

Sexually Transmitted Infections and Adolescence

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SUMMARY Sexually transmitted infections (STIs) remain a public health problem of major significance in most of the world. Adolescents make up about 20% of the world population, of whom 85% live in developing countries. They are at a greater risk of STIs because they frequently have unprotected intercourse, biologically may be more susceptible to infection, often are engaged in multiple monogamous relationships of limited duration, and face multiple obstacles in accessing confidential health care services. Young people who begin to have sexual intercourse in early or middle adolescence are more likely to develop an STI than those who postpone intercourse until later adolescence or adulthood. The most common STIs among adolescents are chlamydia, gonorrhea, human papillomavirus infection, and trichomoniasis. Unfortunately, lately the incidence of HIV/AIDS and syphilis among adolescents is growing. Comprehensive sex education programs in schools can increase STI knowledge and prevent risky sexual behaviors. Health care providers can promote STI prevention methods, including counseling about safe sex.

KEY WORDS: sexually transmitted infections, adolescence, sexual education

INTRODUCTION

With nearly 20 million cases occurring annually, sexually transmitted infections (STIs) continue to persist as a major public health issue all around the world (1). Half of these infections occur among adolescents and young adults aged 15 to 24 years (1). Adolescents, as defined by the World Health Organization, are persons between 10 and 19 years of age. They make up about 20% of the world population, of whom 85% live in developing countries (2). Adolescence development stages are divided into 3 phases: early, middle and late (3). Early adolescence (10-14 years of age) is a stage when adolescents think about opposite sex, have 'crushes' but no romantic relationships (3).

Middle adolescence (15-16 years of age) is characterized by adolescents that are involved in risk talking and experimentation, they start to abuse substances, and they become sexually active (3). In late adolescence (17-21 years of age), adolescents are 'sexually mature', have romantic relationships and mostly practice safe sex (3). Adolescents by nature are shy, do not want to discuss personal matters, feel embarrassed to seek help, feel concerns about their body, and are anxious because of potential serious consequences.

Sexually transmitted infections are more than just embarrassment; they are a serious health problem. Many adolescents have no overt symptoms,

so they can carry undiagnosed infection for a long time, which can lead to other health problems such as infertility, cancer, continuing spread of disease, and even death (in case of HIV/AIDS).

RISK FACTORS

Adolescents are at a greater risk of STIs because they frequently have unprotected intercourse, biologically may be more susceptible to infection, they are often engaged in multiple sequential monogamous partnership of limited duration, and they face multiple obstacles in accessing confidential health care services. Most adolescents have their first sexual intercourse at an early age (<16 years), multiple sex partners, inconsistent contraceptive use (unprotected sex), and start substance experimentation (alcohol, drugs). Most of them, especially girls, have older partners (3+ years older), non romantic partners, non monogamous relationships, and one night stand(s). According to the Center for Disease and Prevention (CDC) study from 2004, 28% of adolescents had one night stand, 27% had non romantic partners, 53% had inconsistent contraceptive use, and even 54% had more than two sexual partners (4). According to a study conducted in Croatia, male adolescents are more likely than girls to have a one night stand, while girls are more likely to have only one partner and less likely to use alcohol and drugs during the first sexual intercourse (5).

THE MOST COMMON SEXUALLY TRANSMITTED INFECTIONS AMONG ADOLESCENTS

Chlamydia infection is the most common bacterial STI. It is more likely to be diagnosed in women, and it is frequently asymptomatic. As compared with other subpopulations, sexually active adolescent females aged 15-19 have the highest prevalence rates. Untreated chlamydia infection can potentially lead to more severe health problems, most notably pelvic inflammatory disease (PID), which can increase the risk of infertility, ectopic pregnancy and chronic pelvic pain, while facilitating human papillomavirus (HIV) transmission (6,7). The prevalence rate of chlamydia infection ranged from 1.5% to 39.1% in different studies (6-12). Women aged 16-19 were by 43.0% more likely to test positive for chlamydia than those aged 20-24 (8). Chlamydia is a reportable STI. Local health department should be notified once the diagnosis has been made. To determine chlamydia prevalence and sequels, routine annual screening

is recommended for sexually active women aged ≤ 25 (11,12).

Gonorrhea is a common bacterial STI. Data on gonorrhea incidence among adolescents are still very limited. The existing studies show the prevalence of gonorrhea among adolescent girls to be usually lower than that of chlamydia (13-16). Chlamydia has been found to occur as co-infection in patients treated for gonorrhea in up to 30% of cases, although some studies suggest that co-infection is less common in adolescents than in adults (14). Most cases of gonorrhea infection among adolescent females are either asymptomatic or only cause mild symptoms. This failure to recognize it can lead to serious long-term sequels including PID, ectopic pregnancy and infertility. The acute and chronic consequences of gonorrhea in boys, including urethral stricture and prostatitis, are less severe than those in girls.

Human papillomavirus, the most common viral STI in adolescents, can cause cancer of the cervix, vulva, anus and penis, as well as genital warts. It often inflicts adolescents and young adults shortly after the onset of sexual activity. So, in the first 10 years of sexual activity, point prevalence rates approach 25% and the lifetime risk of acquisition of this infection may be as high as 80% (17). The long-term consequences of sexual transmission of the disease are more serious in female than in male. The majority have only mild symptoms or are asymptomatic, so they frequently receive no treatment, and therefore have pregnancy, sterility and infertility, transplacental infection of the fetus, preterm and newborn infection along the contaminated genital tract. In addition, genital HPV is associated with cervical dysplasia and it can be important in the development of cervical cancer (18). There are two prophylactic HPV vaccines, the quadrivalent and bivalent vaccines. Vaccine is approved for use in women aged 9-26 years (19,20). The primary target population for vaccination should be 11- and 12-year-old females, although girls as young as 9 and those aged 13-26, who have been sexually active, may be vaccinated as well (19,20). Both vaccines have been shown to prevent more than 90% of pre-cancerous lesions associated with types 16 or 18 in HPV-naïve women (20-22). The vaccines are given in three doses over a six-month period. Vaccinating both men and women against a specific HPV type would result in a 44% decrease in the prevalence of that type, whereas vaccinating only women would result in 30% reduction (22). However, this vaccine will not replace other prevention

strategies since it will not work for all genital HPV types. A stable sexual relationship and consistent use of condoms in polygamous sexual practices is probably the most reliable means of controlling sexual transmission of HPV (18).

Trichomonas (T.) vaginalis is the most common curable STI worldwide, and adolescents account for a high number of cases. The prevalence in adolescents is reported to be 2.3% and 3.1% in women aged 14-49 years (23,24). Exact numbers are difficult to obtain, as the infection is not nationally reportable, and many infections are asymptomatic. Its prevalence is also typically underestimated due to the poor sensitivity of diagnostic tests. In females, vaginitis is the most common manifestation of the infection. Other complications include infection of the adnexa, endometrium, Skene's and Bartholin's glands. Males are usually asymptomatic. When symptoms are present, they usually manifest as urethritis. Infection with *T. vaginalis* is a marker of high-risk sexual behavior (25). Co-infection with other STIs is common. In one study of adolescents that had a diagnosis of at least one STD, there was almost a 9-fold increase in the likelihood of *T. vaginalis* infection in the ensuing 3 months (25,26). The importance of diagnosing trichomoniasis is highlighted by its strong association with HIV acquisition, may increase the rate of HPV infection or reactivation, although it may shorten the duration of infection (25-28). The low sensitivity of wet preparation and the often asymptomatic nature of trichomoniasis result in a failure to recognize and treat this STI.

Syphilis seems to increase with age; therefore, it is less a disease of adolescence. Men are affected more frequently with primary or secondary syphilis than women. The male-to-female ratio is 5.9. In 2007, 65% of new cases occurred in men who had sex with men, and there was a high rate of HIV co-infection (29). Due to the spontaneous healing of the initial lesion, it is often overlooked by adolescent patients. If undetected and untreated, the condition may bring disastrous consequences.

Genital herpes is the most common cause of genital ulcer disease. It is a chronic and life-long infection. Herpes simplex virus type 2 (HSV-2) infection increases the risk of HIV acquisition, trichomonas and gonorrhea (11). A recent analysis of HSV-2 infections in the United States revealed a five-fold increase in HSV-2 seroprevalence in females aged 14-19 and those aged 20-29 (30). Adolescence soon faced a marked increase in the risk of HSV-2 infection as young adults (11). Most

primary genital HSV infections are asymptomatic, with 70%-80% of seropositive individuals having no history of known genital herpes (31,32). Truly asymptomatic viral shedding may occur in 1%-2% of infected immunocompetent persons and may be as high as 6% in the first few months of the acquisition of the infection (31,32).

The adolescent years can be a very risky period for contracting **human immunodeficiency virus (HIV)** infection, but it may often go unrecognized until years later due to the long and often asymptomatic nature of the initial stage of HIV infection. Consequently, data on the number of cases of HIV/AIDS among adolescents may considerably underestimate the true number of infections in this population.

ORAL AND ANAL SEX

Many adolescents think that they need to have sexual intercourse to become infected. They should be taught that STIs can get through skin-to-skin contact with an infected area (herpes, HPV infection). Having oral or anal sex is also a way of transmitting STIs because viruses and bacteria that cause STIs can enter the body through tiny cuts in the mouth and anus, as well as genitals. Many young adults consider oral sex to be less risky in terms of health, social, and emotional consequences than vaginal sex (33). Over half of males and females aged 15-19 report having oral sex with someone of the opposite sex (34). About 24% of males and 22% of females aged 15-19 had oral sex but not vaginal intercourse (34). Anal sex is on the rise among teens and young adults, particularly those who have unprotected vaginal sex. Girls and young women are often persuaded to try such sexual behavior for wrong reasons, e.g., to please a partner, to have sex without the risk of pregnancy, to preserve their virginity, etc. But many do not understand the health consequences.

TEEN PREGNANCY

A sexually active teenager not using contraception has 90% chance of becoming pregnant within one year. The teenage pregnancy rate dropped by 40% from 1990 to 2005, reaching an historic low rate of 70.6 *per* 1000 women aged 15-19 (35). The rates fell much more for younger than for older teenagers. However, teen birth rates rose unexpectedly in 2006 and 2007 (36). Becoming a mother as a teenager is associated with a higher risk for a number of poor outcomes. Teen mothers are less likely to finish high school, less successful

at the job market, less likely to marry, and more likely to rely on public assistance than women who have children after their teen years. In addition, children of teen mothers generally do not fare as well as other children. They tend to score less optimally on assessments of cognitive development and academic achievement, and also tend to exhibit more problem behaviors than other children.

PREVENTING AND TREATING STIS IN ADOLESCENTS

It is much easier to prevent STIs than to treat them. The only way to prevent STIs completely is to abstain from all types of sexual contact. If someone is going to have sex, the best way to reduce the chance of getting an STI is by using condom. Adolescents who are having sex should get regular gynecologic or male genital examination. There are two reasons for this. First, these examinations give doctors a chance to teach them about STIs and protecting themselves. Second, regular examinations give doctors more opportunities to check for STIs while they are still in their earliest, most treatable stage (37).

Healthy development of adolescents is related to family support, positive peer influences, effective education, safe schools and communities. Sex education aims to reduce the risks of potentially negative outcomes from sexual behavior, such as unwanted or unplanned pregnancies and infection with STIs including HIV. It also aims to contribute to the adolescent positive experience of their sexuality by enhancing the quality of their relationships and their ability to make informed decisions over their lifetime.

Media through music, movies, television, magazines, and the Internet are all gateways through which teens access information about the world in general and about sex in particular. Media can have both positive and negative influence. Negative are portrayal of sexual relationships without consequences and unrealistic examples of sexual relationships. Positive educational messages are increasing awareness around issues such as STIs.

CONCLUSION

STI burden is substantial among adolescents, and the most common STIs begin to be acquired soon after sexual initiation. Adolescents are at a greater risk than older adults of acquiring STIs because of behavioral factors such as having multiple sex partners, engagement in unprotected intercourse, and choosing high-risk partners. It

is important to teach them how they can protect themselves and ensure that all adolescents have access to sex education and sexual health care well before their initial sexual activity.

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Successful Acta Dermatovenereologica Croatica (ADC) Editorial Board Meeting, Cavtat, May 15, 2010 from left: M. Waugh, M. Ramos-e-Silva, N. Tsankov, A. Basta-Juzbašić, G. Jemec, J. Lipozenčić. There was concluded that more Letters and Case Reports are needed in ADC.