Seroprevalence of Herpes Simplex Virus Type 2 in the United States: Results from the National Health and Nutrition Examination Survey (NHANES), 2005–2008

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Objective

To determine the seroprevalence of HSV-2 infection using 2005-2008 population-based data

Background

• Herpes simplex virus type 2 (HSV-2) infection is one of the most common STIs
• Main cause of genital herpes and neonatal herpes
• Clinical course and transmission:
  - Lifelong infection, thus seroprevalence best method to estimate HSV-2 prevalence
  - May manifest as recurrent, painful genital lesions, but most infections unrecognized
  - Subclinical viral shedding is frequent and transmission occurs without symptoms
• Increased risk of HIV acquisition at least 2-fold
• Population-based trends since 1976:
  - Decreasing trend in HSV-2 seroprevalence during the last decade found by Xu et al.
  - Unclear if decreasing trend is continuing

Methods

• Data from National Health and Nutrition Examination Survey (NHANES), 2005-2008
  - Complex probability sampling used to represent the civilian, non-institutionalized U.S. population
  - Adolescents, Mexican-Americans, and non-Hispanic blacks oversampled
  - Participants interviewed, examined, and biologic samples collected
  - Overall examination rate = 88%
• HSV-2 antibodies detected using a type-specific immunodot assay
  - Participants aged 14-49 years (n=7,293)
• HSV-2 seroprevalence estimated by age, sex, race/ethnicity, and lifetime sex partners
  - Weighted seroprevalence, 95% confidence intervals (CI) generated by SUDAAN® to account for complex survey design

Results

HSV-2 Seroprevalence among 14-49-year-olds, by sex

- Overall HSV-2 seroprevalence among 14-49-year-olds by sex:
  - Males: 16.2% (95% CI: 14.6-17.9)
  - Females: 20.9% (18.9-23.1)

- HSV-2 seroprevalence higher among females after stratifying by age (p <.001)
- HSV-2 seroprevalence increases with age (p <.001)

- Overall HSV-2 seroprevalence compared with NHANES 1999-2004 estimate
  - Among HSV-2 infected, proportion with undiagnosed infection calculated
  - “Has a doctor or other health care professional ever told you that you had genital herpes?”

- Overall HSV-2 seroprevalence estimated by sex, race/ethnicity, and lifetime sex partners
  - Experienced an increase with age and lifetime number of sex partners

- Seroprevalence by Number of Lifetime Sex Partners and Race/Ethnicity

- Overall HSV-2 seroprevalence increases with number of lifetime sex partners for all sex/sexually active groups (p<0.001)

- Seroprevalence high among non-Hispanic blacks even with few lifetime sex partners, with any 4 partners, seroprevalence 54%

Discussion

• Substantial proportion of U.S. population infected with HSV-2
  - Most undiagnosed, many may have symptoms: need to raise awareness of signs/symptoms among patients/clinicians

  - Treatment available to reduce symptoms, and daily suppressive therapy can reduce transmission to sex partner by 50%

• Burden of HSV-2 especially important given strong synergy between HSV-2 and HIV infection
  - HIV testing and risk-reduction strategies important for those with known HSV-2 infection and those at high risk for HSV-2

• Disparities in HSV-2 infection prominent, probably contribute to disparities in HIV infection
  - Women more susceptible to HSV than men, likely due to biological differences (e.g., greater mucosal surface area)

• Racial disparities likely perpetuated by higher prevalence in black communities; greater chance of exposure with any sexual encounter

• Prevention: combination of strategies will likely be needed and optimal approach unknown

  - General risk-reduction strategies important, e.g., condom use can reduce risk of HSV-2 acquisition

  - Serologic testing could identify unrecognized HSV-2 infections, but role of screening controversial

  - Limited data on benefits of screening to change behavior and reduce HSV transmission on population level

  - Generalized screening not recommended, but may be useful in selected high-risk populations

Next Steps

• Continued research on HSV-2 prevention strategies including:
  - Evaluating the overall benefit, feasibility, and cost effectiveness of serologic testing to prevent transmission
  - Evaluating the judicious use of suppressive therapy regimens for prevention in various populations

• Continued research into the development of HSV-2 vaccine