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Travel-associated sexually transmitted infections in Japan: An observational study using imported infectious disease registry data

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Abstract: International travel is a risk factor for acquiring sexually transmitted infections (STIs) owing to factors such as increased sexual opportunities, a sense of freedom, and the allure of the sex industry. We investigated the incidence of travel-associated STIs in Japan using data from the Japan Registry for Infectious Diseases from Abroad (J-RIDA) reported by 17 participating medical institutions between October 2017 and December 2022. Data were collected on the patients' age, sex, nationality, chief complaint, whether they had visited a travel clinic before travel, travel history, and final diagnosis. Of 4545 cases of travel-associated illness reported, 52 (1.1%) were STIs. Most patients with STIs were male (81%) with a median age of 31 years. HIV (17%), genital herpes (13%), syphilis (13%), and gonorrhea (12%) were the most frequently reported STIs. Only one patient had visited a travel clinic before travel. Promoting awareness and vaccination is crucial for preventing travel-associated STIs.

***Keywords*:** sexually transmitted infections, Travel medicine, HIV

Introduction

Sexually transmitted infections (STIs) are a pervasive global public health concern. International travel is associated with an increased risk of acquiring STIs due to the freedom, exoticism, absence of regular partners, and allure of the sex industry, which facilitates new sexual encounters (*1*). Previous studies have reported travel-associated STI incidence rates of 0.9–5.7% (*2*) in patients attending international travel clinics. However, establishing a direct causal link between travel and infection is challenging because STIs have variable incubation periods and are often asymptomatic.

Despite numerous reports on the incidence of travel-associated STIs, limited data are available on the incidence of travel-associated STIs in Japan. According to a previous single-center study by our team, 2.0% of symptomatic patients presenting with travel-associated illnesses were diagnosed with an STI (*3*). Notably, no patients presented with symptoms of urethritis, a recognized common precursor of travel-associated STIs, suggesting that patients with urethritis symptoms sought medical attention elsewhere such as at sexually transmitted disease clinics or urology departments. Thus, collaborative investigations involving multiple healthcare facilities are necessary to obtain precise data on the incidence of travel-associated infections. To address this need, the Japan Registry for Infectious Diseases from Abroad (J-RIDA) was established, with the primary goal of documenting the profile of imported infectious diseases in Japan (*4*). In this study, we reviewed cases of travel-associated STIs registered in J-RIDA to assess the scope of travel-associated STIs.

Study design and data collection

J-RIDA was established as a repository for imported infectious diseases. The study cohort comprised patients with suspected infections acquired overseas, and there were no specific constraints on travel duration. Japanese residents traveling abroad and foreign visitors arriving in Japan were eligible for inclusion in this study. Patients registered in J-RIDA who were diagnosed with travel-associated STIs were included in this study. We used

REDCap, an electronic data collection system, for case registration. This system facilitated the systematic compilation of data from a diverse array of sources.

Case registration commenced in October 2017, with 17 Japanese medical institutions contributing to the database. Information collected during enrollment included patient demographics (age, sex, and nationality), chief complaint, travel history, date of visit, date of onset, whether the patient had visited a travel clinic before traveling, final diagnosis, and patient outcomes. Thirteen diseases were classified as STIs: syphilis, HIV infection, genital *Chlamydia* infection, gonorrhea, genital herpes virus infection, condyloma acuminatum, trichomoniasis, genital candidiasis, hepatitis B, urethritis not otherwise specified, genital ulcer, acute pelvic inflammatory disease, and pubic lice. Other clinician-judged STIs were also included. Acquired immunodeficiency syndrome, herpes simplex infection, chronic pelvic inflammatory disease, and genital warts were excluded due to the extended interval between infection and diagnosis. Hepatitis A, amoebic dysentery, and giardiasis, which can be transmitted both sexually and orally, were also excluded. For HIV, syphilis, and hepatitis B, clinical judgment determined their association with travel.

The study was approved by the National Center for Global Health and Medicine ethics committee (NCGM-G-002328-08) and the ethics committees of each participating institution before case registration started. The study was conducted in compliance with the principles of the Declaration of Helsinki. The requirement for informed consent was waived because the study was a retrospective analysis of registry data.

The J-RIDA database is not publicly available, but participating research centers can use the data if the research group agrees. For this study, we obtained authorization from the J-RIDA steering committee to use the data for the purpose of analyzing travel-associated STIs in Japan.

Table 1. Characteristics of patients diagnosed with travel-associated STIs and other travel-associated conditions

Characteristics	Travel-associated STIs (n = 52)	Other travel-associated conditions (n = 4,493)
Age (years), median (range)	31 (26–39)	33 (24–46)
Male	42 (81%)	2,629 (59%)
Nationality (area)		
Japan	21 (40%)	3,256 (72%)
Europe	9 (17%)	217 (5%)
Southeast Asia	8 (15%)	231 (5%)
North America	7 (13%)	125 (3%)
East Asia	5 (10%)	348 (8%)
Africa	2 (4%)	92 (2%)
Other	0	224 (5%)
Country (area) of residence		
Japan	39 (75%)	3,591 (80%)
North America	5 (10%)	109 (2%)
Europe	3 (6%)	162 (4%)
East Asia	3 (6%)	210 (5%)
Southeast Asia	2 (4%)	203 (5%)
Other	0	218 (5%)
Area of visit		
Southeast Asia	29 (45%)	2,165 (37%)
Europe	14 (22%)	532 (9%)
East Asia	9 (14%)	891 (15%)
North America	8 (12%)	260 (4%)
South Asia	3 (5%)	515 (9%)
Africa	1 (2%)	806 (14%)
Other	1 (2%)	625 (14%)
Purpose of visit		
Tourist from abroad	18 (35%)	599 (13%)
Personal travel	12 (23%)	1,283 (28%)
Business	10 (19%)	1,161 (26%)
Immigration	7 (13%)	165 (4%)
Visiting friends and relatives	3 (6%)	314 (7%)
Other	2 (4%)	1,018 (23%)

Epidemiology of travel-associated STI in Japan

During the enrollment period, 4545 patients were enrolled, of whom 52 (1.1%) were diagnosed with an STI and 4,493 were diagnosed with other conditions. Table 1 summarizes the characteristics of the cases. Of the 52 patients diagnosed with an STI, 42 (81%) were male, with a median age of 31 years. The most frequent reasons for travel were tourist from abroad (35%), personal travel (23%), and business (19%). In the patient cohort, 21 patients (40%) were Japanese, and the remaining patients were from various regions: 9 (17%) from Europe, 8 (15%) from Southeast Asia, 7 (13%) from North America, 5 (10%) from East Asia, and 2 (4%) from Africa. Furthermore, 42 patients had travelled to 65 countries, distributed as follows: 45% in Southeast Asia, 14% in East Asia, 5% in South Asia, 22% in Europe, 12% in North America, and 2% in Africa. Among patients diagnosed with non-STIs, 72% were foreign nationals. Compared with patients diagnosed with non-STIs, patients diagnosed with STIs were more likely to be foreign nationals (31/52, 60% *vs.* 1237/4493, 28%). Among the 25 patients with STIs, excluding tourists from abroad, immigrants, and those visiting friends and relatives, only one patient (4%) had visited a travel clinic prior to their departure.

The distribution of STIs is detailed in Table 2. The most frequently diagnosed STIs were to HIV infection (9 cases, 17%), genital herpes (7 cases, 13%), syphilis (7 cases, 13%), and gonorrhea (6 cases, 12%). In addition, 2 cases (4%) of Mpox, an STI that has recently attracted worldwide attention, were reported. Among the 9 patients with HIV infection identified in our study, 4 were foreign nationals and 6 had traveled to other Asian countries. Seven patients had systemic symptoms suggestive of acute HIV infection, including fever and night sweats.

This study reviewed the records of patients diagnosed with travel-associated STIs at 17 medical institutions over a 5-year period. To our knowledge, this is the first multicenter study of travel-associated STIs in Japan. We

Table 2. Distribution of travel-associated sexually transmitted infections reported to the Japan Registry for Infectious Diseases from Abroad (J-RIDA) between October 2017 and December 2022

Infections	Travel-associated STIs (*n* = 52) *n* (%)
HIV Infection	9 (17%)
Genital herpes	7 (13%)
Syphilis	7 (13%)
Gonorrhea	6 (12%)
Acute pelvic inflammatory disease	5 (10%)
Urethritis not otherwise specified	5 (10%)
Hepatitis B	3 (6%)
Genital *Chlamydia* infection	3 (6%)
Mpox	2 (4%)
Condyloma acuminatum	2 (4%)
Genital candidiasis	1 (2%)
Epididymitis	1 (2%)
Bacterial vaginosis	1 (2%)

conducted a comprehensive literature search for other multicenter studies on travel-associated STIs in Japan using PubMed and Ichushi-Web (a Japanese medical literature database). The search strategy for PubMed included combinations of MeSH terms and keywords related to STIs, travel, Japan, and multicenter studies. For Ichushi-Web, we used a similar search strategy with relevant Japanese keywords. Neither the PubMed search nor the Ichushi-Web search yielded any articles that met our criteria for a multicenter study on travel-associated STIs in Japan. These findings support our claim that this study is the first multicenter study to assess the profile of travel-associated STIs in Japan.

Data on the incidence of travel-associated STIs in Japan are inadequate. However, Kuroda *et al.* (*5*) reported that 2% of cases of male urethritis attributed to contact with commercial sex workers (CSWs) were linked to overseas travel. The GeoSentinel Surveillance and Research Network found that urinary tract infections, STIs, and gynecological diseases combined, accounted for 2.9% of health problems among travelers returning from abroad between 2007 and 2011 (*6*). This study found that 1.1% of patients with suspected infection acquired during travel to other countries were diagnosed with STIs, which is consistent with the proportion reported in studies from other countries.

Only one patient had visited a travel clinic before travel. Thus most travelers missed the opportunity for preventive measures such as hepatitis B vaccination, which is recommended for people traveling to high-prevalence regions for an extended period. Travel clinics can also provide education on STI prevention during pre-travel visits.

One characteristic of this study is that patients diagnosed with travel-associated STIs were more likely to be foreigners (31/52, 60%) than those diagnosed with other travel-associated conditions (1,237/4,493, 28%). Many STIs were diagnosed among travelers to Japan or immigrants seeking medical care. A previous investigation revealed that foreign nationals constituted 23.6% of the imported infectious disease cases recorded in J-RIDA-registered institutions. The elevated proportion of foreign patients in our study may stem from the limited availability of clinics that cater to foreign patients with suspected STIs. As the number of foreign nationals visiting Japan is likely to continue to increase, addressing the scarcity of clinics accessible to foreign visitors and enhancing education regarding appropriate STI management at clinics providing services for international visitors are pressing concerns.

Despite the availability of effective antiretroviral therapy, HIV infection remains an important STI concern. Developing countries, particularly those in Sub-Saharan Africa and Southeast Asia, face high rates of HIV infection compared with developed countries, including Japan. In developing countries HIV transmission is predominantly through heterosexual intercourse, whereas in the United States and Europe, it is primarily associated with homosexual contact and injection drug use. Consequently, both male and female travelers engaging in sexual activities while abroad should be made aware of the risk of HIV infection. In Southeast Asia, including Thailand and in African countries, HIV prevalence among CSWs is high. HIV incidence rates among CSWs in Southeast Asia range from 0.23 to 27.8 per 100 person-years (*7*). The prevalence of HIV infection among international travelers with STIs ranges from 2.2% to 27.4% (*8,9*). In Japan, 82.8% of the new HIV infections reported in 2019 were sexually transmitted, with 17.1% of Japanese men and 23% of Japanese women infected through heterosexual sex while traveling abroad (*10*). In this study, HIV was the most frequently diagnosed travel-associated STI, highlighting the importance of HIV testing in individuals who engage in high-risk sex during foreign travel. However, tests were not conducted to ascertain whether the cases of HIV identified were of recent onset, and we cannot rule out the possibility of domestic exposure.

In our study, two patients were diagnosed with Mpox, an STI that has attracted global attention recently. Mpox is caused disease by the monkeypox virus, which belongs to the genus *Orthopoxvirus*. It was first identified in humans in 1970 in the Democratic Republic of Congo. Since May 2022, cases of Mpox, which is endemic to central and West Africa, have been reported worldwide (*11*). Most cases are in men, with particularly men who have sex with men. During 2023, the number of reported Mpox cases continued to rise, raising concerns about potential future increases. Although the vaccines are effective in preventing Mpox, it is essential to provide individuals at risk of Mpox infection with information on measures, such as adherence to hand hygiene and condom use.

This study has several limitations. First, we did not investigate whether patients with travel-associated

STIs engaged in sexual activity during travel and did not collect information on sexual behavior, condom use, or sexual partners. This information is crucial for establishing a link between STIs and travel. Second, as data are derived solely from J-RIDA cases, there are no denominator data for all travelers. Consequently, calculating STI incidence rates among travelers or providing risk estimates for specific destinations is not possible. The study passively enrolled travelers seeking care for symptomatic infections and cannot quantify the incidence of travel-associated STIs, as affected travelers may be unaware of infections or perceive them as minor, forgoing medical treatment. This phenomenon particularly applies to infections that are typically asymptomatic, such as *Chlamydia*. Third, participating medical institutions were predominantly university and large urban hospitals focused on acute care. Patients with mild symptoms, such as urethritis, may visit STI clinics or urology and gynecology departments. Fourth, the lack of consistent diagnostic algorithms or standardized procedures for diagnosing STIs is another limitation. The J-RIDA system relies on experienced clinicians making diagnoses and defining diseases as associated with travel, but they do not have standardized diagnostic algorithms. Consequently, the observed high incidence of HIV infection among unwell travelers should be interpreted with caution. Finally, our definition of STIs included conditions such as hepatitis B and syphilis, for which establishing a link to travel can be difficult. These limitations may have led to an overestimation of the overall incidence of STIs among travelers.

In conclusion, the incidence of travel-associated STIs in Japan is comparable to that reported in other countries, highlighting the global nature of this issue and the need for a consistent management approach. When treating patients with travel-associated illness, healthcare providers should be vigilant for the presence of STIs and adopt a discreet and considerate approach when inquiring about sexual behavior. Early detection, appropriate treatment, and prevention of further transmission are crucial. Collaborative studies involving diverse institutions are necessary to obtain precise data on the incidence of travel-associated STIs. Additionally, establishing a system that increases awareness and educates travelers about STI prevention and appropriate vaccination prior to travel is essential.

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