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Sexually Transmitted Infections Among College Students

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ABSTRACT

***Objective**: To review the common types and prevalence of sexually transmitted infections (STIs) among college students.*

***Methods:** Conducted a literature search in Google and PubMed, and 33 reports were analyzed on this subject.*

***Results:** The highest prevalence of STIs are among college aged students with approximately two thirds of students reporting having sex in the last year; men and women having 14 and 12 sex partners, respectively, on average in college. STIs range from common curable ones like chlamydia to deadly incurable ones like human immunodeficiency virus.*

***Conclusion:** Strategies to prevent STIs to help protect not only one's health, but the health of others, are to limit the number of sex partners, wear a condom, get tested, and receive vaccinations that prevent STIs.*

Keywords

College Students, Sexual Health, Sexually Transmitted Infections.

Introduction

By the age of 25, 1 in 2 people will contract a sexually transmitted infection (STI) [1]. STIs are spread predominantly by sexual contact, including vaginal, anal, and oral sex. Preventing the spread of STIs can be challenging as many of these diseases present with no symptoms. According to the Centers for Disease Control and Prevention (CDC), 70% of people who contract an STI report being asymptomatic [2]. Studies have also established that women have a higher biological risk for contracting STIs than men [3]. Although treatment is available for all STIs, not all are curable. Curable STIs with drug treatment include syphilis, gonorrhea, chlamydia, and trichomoniasis. Incurable STIs by drug treatment include hepatitis B, herpes simplex virus, HIV (human immunodeficiency virus), and human papillomavirus (HPV).

Of all age groups, the highest prevalence of STIs is among college-aged students [4]. A reason for the higher prevalence of STIs on college campuses could be attributed to the "hookup culture," a popularized term to describe casual sexual relationships. The rise in dating apps, increased access to birth control, condoms, and emergency contraceptives make sex easier and with less risk in some respects. A National College Health Assessment survey in 2018 found 66% of students reported having sex in the last year. However, college students are having less sex today than they did decades ago. In 2000, the same health assessment survey found 72% of college students reported having sex in the last year [5].

Regardless of the "sex recession" in recent years, students are nevertheless practicing unprotected sex. According to a survey of thousands of college students across the country, only 62% reported that they always or usually wear a condom [6]. Additionally, a 2019 national survey found only 40% of college males and 55% of college females reported receiving and completing their HPV vaccinations [7]. Condoms and vaccinations help reduce the transmission of STIs, which is especially important given that one may not know the sexual history of one's partner. Every time one has sex with someone, it's likely you are not the only person

with whom they have had sex. On average, college men have had about 14 sexual partners, while women have almost 12 sexual partners [8]. Each of one's partners could have been exposed to a similar number of sex partners, thirteen others for example. Even though one may have had sex with 14 people, one may have been indirectly exposed to potentially hundreds or more sexual partners.

The most prevalent STI in the world and among college students is HPV. An estimated 75% of the reproductive-aged population has been exposed to HPV [9]. A prospective study examined female college students every six months for three years and found 14% of college females were infected with HPV each year. The three-year cumulative incidence rate was 43% [10]. For the majority of cases, HPV infections are commonly cleared by the immune system. It is estimated about 90% of HPV cases are resolved without treatment within two years [11]. If the virus however continues to persist, it can cause the development of genital warts or certain kinds of cancer. The virus stays in the body's cells and over time slowly converts normal, healthy cells into cancerous cells which may not be diagnosed until years, or even decades after the initial infection. Some cancers include oropharyngeal cancer, anal cancer, cervical cancer for females and penile cancer in males [12]. Currently, there is no effective drug treatment to cure HPV, but there are prevention options such as condoms and the HPV vaccine. The nine valent HPV vaccine protects against nine strains of HPV and targets the strains that cause cancer and genital warts. The vaccine is nearly 100% effective if all doses are received at the correct intervals and if the vaccine was administered prior to exposure [13].

Chlamydia, gonorrhea, and syphilis are other relatively common STIs among college students, and CDC reports the incidence has been increasing among college aged students [14]. Among those aged 20-24 years the rate of chlamydia increased 17.2% from 2472 cases/100,000 in 2014 to 2899/100,000 in 2018 [15]. A routine screening for chlamydia on 10 college campuses found the prevalence of chlamydia among college students was 9.7%. The study also found freshmen and sophomores were 66% more likely to be infected than juniors and seniors [16]. Additionally, many people with chlamydia do not experience any symptoms. Although, some symptoms can include genital pain, discharge from the vagina or penis, painful urination, and painful sensations during sexual intercourse for females [17]. The current treatment option for chlamydia is antibiotics, which cures 95% of chlamydia cases [18]. Two of the most commonly prescribed antibiotics include azithromycin and doxycycline, which can clear chlamydia in about a week [18].

Syphilis is transmitted from person to person by direct contact with a syphilitic sore, known as a chancre. Chancres can occur on or around the external genitals, in the vagina, around the anus, or in the rectum, or in or around the mouth [14]. Among those aged 20-24 years the rate of syphilis increased 54.6% from 18.1 cases/100,000 in 2014 to 27.8 cases/100,000 in 2018 [15]. Transmission of syphilis can occur during vaginal, anal, or oral sex. Syphilis is easy to cure with a single injection of penicillin if diagnosed and treated in its early stages.

Gonorrhea is transmitted through sexual contact with the penis, vagina, mouth, or anus of an infected partner. Among those aged 20-24 years the number of gonorrhea cases increased 27.5% from 59,329 in 2014 to 75,683 in 2018 [15]. Ejaculation does not have to occur for gonorrhea to be transmitted or acquired [14]. Gonorrhea can also be spread perinatally from mother to baby during childbirth. Gonorrhea can be cured with single dose of 250mg of intramuscular ceftriaxone and 1 gram of oral azithromycin.

While the overall incidence of HIV infection has decreased in recent years, rates of HIV infection among college students has not seen a similar decline. It is estimated that one in 500 college students are infected with HIV. The CDC reported 22% of HIV cases involved individuals ages 13-24. Eighty-one percent of these cases were represented by college-aged students (age 20–24) [19]. In 2018, male heterosexuals constituted 8% of HIV diagnoses and heterosexual women accounted for 16% of HIV infections. Gay and bisexual men represented 69% of HIV infections [20]. The remaining cases were mainly through shared needles with illicit drug use. According to a recent report by the CDC, among transmen and transwomen, the HIV prevalence estimates were 14.1% and 3.2%, respectively, and 44.2%, 25.8%, and 6.7% among Black, Hispanic, and White transgender women, respectively [21].

HIV attacks the CD4 T-cells of the body's immune system, which impairs the body's ability to fight off infection and disease. Most people who die from HIV/AIDS do not die from the virus itself, but rather from other infections that take advantage of the body's weakened immune system. Some people infected with HIV develop a flu-like illness within two to four weeks after entry of the virus. Some symptoms include fever, headache, muscle aches, sore throat, swollen lymph glands, and night sweats. In many cases, symptoms can be so mild that they often go unnoticed. This stage of infection can be potentially dangerous as the viral load is greatest at primary infection, which can allow the virus to easily spread to other people and spread throughout the body [22]. Once the immune system is significantly weakened, a person enters Stage 3 HIV, also known as Acquired Immune Deficiency Syndrome (AIDS), the final stage of HIV infection. Untreated HIV typically progresses to AIDS in about 8 to 10 years and increases the likelihood of developing opportunistic infections or cancers. Currently, there is no vaccine for HIV/AIDS and no cure for AIDS. Methods for prevention of HIV include condom use and pre-exposure prophylaxis (PrEP). PrEP is a daily antiretroviral pill for uninfected people at high risk of HIV infection and is nearly 100% effective in preventing HIV infection from an HIV infected sex partner [23]. At the same suppression of HIV viral load by antiretroviral therapy in an HIV infected person, not only impairs the progression of HIV disease, but also significantly decreases the risk of transmission to an uninfected sex partner [24].

Some STIs can be spread through other means such as skin to skin or oral contact. Herpes simplex type 1 (HSV-1) is an example of an STI that is mainly transmitted through oral contact, causing oral herpes. Herpes simplex type 2 (HSV-2) can be transmitted during

sex or through contact with the genital skin, causing genital herpes [25]. A study conducted at the University of Wisconsin showed HSV-1 increased from 31% in 1993 to 78% in 2001 in college students [26].

Herpes simplex 1 and 2 infections are chronic, life-long viral infections with no cure. However, there are medications that can reduce the severity and frequency of symptoms. Antiviral medications such as Acyclovir and Valacyclovir inhibit replication of HSV-1 and HSV-2 and decrease risk of transmission to a sex partner [27]. Most HSV-1 and HSV-2 infections often carry no symptoms. Symptoms of oral herpes or type 1 can include painful blisters or open sores. After initial infection, the blisters or ulcers can periodically recur. Symptoms of genital herpes or type 2 include genital or anal blisters or open sores, fever, body aches, and swollen lymph nodes. After an initial genital herpes infection with HSV-2, recurrent symptoms are common but often less severe than the first outbreak [25].

Epstein-Barr virus (EBV) is one of the most common human viruses in the world, with at least 90% of adults infected by the age of 35 [28]. The virus is primarily transmitted through saliva and is mostly spread through deep kissing. EBV is the cause of infectious mononucleosis (mono) and has been shown to disproportionately affect undergraduate students. A study of 200 freshmen students at the University of Iowa found 56.1% of these students were antibody positive for EBV with an incidence rate of 33 cases/100 person a year among EBV antibody negative students. Of these EBV antibody-positive cases, 60% reported engaging in deep kissing [29]. A similar study conducted at the University of Minnesota found 56% of first-year students were positive for the EBV antibody [30]. Symptoms of mono include extreme fatigue, fever, rash, sore throat, swollen lymph nodes and body aches. Mono is rarely fatal, and treatment of mono includes, rest, drinking plenty of fluids, and over-the-counter medication for pain relief [31].

Using condoms and reducing the number of sexual partners is the best way to prevent and decrease the likelihood of contracting STIs. Male condoms have been shown to be 98% effective at protecting against most STIs while female condoms are about 95% effective when used properly [32]. Getting tested annually for STIs can detect and stop the progression of STIs. The CDC recommends all adults and adolescents from ages 13 to 64 should be tested at least once for HIV. Sexually active gay and bisexual men should be tested at least once a year for syphilis, chlamydia, gonorrhea, and HIV. Sexually active women younger than 25 years should be tested for gonorrhea and chlamydia every year. Those who have multiple or anonymous partners should be tested more frequently [33]. In conclusion, some of the best strategies to prevent STIs to help protect not only one's health, but the health of others are to limit the number of sex partners, wear a condom, get tested, and receive vaccinations that prevent STIs.

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