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The Proportion of Young Women Tested for Chlamydia Who Had Urogenital Symptoms in Physician Offices

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Abstract

Using National Ambulatory Medical Care Survey data from 2006 to 2015, we estimated the proportions of young women tested for chlamydia who were symptomatic (urogenital symptoms) or asymptomatic in physician offices. Among women tested for chlamydia, the proportions of women with and without urogenital symptoms were 31.6% and 59.2%, respectively.

Chlamydia was the most common notifiable sexually transmitted disease, with 1.6 million infections reported in the United States in 2016.[1] There was an increase of 4.7% in the rates of reported chlamydia cases from 2015 to 2016, and the highest prevalence was among females and among adolescents and young adults aged 15 to 24 years.[1] A recent study suggested the chlamydia prevalence among sexually active females 14 to 24 years of age was 4.7% overall and 13.5% among non-Hispanic black females.[2]

Among women, chlamydial infections are usually asymptomatic, and if they remain undiagnosed and untreated, they can cause pelvic inflammatory disease (PID), which can further lead to infertility, chronic pelvic pain, and ectopic pregnancy.[3] Infertility as a result of PID can be attributed in 8% women with one episode of PID, and the rate increases to 19.5% and 40.0% for second and third occurrences of PID, respectively.[4] Because of the high prevalence of chlamydia and associated morbidity and reproductive sequelae of chlamydia infection, the Centers for Disease Control and Prevention (CDC) and US Preventive Services Task Force recommend annual chlamydia screening for all sexually active women younger than 25 years and women at least 25 years old with increased risk (e.g., multiple sex partners).[3,5–8] Chlamydial infection is asymptomatic in up to 70% to 75% of women[8–11]; thus, screening tests play a crucial role in detection, prevention, testing, and treatment of chlamydia. Chlamydia screening in the United States is monitored by the National Committee for Quality Assurance, which uses the Healthcare Effectiveness Data

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and Information Set (HEDIS) for chlamydia testing.[12] Chlamydia screening rates increased from 23.1% in 2001 to 47.4% in 2015 among sexually active women aged 16 to 24 years who were enrolled in an health maintenance organization plans and from 26.9% in 2005 to 43.4% in 2015 for preferred provider organization (PPO) plans for commercial insurance.[13] Chlamydia screening rates increased from 40.4% in 2001 to 55.2% in 2015 for women enrolled in Medicaid health maintenance organization plans.[13] The increase in HEDIS rates is generally assumed to indicate greater chlamydia screening, but women can also be tested as a result of signs or symptoms. Our results may help allocate resources efficiently for screening interventions in physician offices and eventually help reduce chlamydia in communities with high burden of infection. Only one earlier study has emphasized the missed opportunities in potential chlamydia testing of nonpregnant women using National Ambulatory Medical Care Survey (NAMCS) data.[14] The objectives of this study were to estimate the proportions of young women tested for chlamydia who were symptomatic (urogenital symptoms) or asymptomatic in physician offices and to assess the time trend of these proportions.

Our analysis included NAMCS data from 2006 to 2015. The NAMCS is a national probability survey conducted by CDC annually of nonfederally employed office-based physicians. Detailed description of methodology used in designing, conducting, and analysis of surveys is provided elsewhere.[15–17] The overall range for the response rate of fully participating physicians from 2006 to 2014 was 39.4% to 65.4%.[15–18] We identified women who were tested for chlamydia at physician offices using the variable “chlamydia test” in NAMCS. We identified women with urogenital symptoms using *International Classification of Disease, Ninth Revision (ICD-9)* codes. We also used *ICD-9* codes for evaluation or other sexually transmitted disease (STD) consultation services or conditions that may have prompted a provider to order a chlamydia test. We separated women aged 15 to 25 years with chlamydia testing into 3 hierarchical groups. First, we placed women into the urogenital symptoms group if they had any *ICD-9* codes with urogenital symptoms (Appendix, http://links.lww.com/OLQ/A268). Second, we identified women as an asymptomatic group. This group included women who received an evaluation or consultation with a provider. Finally, the third group was women who neither presented with urogenital symptoms nor had any evaluation done by a provider. We estimated the proportion of women who received chlamydia testing, who presented with urogenital symptoms, and who were asymptomatic. These proportions were further stratified by age group, precoded race/ethnicity, region, and survey year. We used SUDAAN callable SAS software version 9.3 (SAS Institute, Cary, NC) to account for the complex survey design. We only reported subgroup estimates that had an unweighted sample size of 30 or more and a relative SE of 30% or less of the estimate for the reliability of the estimates reported.[19]

Annually, 2.1 million women aged 15 to 25 years were tested for chlamydia from 2006 to 2015. Of these women tested for chlamydia, 31.6% had urogenital symptoms and 59.2% did not have any evidence of urogenital symptoms (Table 1). The proportion of women with urogenital symptoms were not significantly ($P < 0.05$) different in the 2 survey groups. The proportion of women with urogenital symptoms was also not significantly different ($P < 0.05$) by age, race/ethnicity, or region.

According to the CDC and US Preventive Services Task Force guidelines, annual chlamydia testing should be performed on all sexually active women aged 15 to 25 years, although providers may be more likely to perform chlamydia test on those women presenting with urogenital symptoms. Of women aged 15 to 25 years who had chlamydia tests, our result showed 31.6% women with and 59.2% women without urogenital symptoms. Our result that 59.2% of testing was among women without urogenital symptoms is both encouraging and challenging: many women without urogenital symptom were screened for chlamydia according to the recommendations, but there is still plenty of room for improvement on chlamydia testing among sexually active young women because only approximately 43.4% of sexually active women were tested for chlamydia in the 2015 HEDIS report.[19]

Our study also showed that the total number of chlamydia testing among women aged 15 to 25 years and the proportions of chlamydia testing for women aged 15 to 25 years without urogenital symptoms did not change statistically significantly between 2006–2010 and 2011–2015, indicating that chlamydia screening practice has not significantly changed during these 2 periods despite provisions in the law making annual chlamydia screening for insured women younger than 25 years available at no cost. On the basis of our result, 59.2% of women with chlamydia testing were asymptomatic and 43.4% of chlamydia testing rate reported among sexually active women enrolled in PPO in the 2015 HEDIS report,[20] and the chlamydia screening rate for sexually active women in PPO would be 25.7% (43.4% × 59.2%). With the fact that chlamydia testing still is suboptimal[13] and current chlamydia testing practices have not changed in recent years, interventions may help improve health care provider adherence to chlamydia screening guidelines. A recent study found that cost-effective interventions can be successfully designed to routinely collect specimen for STD testing by changing patient flow in clinical setting, using screening reminders through electronic health record systems, and training staff for frequent reminders to patients via text, e-mail, or postcard to encourage screening or re-screening for STDs.[21]

One of the strengths of this study is that we used a weighted national probability provider-based survey sample from 2006 to 2015. There are several limitations in our study. First, only physicians that provide care in office settings were included, so midlevel practitioners, certified nurse, midwives, nurse practitioners, and physician assistants were excluded, which would underestimate the number of chlamydia testing in physician offices. Second, recent expansion of low complexity care provided by midlevel non-physician providers may have greater impact on the number of chlamydia tests in physician office and may also have impact on our result. Third, NAMCS is visit based; the medical history of women who received asymptomatic versus symptomatic testing was not available. Factors that were unobservable in the NAMCS data may have motivated provider coding and service provision on the visit that was included in the sample. Finally, with low and varied response rate from 2006 to 2014, our results may not be fully representative of the patients who visited physician offices.

As noted earlier, chlamydia testing among women 25 years or younger continues to be a challenging task for health care providers because of limited provider time, lack of recognition of opportunities to screen, and difficulty to talk about sex activity with young women.[22–24] Low chlamydia screening rates among young women not only pose significant

challenges to women's sexual and reproductive health but also fuel the complexity in controlling the burden of disease as many women with chlamydial infection may be left unscreened, undiagnosed, and untreated. This also poses a potential transmission risk. Chlamydia testing when performed at the time of evaluation presents an opportunity for early detection and prevention of sequelae of chlamydia-associated diseases and allows for timely treatment. Further emphasis on sexual health care for relatively common asymptomatic infections is needed to promote health care provider adherence to chlamydia screening guidelines and educate the public regarding high-prevalence, low-screening, and preventive measures that address unintended consequences of PID, ectopic pregnancy, and infertility.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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TABLE 1.

Classification of Women Aged 15–25 Years Tested for Chlamydia by Years, Age Groups, Race, and Region, National Ambulatory Medical Care Surveys 2006–2015

	Chlamydia Testing Among Women							
	Total Women Tested for Chlamydia	**Weighted Size**	**With Urogenital* Symptoms, %**	**Confidence Interval—95% Limit**	**Without Urogenital* Symptoms, %**	**Confidence Interval—95% Limit**	**Other†, %**	**Confidence Interval—95% Limit**
	739	20,968,770	31.6	26.8–36.8	59.2	53.5–64.6	9.3	6.8–12.5
Years								
2006–2010	362	10,451,040	31.2	23.8–39.7	59.9	51.3–67.9	8.9	5.6–14.0
2011–2015	377	10,517,730	31.9	26.6–37.8	58.5	51.7–65.0	9.6	6.4–14.2
Age groups, y								
15–20	317	8,517,090	33.2	25.4–42.0	59.1	50.3–67.4	7.8	4.6–12.7
21–25	422	12,451,680	30.5	25.2–36.3	59.3	51.9–66.2	10.3	6.9–15.1
Race								
Non-Hispanic white	347	9,997,760	29.8	22.8–37.9	59.8	51.6–67.4	10.4	6.9–15.6
Non-Hispanic black	209	5,586,420	43.7	30.5–57.8	53.1	39.4–66.3	3.3	1.3–7.7
Hispanic	133	4,413,080	20.6	10.3–36.8	66.7	56.5–75.5	12.8	6.6–23.1
Other	50	971,510	30.2	15.4–50.6	54.3	34.6–72.8	15.5	5.8–35.6
Region								
Northeast	128	3,496,080	26.9	17.0–39.7	56.2	43.1–68.4	17.0	9.2–29.1
Midwest	209	3,478,070	35.1	26.5–44.7	56.4	46.2–66.1	8.5	4.5–15.5
South	240	9,976,130	30.5	23.1–39.0	61.5	51.8–70.4	8.1	4.6–13.6
West	162	4,018,490	35.4	25.3–47.1	58.4	47.2–68.8	6.2	3.0–12.1

*"Without Urogenital Symptoms"—a group of women who had an evaluation or consultation encounter with a provider.

†"Other"—a group of women who neither presented with chlamydial symptoms nor had any evaluation done by a provider.