Sexually Transmitted Diseases Other than Human Immunodeficiency Virus Infection in Older Adults

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Sexually active older adults may engage in activities that put them at risk for sexually transmitted diseases (STDs). A brief review of the main STDs among older adults, including the epidemiology, clinical presentations, and diagnosis and treatment recommendations for such STDs, is presented.

Sexually transmitted diseases (STDs) constitute the most common reportable communicable diseases in the United States, with >700,000 cases of Chlamydia trachomatis (CT) infection and >350,000 cases of Neisseria gonorrhoeae infection reported in 2000 [1]. The majority of these cases, however, occur among adolescents and young adults, and older adults often are not considered to be at risk for STDs. Studies show that many older adults are sexually active, and many health care practitioners may not realize that older adults may engage in higher-risk sexual activities. A survey of 1300 men and women ≥60 years of age, performed by the National Council on the Aging (Washington, DC) in 1998, found that 48% of the respondents were sexually active [2]. Rates of sexual activity were higher among individuals in their 60’s (of whom 71% of men and 51% of women were sexually active), and they decreased among individuals in their 70’s (of whom 57% of men and 30% of women were sexually active) and those in their 80’s (of whom 25% of men and 20% of women were sexually active).

Some older adults may have the desire to engage in sexual activity, but they experience barriers, such as psychosocial factors (e.g., depression, performance anxiety, or loss of a partner because of divorce, death, or disability) or medical conditions leading to erectile dysfunction or dyspareunia. The advent of oral medications for the treatment of erectile dysfunction, such as sildenafil citrate (Viagra; Pfizer [3]), is helping some individuals overcome that barrier, with Viagra having been prescribed for >10 million patients since its approval by the US Food and Drug Administration (Rockville, MD).

Although a number of studies have investigated the sexual behavior of older adults, patterns of condom use are not well defined in this group; however, because the risk for STDs is often linked to younger age or risk of pregnancy, older men and women may be less likely to use condoms. In a survey of >2000 Americans ≥50 years of age who were living in large metropolitan areas, Stall and Catania [4] found that among individuals reporting ≥1 risk factor for HIV infection (e.g., multiple sexual partners, a sexual partner with a high risk for HIV infection, receipt of a transfusion during 1978–1984, or injection drug use), 73% were sexually active, and 83% of those who were sexually active never used condoms. In a survey of patients at a community-based family practice clinic, Murphree and DeHaven [5] found that among unmarried women, condom use was significantly related to age <31 years, and that patients >45 years of age seldom received counseling about condoms. Although the rates of incidence of the reported STDs (chlamydia infection, gonorrhea, and syphilis) among older adults are low and have remained relatively stable during the past 5 years, the fact that many older adults are sexually active and may not use condoms when indicated can put them at risk for STDs. The present article reviews the epidemiology of STDs in older adults and the common clinical presentations of STDs. Treatment for the diseases, as recommended by the
<table>
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<tr>
<th>Sexually transmitted disease</th>
<th>Recommended regimen(s)</th>
<th>Alternative regimen(s)</th>
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<tr>
<td>Uncomplicated Chlamydia infection</td>
<td>Azithromycin, 1 g po, or Dox, 100 mg po b.i.d for 7 days</td>
<td>Erythromycin base, 500 mg po q.i.d. for 7 days; or erythromycin ethylsuccinate, 800 mg po q.i.d. for 7 days; or Of, 300 mg po b.i.d. for 7 days; or Lvfx, 500 mg po q.d. for 7 days</td>
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<tr>
<td>Uncomplicated gonorrhea&lt;sup&gt;a&lt;/sup&gt; infection</td>
<td>Cefixime,&lt;sup&gt;c&lt;/sup&gt; 400 mg po; or Ctri, 125 mg im; or ciprofloxacin,&lt;sup&gt;d&lt;/sup&gt; 500 mg po; or Of,&lt;sup&gt;c&lt;/sup&gt; 400 mg po; or Lvfx,&lt;sup&gt;c&lt;/sup&gt; 250 mg po</td>
<td>Spectinomycin,&lt;sup&gt;c&lt;/sup&gt; 2 g im</td>
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<td>Herpes simplex virus</td>
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<td>First clinical episode of herpes</td>
<td>Acy, either 400 mg po t.i.d. for 7–10 days or 200 mg po 5 times per day for 7–10 days; or Fam, 250 mg po t.i.d. for 7–10 days; or Val, 1 g po b.i.d. for 7–10 days</td>
<td>None</td>
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<td>Episodic therapy for recurrent episodes</td>
<td>Acy, either 400 mg po t.i.d. for 5 days, 200 mg po 5 times per day for 5 days, or 800 mg po b.i.d. for 5 days; or Fam, 125 mg po b.i.d. for 5 days; or Val, either 500 mg po b.i.d. for 3–5 days or 1 g po q.d. for 5 days</td>
<td>None</td>
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<td>Suppressive therapy</td>
<td>Acy, 400 mg po b.i.d.; or Fam, 250 mg po b.i.d.; or Val, either 500 mg po q.d. or 1 g po q.d.</td>
<td>None</td>
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<td>Syphilis</td>
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<td>Primary, secondary, and early latent</td>
<td>Benzathine penicillin G, 2.4 million U im × 1 dose</td>
<td>Dox,&lt;sup&gt;e&lt;/sup&gt; 100 mg po b.i.d. for 2 weeks; or Tet,&lt;sup&gt;e&lt;/sup&gt; 500 mg po q.i.d. for 2 weeks; or Ctri,&lt;sup&gt;e&lt;/sup&gt; 1 g im/iv q.d. for 8–10 days; or azithromycin,&lt;sup&gt;e&lt;/sup&gt; 2 g po</td>
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<td>Late latent and unknown duration</td>
<td>Benzathine penicillin G, 7.2 million U, administered as 3 doses of 2.4 million U im, at 1-week intervals</td>
<td>Dox,&lt;sup&gt;e&lt;/sup&gt; 100 mg p.o. b.i.d. for 4 weeks; or Tet,&lt;sup&gt;e&lt;/sup&gt; 500 mg p.o. q.i.d. for 4 weeks</td>
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<td>Neurosyphilis&lt;sup&gt;f&lt;/sup&gt;</td>
<td>Aqueous crystalline penicillin G, 18–24 million U/day, administered as 3–4 million U iv q4h for 10–14 days</td>
<td>Procaine penicillin G, 2.4 million U im q.d. for 10–14 days, plus probenecid, 500 mg po q.i.d. for 10–14 days</td>
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<tr>
<td>Trichomoniasis&lt;sup&gt;g&lt;/sup&gt;</td>
<td>Mtz, 2 g po</td>
<td>Mtz, 500 mg po b.i.d. for 7 days</td>
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**NOTE.**  
Acy, acyclovir; Ctri, ceftriaxone; Dox, doxycycline; Fam, famciclovir; Lvfx, levofloxacin; Mtz, metronidazole; Of, ofloxacin; Tet, tetracycline; Val, valacyclovir.

<sup>a</sup> Cotreatment for Chlamydia infection is indicated unless Chlamydia infection is ruled out by use of sensitive technology.

<sup>b</sup> If gonorrhea is documented and if it persists or recurs, test-of-cure culture is recommended to ensure that the patient does not have an untreated drug-resistant gonorrhea infection.

<sup>c</sup> Not recommended for pharyngeal gonococcal infection.

<sup>d</sup> Because of fluoroquinolone-resistant strains in Hawaii and the Pacific Rim, fluoroquinolones should not be the first-line treatment if the patient was exposed in these areas; use of fluoroquinolones for infections acquired in California is also inadvisable.

<sup>e</sup> Consider for treatment of patients with allergy to penicillin; however, because the efficacy of regimens that do not contain penicillin has not been established, and because compliance with some of these regimens may be difficult, close follow-up is essential. If compliance or follow-up cannot be ensured, then the patient should be desensitized and treated with benzathine penicillin G.

<sup>f</sup> Some specialists recommend use of benzathine penicillin G, 2.4 million U im weekly for 1–3 weeks after completion of initial treatment.

<sup>g</sup> Documented infection for which treatment failed should be evaluated for metronidazole-resistant Trichomonas vaginalis. Contact the Centers for Disease Control and Prevention (Atlanta, GA) at 404-639-8371 for more information.

Centers for Disease Control and Prevention (Atlanta, GA) is summarized in table 1 [6].

**CT INFECTION**

CT infection is predominantly a disease of adolescent girls and young women; its incidence appears to be highest among female adolescents and young women 15–19 years of age (2447 cases per 100,000 such individuals) [1]. The incidence of CT infection in women decreases substantially after 30 years of age, likely because the target cell for CT (i.e., the columnar epithelial cell, which is present on the ectocervix of young women [cervical ectopy]) is replaced by squamous epithelium through the process of squamous metaplasia that occurs with age. Among older adults (those ≥55 years of age), the reported incidence of CT infection is <5 cases per 100,000 adults, but rates vary among the different ethnic and racial groups.

CT can cause a variety of infections, including cervicitis, urethritis, proctitis, follicular conjunctivitis, epididymitis, and pelvic inflammatory disease (PID). In younger populations,
N. GONORRHOEAE INFECTION

Like chlamydia infection, disease due to the gonococcus (GC) is predominantly seen among adolescents, with the highest incidence rates seen among 15–19-year-old female adolescents and young women (716 cases per 100,000 such individuals) [1]. Incidence rates decrease with age, with <10 infections occurring per 100,000 individuals ≥55 years of age; as with CT infection, rates of incidence of GC infection vary depending on the sex and the ethnic and racial groups of individuals.

The clinical presentations of GC are similar to those of CT, with cervicitis, urethritis, proctitis, PID, and epididymitis being the most commonly encountered syndromes; however, GC can also colonize mucosal surfaces asymptptomatically. Unlike CT, GC can disseminate hematogenously from any mucosal site, causing disseminated gonococcal infection (DGI). DGI usually presents with arthralgias, tenosynovitis, or arthritis and rash. The rash, which is present in 2 of 3 patients, consists of a few (<30) pustular or necrotic lesions on the distal extremities. Highly sensitive tests for the diagnosis of GC infection include culture, Gram staining of urethral discharge, DNA hybridization probe, or any of the same NAATs that are available for diagnosis of CT infection. Because of its high specificity, culture may be advantageous for older populations in which the prevalence of GC infection is low, and it also offers the opportunity for sensitivity testing if needed. Routine screening is not recommended for older adults. Although currently recommended therapies for GC infection include the use of fluoroquinolones (FQs), resistance to FQs has been a problem in Hawaii, the Pacific Rim, and parts of Asia for several years, so cephalosporins are the only recommended therapy for infections acquired in these areas [6]. Moderate levels of resistance to FQs recently have been detected in California, so use of FQs in California is not recommended [9].

SYphilIS

The rate of incidence of early (recently acquired) syphilis is low among older adults in the United States. Average incidence rates of syphilis among adults ≥55 years of age were stable during 1998–2000, with ≤1 case occurring among 100,000 individuals [1]. Late latent syphilis and, on occasion, neurosyphilis and tertiary forms of syphilis probably are more commonly encountered in this age group. An overview of the different stages of syphilis has been published elsewhere [10]. Tertiary syphilis, although uncommon, can present with cardiovascular findings (aortitis and aortic aneurysm) or gummas, and it usually occurs 5–25 years after infection [11]. Neurosyphilis can occur at any stage of syphilis and can cause a variety of neurological syndromes. Syphilitic meningitis usually occurs early, within months of infection. Strokes due to meningovascular syphilis usually occur 5–12 years after infection, but they may occur earlier. Later neurological manifestations, which occur decades after infection and which usually present in older adults, may include dementia (general paresis), tabes dorsalis, VIIIth nerve deafness, or optic atrophy.

Many older adults may be tested for syphilis as part of a workup for strokes, dementia, or other neurological disorders, but the sensitivity of the nontreponemal tests (the Venereal Disease Research Laboratory [VDRL] test and the rapid plasma reagin [RPR] test) for later stages of syphilis may be low; up to 25% of patients with late neurosyphilis have a negative serum VDRL test result [10]. One study estimated that the rate of false-negative results of the serum VDRL test in older populations may be substantial [12], so consideration could be given to using a treponemal test (e.g., the fluorescent treponemal antibody–absorbed test [FTA-ABS] or the particle agglutination test for antibodies to Treponema pallidum [Serodia TP-PA; Fujiirebio]) if a clinical syndrome suggestive of active late syphilis is present and if the initial result of the nontreponemal test is negative. However, routine use of treponemal tests for older adults with strokes or dementia is not routinely recommended because the yield of such tests is low.

CSF analysis, including WBC count, protein level determination, and a CSF VDRL test, is more definitive in the diagnosis of neurosyphilis.
of neurosyphilis. Findings of pleocytosis (WBC count, ≥5 cells/μL) or an elevated protein level are suggestive of neurosyphilis, and a positive result of a CSF VDRL test is diagnostic (unless the CSF is grossly bloody). The CSF VDRL test, however, is relatively insensitive, and the finding of an isolated elevated protein level in an older individual may be difficult to interpret, because the CSF protein level normally increases with age. Because of problems with the FTA-ABS test’s specificity, it is not recommended that the test be performed on CSF samples; however, because the test has a high sensitivity, a negative CSF FTA-ABS test result might be helpful in ruling out neurosyphilis in unclear cases [10], such as those for which the CSF VDRL test result is negative but for which suspicion of neurosyphilis remains because of clinical findings or other CSF abnormalities. Penicillin remains the drug of choice for the treatment of syphilis, and, although a number of alternative therapies are possible (see table 1), data regarding regimens that do not contain penicillin are limited, and close follow-up is indicated if a regimen that does not contain penicillin is used.

HERPES SIMPLEX VIRUS (HSV)

Genital HSV infection is not a reportable disease in the United States, but data from the National Health and Nutrition Examination Survey (NHANES), which used type-specific serologic testing for detection of HSV type 1 (HSV-1) and HSV type 2 (HSV-2), estimated that ∼20% of the adult population in the United States is infected with HSV-2. HSV-2 infection usually is sexually acquired, with seroprevalence starting to increase at the onset of sexual activity and then increasing with age. According to the findings of NHANES III, the strongest predictors of positive HSV-2 serologic status were female sex, black race or Mexican-American ethnic background, older age, fewer years of formal education, income below the poverty level, greater number of sexual partners during a lifetime, and fewer years of formal education, income below the poverty level, older age, predictors of positive HSV-2 serologic status were female sex, age. According to the findings of NHANES III, the strongest

HUMAN PAPILLOMAVIRUS (HPV)

HPV infection is considered to be the most common STD, with 10%–20% of younger (age, 15–49 years) sexually active individuals showing molecular evidence of infection, and with up to 60% showing evidence of prior infection [14]. HPV infection is not a reportable disease, but studies suggest that the prevalence of infection is highest among young sexually active women and that it decreases with age. Most infections are subclinical and self-limited, with a minority of patients developing anogenital warts and with ∼10% developing chronic infection, which can predispose the patient to anogenital cancer. The incidence or prevalence of genital warts in older adults is not known, but clinical experience suggests that most cases occur in younger adults. Genital warts may be treated a variety of ways, depending on the location and extent of the disease; the choices of treatment modalities have been reviewed elsewhere [15].

For elderly individuals, a greater concern than genital warts is HPV-related dysplasia or carcinoma. Approximately 25% of new cases of invasive cervical cancer occur among women ≥65 years of age, and, of women in this age group, only 52% have had a Papanicolaou (Pap) smear performed within 3 years before detection of disease [16]. HPV DNA has been detected in association with up to 93% of cervical cancers, and the most frequently detected HPV types associated with these cancers are types 16 and 18. A comparative study of cervical cancer in older women (those 62–85 years of age) and younger women (those 28–61 years of age) found that the 2 patient groups were similar with respect to the HPV types detected in association with the cancers, the prevalence of HLA dr1501, and the occurrence of p53 mutations, which suggests that the pathogenesis of cervical cancer in older women is similar to that in younger women [17].

The frequency with which Pap smears should be performed in older women is controversial, with many favoring screening that occurs less frequently than on an annual basis for women who have had normal results of recent Pap smears, and there is no consensus on the age at which screening should be discontinued [18]. A new Bethesda System for reporting cervical cytological results [19] and new guidelines for the management of cervical cytological abnormalities [20] outline the approach
to abnormalities detected during the screening of older women. Colposcopy with directed biopsy is indicated for most squamous abnormalities, except for atypical squamous cells of undetermined significance (ASC-US), for which testing for the high-risk types of HPV-DNA is the preferred method to triage younger women for either immediate colposcopy or more-conservative Pap smear follow-up. For older, postmenopausal women with ASC-US who have clinical or cytological evidence of vaginal atrophy, a reasonable option for follow-up is to prescribe a course of intravaginally administered estrogen (if it is not contraindicated) and to perform a second Pap smear 1 week after completion of the treatment course [20]. If the results of the second Pap smear are negative for intraepithelial lesion or malignancy, then close follow-up with another Pap smear in 4–6 months is indicated. Another finding of ASC-US or a more severe lesion at either follow-up should be evaluated with colposcopy. A finding of atypical glandular cells in older women is ominous, with a recent retrospective study showing that 17% of women >50 years of age who had atypical glandular cells of undetermined significance had some form of cancer [21]. Uterine cancer was more common than cervical cancer; therefore, in women >35 years of age, the recommended workup of atypical glandular cells includes colposcopy with endocervical sampling and endometrial biopsy.

VAGINITIS

Vaginal discharge is a common complaint of women of childbearing age. Of the 3 main causes of vaginitis in younger women—bacterial vaginosis (BV), candidiasis, and trichomoniasis—only trichomoniasis is clearly sexually transmitted. In older, postmenopausal women, vaginitis is less likely to have 1 of these 3 etiologies, and it is more likely to be the result of the atrophic effects of estrogen deficiency. Spinillo et al. [22] compared postmenopausal women with control subjects of reproductive age who were seen at a vaginitis clinic, and they found that only 38% of the postmenopausal women had BV, trichomoniasis, or candidiasis diagnosed, compared with 53% of the control subjects. The lack of estrogen in older women leads to a thinning of the vaginal epithelium and a reduction in epithelial glycogen content, which leads to alteration in the vaginal pH and microflora. The vaginal microflora of women of childbearing age is predominantly facultative lactobacilli, whereas that of postmenopausal women not receiving estrogen therapy shows not only a lower prevalence of lactobacilli but, also, a 10–100-fold lower concentration of these organisms when present [23]. However, in postmenopausal women, yeasts and the organisms associated with BV (e.g., Prevotella bivia, Gardnerella vaginalis, and Mycoplasma hominis) were isolated less frequently in postmenopausal women than in women of childbearing age, which possibly explains the lower incidence of yeast vaginitis and BV among such women [22]. The epidemiology of trichomoniasis in older women is not well known, but trichomoniasis can be asymptomatic, and long-term carriage of the disease in women has been described. Of note, in the study by Spinillo et al. [22], trichomoniasis was significantly more common among postmenopausal women compared with women of reproductive age, although this study population was likely affected by referral bias. Data from Denmark, however, suggest that trichomoniasis affects a population older than that affected by GC and CT, with the average age of women reported to have trichomoniasis being 39 years, compared with 24 years and 22 years for women with GC and CT, respectively [24].

Evaluation for complaints of vaginitis should include a speculum examination of the cervix and vaginal vault, with examination of vaginal secretions on saline wet mount and KOH preparation and by assessment of vaginal pH. These examinations should yield sufficient information to allow for diagnosis of candidiasis, trichomoniasis, or BV, if present. The sensitivity of wet mount for the detection of Trichomonas organisms is estimated to be ~70%, so a more sensitive test would be culture, which is now commercially available (InPouchTV; Biomed Diagnostics). Trichomoniasis should be suspected when a women has an abnormal discharge, an elevated vaginal pH level, and evidence of inflammation (increased number of WBCs) without evidence of cervicitis or candidiasis.

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References