CHAPTER 41

Sexually Transmitted Infections and Foreign Travel

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Because sexually transmitted infections (STIs) are defined by their transmission from one person to another during sex, travel—with its attendant opportunities for new contacts—can facilitate the transmission of STIs in several ways. The number of international travelers has increased steadily in recent years, with a trend toward areas of the world endemic for STIs not frequently seen in the United States. This allows for the exposure of travelers to relatively uncommon STIs, such as lymphogranuloma venereum (LGV). In addition, the prevalence of common STIs, such as gonorrhea and chlamydia, is higher in some destinations than in many parts of the United States. This may increase the likelihood of travelers' exposure to these pathogens within any given sexual encounter. Further, persons who purchase sex as part of a "travel experience" are often choosing partners who themselves have a higher likelihood of exposure to STIs. Finally, certain STIs, such as syphilis, are sensitive indicators of social and economic disruption; travelers to parts of the world that are experiencing wars or socioeconomic upheaval are especially vulnerable to exposure to these infections. The dynamic of STI transmission across borders has a reciprocal side: immigrants and refugees to the United States from areas with high STI prevalence may import these infections, particularly if they are clinically inapparent, as with latent syphilis.

Travelers need to be aware of the risk of STIs during travel and to understand measures to protect themselves *and* their prospective sexual partners in foreign countries.

CASUAL SEXUAL ACTIVITY AND TRAVEL

Traditionally, travelers undertaking long and frequent journeys have been recognized to be at risk for STI acquisition during travel. These groups have included long-distance truckers, seafarers, and military troops. However, as more of the population travels for recreational and business purposes, the group at risk for STI acquisition has greatly increased in size and heterogeneity, and risk stratification by occupation or reason for travel becomes less precise. In considering the relationship between international travel and exposure to STIs, the major determinant of risk is the individual's personal behavior.

Estimates of the frequency of sex associated with travel indicate that the practice occurs rather commonly, though the magnitude of such estimates depends on population surveyed and the gender of respondents. A recent meta-analysis reported a pooled prevalence of travel-associated casual sex of 20.4%, with a concomitant three-fold increased risk of acquiring an STI. Factors associated with casual sex while abroad were young age, male sex, and travel without a spouse or partner.

Several studies have examined the likelihood of sexual contacts by people living or employed in foreign or developing countries for long periods, including expatriates, overseas workers, and military personnel. In most of these studies, factors that were highly associated with these sexual contacts included not being accompanied by a partner or spouse, prior experience with purchasing sex, and history of previous STIs.

Despite the efficacy of condoms in preventing STI transmission, several studies have documented low rates of condom use in travelers (likely less than 50% use condoms consistently with casual sex). A recent meta-analysis of studies evaluating the efficacy of pretravel counseling on incidence of STI found no difference in approaches that used standard counseling versus motivational interviewing. However, randomized trials have not been performed.

SEXUAL TOURISM

Many developing countries have actively fostered the development of tourism as an economic tonic. Particularly before the recognition of the human immunodeficiency virus (HIV) pandemic, sexual tourism was promoted by international tourist agencies, either openly or under the guise of health or "medical treatment" tours. Some of these efforts even underplayed the magnitude of the local emerging HIV epidemic. As fatalities due to acquired immunodeficiency syndrome (AIDS) accrued, the relationship between the commercial sex implied by sexual tourism and HIV acquisition became more difficult to ignore. However, many local tour agencies may still be reluctant to provide, or certainly to stress, relevant information (and attendant caution) regarding local prevalence of HIV and other STIs, for fear of discouraging potential clients.

While specific data on sexual tourism are scarce, many studies have shown that HIV-1 infection is common among commercial sex workers (CSWs): 50-85% of urban CSWs in parts of Africa and Southeast Asia are HIV infected. One tragic consequence of the increased awareness of this risk has been the promotion of child prostitution because of the belief that sex with relatively young persons is safer than with older CSWs. This assumption is false: one survey found that approximately 50% of Thai child sex workers were HIV infected. Young CSWs are quickly exposed to the same STIs and may even be more likely to become infected with STDs during sexual intercourse because of traumatic penetration.

THE INTERNATIONAL SPREAD OF HIV

The initial explosive spread of HIV-1 infection among residents of Africa and rapid spread of HIV-1 through Southeast Asia and South America over the past decades were initially attributed to the high rate of CSWs and genital ulcerative diseases (GUDs) in these areas. Other factors emerged as possible contributors, including chemokine receptors such as CCR-5, which confers relative protection to progression of HIV-1 disease and is less common in blacks relative to whites, and exceedingly high prevalence of genital infection with herpes simplex virus type-2. While HIV transmission in North America, Western Europe, Australia, and New Zealand has been predominantly among homosexual men and intravenous drug users (IDUs), heterosexual transmission accounts for up to 70% of HIV-1 infections in sub-Saharan Africa and parts of the Caribbean and Asia. In Latin America, the epidemic continues to evidence a shift from the homosexual and bisexual population to a pattern of heterosexual transmission. The heterosexual transmission of HIV-1 that is seen in developing countries has followed a consistent trend. Predominantly female CSWs become infected from infected male clients (who include IDUs and international travelers). Male partners of the infected CSWs become infected themselves, and can then infect their female spouses at home. These infected women, many of whom have only one partner—their husbands—then transmit HIV-1 to their children in subsequent pregnancies.

Industrialized countries are presently experiencing a rise in the proportion of HIV-1 transmission occurring within the heterosexual population, particularly in inner cities among IDUs, CSWs, and immigrants from high-risk areas. Men who have sex with men (MSM) continue to be at the highest risk, and many urban areas in the United States have experienced an alarming reversal of the trend toward protected sex among men who have sex with men (many of whom are HIV-1-infected already), which likely continues to sustain an endemic level of HIV-1 transmission within this group. Rates of early syphilis (primary,

secondary, and early latent) are presently higher than at any time in the last two decades in many large cities globally as well.

RISKS FOR ACQUISITION OF STIS AND HIV DURING TRAVEL

Travelers should be advised that unprotected casual sex with fellow travelers is most likely to expose them to infections prevalent in their home countries: predominantly genital herpes, human papillomavirus, chlamydia, gonorrhea, and, depending on the interaction, syphilis or HIV-1. Unprotected sex with host-country nationals in the developing world may also potentially expose them to chancroid, LGV, and granuloma inguinale—diseases uncommon in Western industrialized countries.

Genital herpes, syphilis, chancroid, LGV, and granuloma inguinale are all causes of GUD. All but genital herpes are bacterial GUD and thus are curable with appropriate antibiotic treatment, and antiviral therapy can lessen the clinical symptoms and viral shedding associated with genital herpes. However, the presence of unhealed genital ulcers during intercourse increases the risk of HIV acquisition and transmission, and possibly of other viral diseases as well. In addition to HIV-1, sexual transmission of HIV-2 and other viruses (hepatitis B, hepatitis C, and human T-cell lymphotropic virus type 1) is a greater risk in parts of the developing world. While GUD is a major risk for increased transmission of HIV-1, other factors may contribute, including non-ulcerative STIs (notably, trichomoniasis), cervical ectopy, and certain sexual practices (anal intercourse, sex during menses, use of vaginal drying agents). Among men, increased HIV acquisition is strongly associated with lack of circumcision as well as the presence of GUD.

Vaginal use of the spermicide nonoxynol-9 (N-9) prevents neither HIV nor non-HIV STI transmission, and in fact, frequent use of vaginal sponges containing high doses of N-9 increased the risk of vaginal ulceration among CSWs. For these reasons, N-9 use is not recommended.

PREVENTION OF STIS AND HIV

Barrier Protection

The use of condoms is strongly recommended with every act of sexual intercourse when the status of a partner with regard to HIV infection or other STI is unknown; unfortunately, under even the best of circumstances, the protection condoms provide against STI is incomplete. For one, the normal breakage rate during vaginal intercourse with properly applied high-quality latex condoms produced in the United States is about 2%; complete slippage occurs about 1% of the time. Similar rates probably apply for anal intercourse, although failure rates as high as 5% have been reported during anal intercourse between men. Condoms manufactured abroad may have a higher breakage rate. Improper storage conditions (heat, moisture) or oil-based lubricants (mineral oil, petroleum jelly, massage oils, body lotions, shortening, cooking oil) can weaken latex condoms and contribute to a higher breakage rate. Use beyond the expiration date also increases the likelihood of breakage.

Latex condoms offer the most reliable barrier against STI. For persons with latex allergy (estimated at 1-3% of the US population), polyurethane (plastic) condoms offer an alternative; these are thinner than latex but reportedly stronger and, unlike latex, are not compromised by use with oil-based lubricants. They are, however, more costly than latex condoms and may require more lubrication. Finally, natural membrane condoms (often incorrectly called "lambskin" condoms) are generally made from lamb cecum; the membranous latticework of fibers can have pores up to 1500 nm in diameter. While this will prevent the passage of sperm, the pores are >10 times the diameter of HIV and >25 times the diameter of the hepatitis B virus. Laboratory studies suggest that viral transmission can occur with natural membrane condoms; hence, while clinical data are not available, it is generally recommended that they be avoided. They are more costly than latex as well.

The relative protection that condoms afford against STI acquisition is significant but not complete; abstinence remains the only sure method for avoiding STIs. In several studies of

couples who were discordant for the presence of HIV-1 infection, use of condoms significantly reduced the risk of HIV-1 transmission to the uninfected partner (up to a 10-fold reduction).

Availability and use of the female condom has been increasing worldwide. Although its relatively high cost can present a considerable deterrent, it offers a significant advance in woman-controlled methods of barrier protection. The female condom is slightly less effective for preventing pregnancy compared with male condoms; clinical studies in small numbers of women indicate protection against trichomoniasis reinfection, implying but not yet proving similar protection against other STIs.

Travelers should also be advised that the use of alcohol or drugs can negatively affect the decision to use a condom.

HIV Pre-Exposure Prophylaxis

Daily oral pre-exposure prophylaxis with 300 mg of tenofovir disoproxil fumarate (TDF), alone or with 200 mg of emtricitabine (FTC) (TDF-FTC [Truvada], Gilead Sciences), reduces risk of HIV-1 acquisition by ≥50% among high adherers, with demonstrated efficacy in MSM, heterosexuals, and injection drug users. On this basis, the US Food and Drug Administration approved daily Truvada for prevention of HIV-1 acquisition in July 2012, and the Centers for Disease Control and Prevention has issued guidance for its use. A discussion of risk for HIV-1 acquisition as defined in this guidance should be a routine component of pre-travel assessment.

Vaccines

The US Advisory Committee on Immunization Practices (ACIP) first issued guidelines for administration of the quadrivalent human papillomavirus (HPV) vaccine to females aged 25 years and younger in 2007, and subsequently expanded that to males. Most recently, ACIP has recommended substitution of a nine-valent HPV vaccine as available, given its expanded spectrum of activity. Specific details are available at www.cdc.gov/std/hpv. The nine-valent vaccine confers protection against HPV types 6/11 (responsible for 90% of genital warts) and 16/18 (responsible for 70% of cervical cancers), as well as types 31, 33, 45, 52, and 58. In published clinical trials, the quadrivalent HPV vaccine has demonstrated efficacy for prevention of HPV-type related cervical, vaginal, anal, and vulvar cancer precursor and dysplastic lesions, and external genital warts.

Immunization against hepatitis B virus (HBV) has been routinely recommended for infants since 1991 and was subsequently recommended for adolescents. While this has been temporally associated with marked declines in HBV incidence in the United States, sexual transmission still accounts for the majority of new infections, which are especially common among unvaccinated MSM. Consequently, hepatitis B vaccination is recommended for all adults who are at risk for sexual infection, including sex partners of hepatitis B surface antigen (HBsAg)-positive persons, sexually active persons who are not in a long-term, mutually monogamous relationship, persons seeking evaluation or treatment for an STI, and MSM. Moreover, all HIV-infected persons should be immunized against hepatitis B, as the natural history of hepatitis B is accelerated in the setting of HIV, and co-infection imposes specific considerations in selection of antiretroviral agents. Hepatitis A virus (HAV) vaccine is licensed and is recommended for MSM and illicit drug users (both injecting and noninjecting). Specific details are available at http://www.cdc.gov/hepatitis. Finally, new vaccine approaches aimed at hepatitis C, including peptide, recombinant protein, DNA, and vector-based vaccines, have recently reached phase I/II human clinical trials, providing some promise for future control of this infection.

ADVICE TO TRAVELERS

As the studies alluded to above demonstrate, travelers, and especially long-term travelers, are likely to engage in casual sex, and the unfortunate reality is that condoms are used consistently by the minority during high-risk sex. Female travelers may be less likely than

males to negotiate successful use of male condoms; availability of the female condom may offer a welcome alternative.

In summary, advice to travelers should include the following: (1) discuss the possibility of casual sex while abroad, (2) encourage the inclusion of high-quality latex condoms in the traveler's medical kit, (3) consider risk for sexual acquisition of HIV-1 and consider whether HIV pre-exposure prophylaxis is indicated, and (4) assure appropriate immunization status for HPV, HBV, and HAV.

Finally, travelers should be strongly encouraged to overcome reluctance to talk about personal sexual matters and to be sure to contact their personal physician or travel medicine clinic on return from travel if any unprotected sexual exposures occurred.

FURTHER READING

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