefore, they would benefit from appropriate pretravel counselling, which should include information on safer sex, vector-borne diseases, immunization, border-crossing issues and adherence to drug therapy. Useful advice has been published for immunocompromised travellers,¹⁵ and information is available from the US Centers for Disease Control and Prevention (www.cdc.gov/travel/hivtrav.htm).

Table 4: Risk exposure and medical help sought during international travel

Variable	No. (%) of international travellers
Risk exposure	
Adherence to antiretroviral therapy during travel	<i>n</i> = 119
Complete	53 (44.5)
Partial (missed 1–3 doses)	31 (26.1)
Poor or none	35 (29.4)
Casual sexual intercourse	<i>n</i> = 31
With another traveller	11 (35.5)
With local resident	27 (87.1)
With commercial sex worker	1 (3.2)
Exposure to sharps	<i>n</i> = 21
Tattoo	1 (4.8)
Injection drug use (medical)	6 (28.6)
Injection drug use (illicit)	1 (4.8)
Body piercing	6 (28.6)
Shared razor	7 (33.3)
Medical help*	
Given diagnosis	11 (45.8)
Infectious diagnosis†	7 (29.2)
Seen by local physician	12 (50.0)
Seen at hospital or clinic	9 (37.5)
Seen immediately upon return	3 (12.5)

*The details of all illnesses are not available.

†Diagnoses included acute otitis media, bronchitis, influenza, pneumonia, upper respiratory tract infection, parasitic infection.

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- Guideline 8: Adjuvant systemic therapy for women with node-positive breast cancer [Mar. 6, 2001]
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