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Syphilis among adolescents and young adults in Cincinnati, Ohio: testing, infection and characteristics of youth with syphilis infection

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Abstract

Little is known about the epidemiology of syphilis among adolescents and young adults. This study examined, among more than 17 000 young people aged 13–22 years old, trends in rates of syphilis testing and infection; characteristics of infected adolescents; and agreement about syphilis staging and treatment between provider and chart reviewer. Rates of syphilis testing increased but rates of syphilis infection did not increase significantly over a 5-year period. A majority of infected men reported only opposite-sex sexual contact. High agreement between providers and chart reviewers was found. These findings demonstrate the need for complete assessment of risk factors and use of local epidemiology in screening practices.

Introduction

National syphilis screening recommendations are guided by epidemiological data,^{1,2} which have changed over time. However, little is known about the epidemiology of syphilis among youth. We sought to describe, among adolescents and young adults seen at a large, urban clinic in the US: (i) changes in rates of syphilis testing and infection; (ii) characteristics of adolescents diagnosed with syphilis; and (iii) agreement about syphilis staging and treatment between documentation in the medical record and review of documentation by chart reviewers using treatment guidelines.²

Methods

We conducted a retrospective chart review of records of sexually experienced 13–22-year-olds obtaining primary care services from an adolescent and young adult clinic in Cincinnati, Ohio between 1 October 2005 and 30 September 2010. Analyses were conducted using data pulled from electronic medical records (EMR) and data abstracted from clinician documentation by chart reviewers (SPR, TM, LW, CL, JH). Rates of syphilis testing and

infection for each of five 1-year periods were calculated and compared using a χ^2 test of trend. Descriptive analyses examined characteristics of youths with syphilis. Cohen's Kappa coefficient measured the agreement about syphilis staging and treatment between provider and chart reviewer.

Results

Overall, 17 651 patients were included: 81% women, 67% Black and 91% insured. The mean age was 17 years (s.d. 1.9). Rates of syphilis testing increased significantly for men and women over the five time periods. Rates of syphilis infection did not significantly change for either men or women over time (Table 1).

Thirty-one women were diagnosed with syphilis; 20 were symptomatic. The mean number of lifetime partners was 10.1. Over half had a prior sexually transmissible infection (STI), including *Neisseria gonorrhoeae* (GC) and/or *Chlamydia trachomatis* (CT) ($n = 25$), *Trichomonas vaginalis* ($n = 8$) and herpes simplex virus (HSV) ($n = 5$). None had HIV. Eight reported a history of substance abuse.

Six men were diagnosed with syphilis; two were symptomatic. The mean number of lifetime partners was 6.3; one reported having male partners. One had prior STIs (GC). None had HSV or HIV. Three reported a history of substance abuse.

There was large agreement (kappa = 0.74) for syphilis staging as well as for appropriate treatment (kappa = 0.75) between the chart documentation and chart reviewers.

Discussion

The rate of syphilis testing among sexually active men and women increased over time, while the rate of syphilis infection among those tested did not change. The increase in testing is likely multifactorial and may be partly due to increases in HIV testing related to the 2006 Centers for Disease Control and Prevention's HIV testing guidelines.^{3,4} Due to the low number of cases of syphilis, we may not have had sufficient power to detect a change in rates of syphilis over time. We found that the rates of syphilis infection were similar in men and women, which differs from national and local data that demonstrates that the majority of syphilis infection occur in men.^{5,6} This finding may be due, in part, to the fact that the majority of patients included in our study were women.

Characteristics of adolescents diagnosed with syphilis differed from previous reports.⁷⁻⁹ Infection occurred in women and men at similar rates and few men with syphilis infection reported a same sex partner. These findings suggest: (i) syphilis screening should include considerations of local epidemiological data; (ii) assessing all risk factors is an important component in deciding who warrants syphilis testing; and (iii) heterosexual and HIV-uninfected men should be screened for syphilis based on risk factors (e.g. STIs, substance abuse).

We found substantial, but not perfect, agreement about syphilis staging and treatment between the treating clinician and chart reviewer. Because staging of syphilis dictates the

treatment regimen, accurate staging is critical. Educational interventions for clinicians or incorporating tools to review staging and treatment into an EMR may facilitate accurate staging and appropriate treatment.

Our findings support current recommendations that syphilis screening should be based on local epidemiological data and that assessment of risk factors is integral to identifying those at highest risk of infection. Interventions designed to improve clinical staging and appropriate treatment choices of syphilis are needed.

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Number of sexually active adolescents and young adult men and women (13–22 years old) per year tested for and infected with syphilis between 2005 and 2010

Table 1.

	1 (1 Oct 05– 30 Sept 06)	2 (1 Oct 06– 30 Sept 07)	3 (1 Oct 07– 30 Sept 08)	4 (1 Oct 08– 30 Sept 09)	5 (1 Oct 09– 30 Sept 10)	<i>P</i> -value for trend
Total number of sexually active adolescents, <i>n</i>						
Men	576	658	727	718	705	
Women	2744	2873	2965	2916	2770	
Tested, <i>n</i> (%) ^A						
Men	84 (14.6)	203 (30.9)	201 (27.6)	306 (42.6)	472 (67)	<0.001*
Women	235 (8.6)	517 (18)	540 (18.2)	893 (30.6)	1315(48)	<0.001*
Infected, <i>n</i> (%) ^A						
Men	0	1 (0.5)	1 (0.5)	1 (0.3)	3 (0.6)	1.0**
Women	0	1 (0.2)	3 (0.6)	5 (0.6)	22 (1.7)	0.06**

^A Percentages are calculated as – Tested for syphilis: the number of patients tested for syphilis among sexually experienced adolescents; Syphilis Infected: the number of adolescents infected with syphilis among adolescents tested for syphilis.

* *P*-value calculated using the χ^2 test of trend between Year 1 and Year 5.

** *P*-value calculated using Fisher's exact test of trend between Year 1 and Year 5.