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HSV Curriculum

Genital and Perirectal Herpes Simplex Virus Infection

Herpes Simplex Virus (HSV) Type 2

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HSV Curriculum

Learning Objectives

1. Describe the epidemiology of genital HSV in the U.S.
2. Describe the pathogenesis of genital HSV.
3. Discuss the clinical manifestations of genital HSV.
4. Identify the common methods used in the diagnosis of genital HSV.
5. Describe patient management for genital HSV.
6. Describe public health measures for the prevention of genital HSV.
7. Summarize appropriate prevention counseling messages for genital HSV.

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HSV Curriculum

Lessons

- I. Epidemiology: Disease in the U.S.
- II. Pathogenesis
- III. Clinical manifestations
- IV. Diagnosis
- V. Patient management
- VI. Prevention

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Lesson I: Epidemiology: Disease in the U.S.

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HSV Curriculum Epidemiology

Background and Burden of Disease

- Genital herpes is a chronic, lifelong viral infection
- Two HSV serotypes – HSV-1 & HSV-2
- HSV-2 causes most cases of recurrent genital herpes in the U.S.
- Approximately 776,000 new cases occur each year

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HSV Curriculum Epidemiology

Background and Burden of Disease (continued)

- In the U.S., 16.2% of adults aged 14–49 years have HSV-2 antibodies
- HSV-2 antibodies are not routinely detected until puberty
- HSV-2 seroprevalence is higher in women than men in all age groups and varies by race/ethnicity

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HSV Curriculum Epidemiology

Transmission (continued)

- Likelihood of transmission declines with increased duration of infection
- Incubation period after acquisition is 2–12 days (average is 4 days)
- Drying and soap and water readily inactivate HSV; fomite transmission unlikely

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HSV Curriculum Epidemiology

HSV-2 and HIV Infection

- HSV-2 infection increases the risk of acquiring HIV infection at least 2-fold
- HSV-2 infection is also likely to facilitate transmission of HIV infection from persons co-infected with both viruses

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Lesson II: Pathogenesis

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HSV Curriculum Pathogenesis

Virology

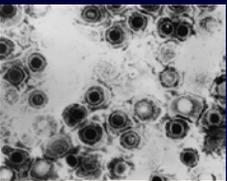
- HSV-1 and HSV-2 are members of the human herpes viruses (herpetoviridae)
- All members of this species establish latent infection in specific target cells
- Infection persists despite the host immune response, often with recurrent disease

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HSV Curriculum Pathogenesis

Transmission electron micrograph of Herpes Simplex Virus



Source: CDC Public Health Image Library/Dr. Erskine Palmer

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HSV Curriculum Pathogenesis

Pathology

- The virus remains latent indefinitely
- Reactivation is precipitated by multiple known and unknown factors and induces viral replication
- The re-activated virus may cause a cutaneous outbreak of herpetic lesions or subclinical viral shedding
- Up to 90% of persons seropositive for HSV-2 antibody have not been diagnosed with genital herpes

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Lesson III: Clinical Manifestations

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HSV Curriculum Clinical Manifestations

Definitions of Infection Types

First Clinical Episode

- Primary infection
 - First infection ever with either HSV-1 or HSV-2
 - No antibody present when symptoms appear
 - Disease is more severe than recurrent disease
- Non-primary infection
 - Newly acquired HSV-1 or HSV-2 infection in an individual previously seropositive to the other virus
 - Symptoms usually milder than primary infection
 - Antibody to new infection may take several weeks to a few months to appear

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HSV Curriculum Clinical Manifestations

Definitions of Infection Types

Recurrent symptomatic infection

- Antibody present when symptoms appear
- Disease usually mild and short in duration

Asymptomatic infection

- Serum antibody is present
- No known history of clinical outbreaks

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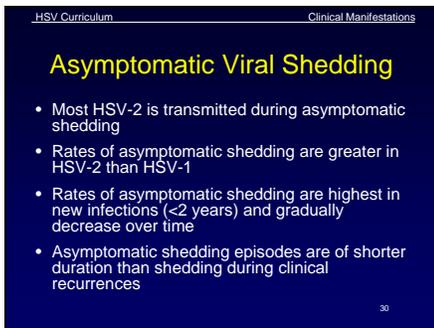
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HSV Curriculum Diagnosis

HSV Diagnosis

- Clinical diagnosis is insensitive and nonspecific
- Clinical diagnosis should be confirmed by laboratory testing:
 - Virologic tests
 - Type-specific serologic tests

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HSV Curriculum Diagnosis

Virologic Tests

- Viral culture (gold standard)
 - Preferred test if genital ulcers or other mucocutaneous lesions are present
 - Highly specific (>99%)
 - Sensitivity depends on stage of lesion; declines rapidly as lesions begin to heal
 - Positive more often in primary infection (80%–90%) than with recurrences (30%)
 - Cultures should be typed
- Polymerase Chain Reaction (PCR)
 - More sensitive than viral culture; has been increasingly used instead of culture in many settings
 - May be a reasonable choice for diagnosing genital lesions; the assays are FDA-cleared for use with anogenital specimens and commercially available
 - Preferred test for detecting HSV in spinal fluid

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Virologic Tests (continued)

- Antigen detection (DFA or EIA)
 - Moderately sensitive (>85%) in symptomatic shedders
 - Rapid (2–12 hours)
 - May be better than culture for detecting HSV in healing lesions
- Cytology (Tzanck or Pap)
 - Insensitive and nonspecific and should not be relied on for HSV diagnosis

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Type-specific Serologic Tests

- Type-specific and nonspecific antibodies to HSV develop during the first several weeks to few months following infection and persist indefinitely
- Presence of HSV-2 antibody indicates anogenital infection
- Presence of HSV-1 does not distinguish anogenital from orolabial infection

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HSV Curriculum Diagnosis

Uses of Type-specific Serologic Tests

- Type-specific serologic assays might be useful in the following scenarios:
 - Recurrent or atypical genital symptoms with negative HSV cultures
 - A clinical diagnosis of genital herpes without laboratory confirmation
 - A sex partner with herpes
 - As part of a comprehensive evaluation for STDs among persons with multiple sex partners, HIV infection, and among MSM at increased risk for HIV acquisition

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Evaluation of Genital, Anal or Perianal Ulcer

- All patients with genital, anal or perianal ulcers should be evaluated with a serologic test for syphilis and a diagnostic evaluation for genital herpes
- In settings where chancroid is prevalent, a test for *Haemophilus ducreyi* should also be performed

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Lesson V: Patient Management

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HSV Curriculum Management

Principles of Management of Genital Herpes

- Counseling should include natural history, sexual and perinatal transmission, and methods to reduce transmission
- Antiviral chemotherapy
 - Partially controls symptoms of herpes
 - Does not eradicate latent virus
 - Does not affect risk, frequency or severity of recurrences after drug is discontinued

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Antiviral Medications

- Systemic antiviral chemotherapy includes 3 oral medications:
 - Acyclovir
 - Valacyclovir
 - Famciclovir
- Topical antiviral treatment is not recommended

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Management of First Clinical Episode of Genital Herpes

- Manifestations of first clinical episode may become severe or prolonged
- Antiviral therapy should be used
 - Dramatic effect, especially if symptoms <7 days and primary infection (no prior HSV-1)

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CDC-Recommended Regimens for First Clinical Episode

- Acyclovir 400 mg orally 3 times a day for 7–10 days,
or
- Acyclovir 200 mg orally 5 times a day for 7–10 days,
or
- Famciclovir 250 mg orally 3 times a day for 7–10 days,
or
- Valacyclovir 1 g orally twice a day for 7–10 days

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Recurrent Episodes of Genital Herpes

- Most patients with symptomatic, first-episode genital HSV-2 experience recurrent outbreaks
- Episodic and suppressive treatment regimens are available
- Treatment options should be discussed with ALL patients

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Suppressive Therapy for Recurrent Genital Herpes

- Reduces frequency of recurrences
 - By 70%-80% in patients with > 6 recurrences per year
 - Also effective in those with less frequent recurrences
- Reduces but does not eliminate subclinical viral shedding
- Periodically (e.g., once a year), reassess need for continued suppressive therapy

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CDC-Recommended Regimens for Suppressive Therapy

- Acyclovir 400 mg orally twice a day, or
- Famciclovir 250 mg orally twice a day, or
- Valacyclovir 500 mg orally once a day, or
- Valacyclovir 1 g orally once a day

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Episodic Treatment for Recurrent Genital Herpes

- Ameliorates or shortens duration of lesions
- Requires initiation of therapy within 1 day of lesion onset
- Provide patient with a supply of drug or a prescription and instructions to self-initiate treatment immediately when symptoms begin

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Genital Herpes in Pregnancy

- Majority of mothers of infants who acquire neonatal herpes lack histories of clinically evident genital herpes
- Risk for transmission to neonate is high (30%-50%) among women who acquire genital herpes near the time of delivery
- Risk is low (<1%) in women with histories of recurrent herpes at term or who acquire genital HSV during the first half of pregnancy

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HSV Curriculum Management

Genital Herpes in Pregnancy (continued)

- Prevention of neonatal herpes depends on:
 - ✓ avoiding acquisition of HSV during late pregnancy
 - ✓ avoiding exposure of the infant to herpetic lesions during delivery
- All pregnant women should be asked whether they have a history of genital herpes

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HSV Curriculum Management

Genital Herpes in Pregnancy (continued)

- At the onset of labor:
 - All women should be questioned carefully about symptoms of genital herpes, including prodromal
 - All women should be examined carefully for herpetic lesions
- Women without symptoms or signs of genital herpes or its prodrome can deliver vaginally

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HSV Curriculum Prevention

Patient Counseling and Education

- Counseling should include:
 - Natural history of the infection
 - Treatment options
 - Transmission and prevention issues
 - Neonatal HSV prevention issues
- Emphasize potential for recurrent episodes, asymptomatic viral shedding, and sexual transmission

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HSV Curriculum Prevention

Counseling: Natural History

- Recurrent episodes likely following a first episode; with HSV-2 more than HSV-1
 - Frequency of outbreaks may decrease over time
 - Stressful events may trigger recurrences
 - Prodromal symptoms may precede outbreaks
- Asymptomatic viral shedding is common and HSV transmission can occur during asymptomatic periods

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HSV Curriculum Prevention

Counseling: Treatment Options

- Suppressive therapy available and effective in preventing symptomatic recurrences
- Episodic therapy sometimes useful in shortening duration of recurrent episodes
- Explain when and how to take antiviral medications
- Educate how to recognize prodromal symptoms to determine when to begin episodic therapy

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HSV Curriculum Prevention

Counseling: Transmission and Prevention

- Inform current and future sex partners about genital herpes diagnosis
- Abstain from sexual activity with uninfected partners when lesions or prodrome present
- Correct and consistent use of latex condoms might reduce the risk of HSV transmission
- Valacyclovir suppressive therapy decreases HSV-2 transmission in heterosexual couples in which source partner has recurrent herpes

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HSV Curriculum Prevention

Counseling: Neonatal Herpes Prevention

- Risk of neonatal HSV infection should be explained to all patients, including men
- Pregnant women should inform their prenatal/perinatal providers that they have genital herpes
- Pregnant women without HSV-2 infection should avoid intercourse during third trimester with men who have genital herpes
- Pregnant women without HSV-1 infection should avoid oral sex from a partner with oral herpes

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HSV Curriculum Prevention

Counseling for Asymptomatic Persons

- Give asymptomatic persons diagnosed with HSV-2 infection the same counseling messages as symptomatic persons
- Teach the common manifestations of genital herpes, as many patients will become aware of them with time

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HSV Curriculum Case Study

Physical Exam

- Vital signs: blood pressure 112/68, pulse 58, respiration 13, temperature 38.5° C
- Cooperative, good historian
- Chest, heart, musculoskeletal, and abdominal exams within normal limits
- Uterus consistent with a 6-week pregnancy
- Normal vaginal exam without signs of lesions or discharge
- No lymphadenopathy

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HSV Curriculum Case Study

Questions

1. Which HSV general education messages should be discussed with Roberta?
2. Given that Roberta's husband Franklin has a history of genital herpes, would it be appropriate to test Roberta for genital herpes using a type-specific serologic test?
3. What other STD screening should be considered for Roberta?

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HSV Curriculum Case Study

Roberta's Laboratory Results

- HSV gG-based type-specific serologies: HSV-1 negative; HSV-2 positive
- NAAT probe for *Chlamydia trachomatis*: negative
- NAAT for *Neisseria gonorrhoeae*: negative
- RPR: nonreactive
- HIV antibody test: negative
- Pregnancy test: positive

4. What would you tell Roberta about her HSV infection, based on clinical manifestations and test results?
5. Would routine viral cultures during Roberta's pregnancy be recommended?

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HSV Curriculum Case Study

Questions

8. What questions should be asked of ALL women beginning labor?
9. If Roberta has genital herpetic lesions at the onset of labor, should she deliver vaginally or abdominally? What is the risk to the infant?

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HSV Curriculum Case Study

Questions

10. Roberta is asymptomatic at the time of delivery. Is it medically appropriate for her to deliver vaginally?
11. If Roberta had acquired genital herpes around the time of delivery, would she be more or less likely to transmit genital herpes to her baby during a vaginal delivery than if she had a history of recurrent genital herpes?

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