

Prevalence of Chlamydia in Young Men in the United States From Newly Implemented Universal Screening in a National Job Training Program

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Objective: The objective of this study was to examine chlamydia prevalence and its risk factors from the first universal screening in socioeconomically disadvantaged young men.

Goal: The goal of this study was to evaluate the need for universal screening in young men.

Study Design: We calculated chlamydia prevalence by demographic and geographic characteristics from 51,478 men aged 16 to 24 years who were screened from July 2003 to December 2004.

Results: Overall, chlamydia prevalence was 8.2%. Only 2.4% of the young men had sexually transmitted disease symptoms. Blacks had the highest prevalence (13.0%), whereas non-Hispanic whites had the lowest (3.1%). Men who smoked marijuana had a significantly higher prevalence compared with those who did not (11.9% vs. 6.4%). Men who used cocaine or PCP also had a significantly higher chlamydia prevalence compared with those who did not. Men who lived in the southern region of the United States had the highest prevalence.

Conclusions: Chlamydial infection is highly prevalent among socioeconomically disadvantaged young men. Young men entering the National Job Training Program represent an important population for screening.

CHLAMYDIA TRACHOMATIS IS THE MOST commonly reported bacterial sexual transmitted disease (STD) in the United States, causing serious sequelae if left untreated. Treatment of chlamydial infection is inexpensive and effective. However, a high percentage of infected women (approximately 70%) and men (approximately 60%) are asymptomatic¹ and do not seek treatment. Untreated infection may cause pelvic inflammatory disease (PID), chronic pelvic pain, ectopic pregnancy, and infertility in women^{2,3} and urethritis, epididymitis, and prostatitis in men.¹ Because women with infection experience the most severe consequences and are more often asymptomatic, prevention efforts in the United States have been primarily focused on young women. These efforts include screening and treatment programs and partner management to reduce reinfection.⁴

Although chlamydial infection in men is not as serious as in women, recent studies suggest that some sequelae may develop, including couple infertility.^{5,6} Furthermore, untreated chlamydial

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infection in men may serve as an important reservoir for chlamydia⁷ resulting in repeated transmissions of the infection to sex partners. One study documented that asymptomatic untreated men remained infected almost 3 years preceding the treatment of their female sex partners.⁸ This repeated transmission is likely because in the United States, there is no widespread screening in men who do not seek healthcare services. Studies have reported high recurrent infection (15–25%) among young women within 6 months of treatment.^{9,10} Infected male sex partners may contribute substantially to this recurrent infection.

As part of a prevention effort, the National Job Training Program (NJTP) began conducting chlamydia screening and treatment for all men who enroll in the program. This screening program in men became feasible after the introduction of noninvasive, urine-based chlamydia testing. The NJTP is an occupational training program for socioeconomically disadvantaged persons aged 16 to 24 years (i.e., high school dropouts, those in need of additional education, vocational training, or assistance to hold meaningful employment). In 2002, approximately 83% of the enrollees were from minority groups, 75% were high school dropouts, and 27% were from families on public assistance.¹¹ Because sexually active young men are at high risk for chlamydial infection, the NJTP implemented universal chlamydia screening for men in July 2003 as part of the entrance physical examination at 119 program centers across the country. This is the first widespread universal chlamydia screening program for men in the United States. The objectives of this article are to examine the chlamydia prevalence in young men aged 16 to 24 years from July 2003 through December 2004 and to identify factors associated with chlamydial infection.

Methods

All men aged 16 to 24 years who were enrolled and screened at the training program from July 2003 through December 2004 were included in this analysis. Men received a physical examination within 14 days of enrollment into the program. During this examination, a urine specimen was collected and sent to a contract laboratory for the detection of chlamydial infections by strand displacement assay (BDProbeTec ET; Becton-Dickinson, Sparks, MD). The urine specimen was also used to detect use of illegal

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TABLE 1. Chlamydia Prevalence and Odd Ratios by Selected Characteristics in Men Aged 16 to 24 Y at Entrance Into the National Job Training Program, 2003–2004

Characteristic	No. Tested (%)	No. Positive (%)	Adjusted Odds Ratio* (95% confidence interval)
Year of test			
2003 (July–Dec)	16,157 (31.4)	1272 (8.1)	0.9 (0.9–1.0)
2004	35,321 (68.6)	2900 (8.3)	(Reference)
Age (years)			
16–19	35,287 (69.0)	2768 (8.0)	0.8 (0.8–0.9)
20–24	16,191 (31.0)	1404 (8.8)	(Reference)
Race/ethnicity			
Black	23,970 (48.2)	3030 (13.0)	4.1 (3.7–4.6)
Asian/Pacific Islander	833 (1.7)	51 (6.2)	2.3 (1.6–3.2)
American Indian	1338 (2.7)	75 (5.7)	1.6 (1.2–2.1)
Hispanic	7634 (15.3)	428 (5.7)	2.0 (1.7–2.3)
White	16,011 (32.2)	492 (3.1)	(Reference)
Region			
South	24,700 (48.9)	2519 (10.4)	1.5 (1.3–1.7)
Midwest	8541 (16.9)	697 (8.2)	1.4 (1.2–1.7)
Northeast	7052 (14.0)	439 (6.4)	1.0 (0.9–1.2)
West	10,216 (20.2)	452 (4.5)	(Reference)
Sexually transmitted disease symptoms			
Yes	1215 (2.4)	190 (16.0)	2.3 (1.9–2.7)
No	50,263 (97.6)	3982 (8.1)	(Reference)
Use of marijuana			
Yes	12,979 (28.7)	1529 (11.9)	1.7 (1.6–1.8)
No	32,209 (71.3)	2052 (6.4)	(Reference)

*Adjusted for other variables in the table.

drugs (marijuana, cocaine, opium, PCP, or amphetamine) using DRI enzyme immunoassay (Microgenics, Fremont, CA). In addition to laboratory test results, information was collected on the presence of STD symptoms at physical examination, demographic information (age, race/ethnicity, and state of residence), and year of test.

We restricted our analysis to men whose specimens were labeled as “entrance examination” because these specimens constituted true screening. In the analysis, we used the following categories: age groups (16–19, 20–24 years), race/ethnicity (white, black, Hispanic, American Indian/Alaska Native, and Asian/Pacific Islander), geographic region (Bureau of the Census regions: Northeast, South, Midwest, and West), presence of STD symptoms, year of test, and use of illegal drugs (use of marijuana, cocaine, opium, PCP, or amphetamine) as demonstrated by the presence of the drug metabolites in the urine at the time of specimen collection. We used logistic regression to adjust the prevalence for age group, race/ethnicity, geographic region, year of test, STD symptoms, and use of marijuana. We used SAS (SAS Institute, Inc., Cary, NC) software for data analyses.

Results

The total number of men who were screened at entrance examination for chlamydia was 16,157 (31.4%) in 2003 (July–December) and 35,321 (68.6%) in 2004 (Table 1). Screening coverage in 2003 (July–December) was 88%. Of 51,478 men, 69.0% were aged 16 to 19 years and 31.0% aged 20 to 24 years. The majority of men were black (48.2%), 32.2% white, and 15.3% Hispanic. Most men came from the southern region (48.9%) with 20.2% from the western, 16.9% from the midwestern, and 14.0% from the north-eastern regions. Only 2.4% of men had STD symptoms at physical examination. The presence of marijuana metabolites (28.7%) was

fairly common, whereas the presence of cocaine (1.3%), opium (0.04%), PCP (0.2%), or amphetamine (1.1%) metabolites was infrequent (data not shown).

The overall chlamydia prevalence was 8.2% (Fig. 1). Chlamydia prevalence was higher among men aged 19 to 24 years compared with those aged 16 to 18 years. Black men had the highest prevalence (13.0%); prevalence was less among Asian/Pacific Islander (6.2%), American Indian (5.7%), Hispanic (5.7%), and white (3.1%) men (Table 1). Men who resided in the south had the highest prevalence (10.4%), whereas those who resided in the west had the lowest prevalence (4.5%). Men who reported STD symptoms had a significantly higher prevalence than those who did not (16.0% vs. 8.1%, respectively). Men who smoked marijuana had a prevalence almost twice of those who did not (11.9% vs. 6.4%, respectively). Similarly, men who used cocaine or PCP had a

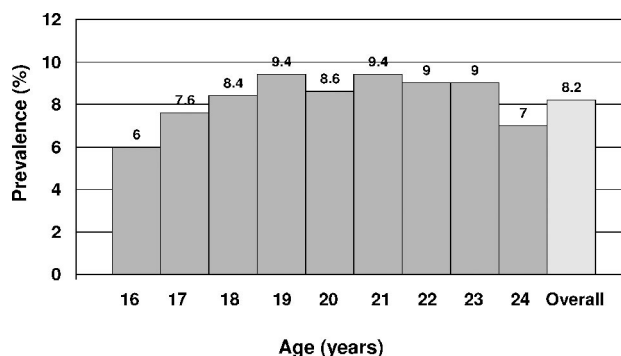


Fig. 1. Chlamydia prevalence among men by age at entrance into the National Job Training Program, 2003–2004.

prevalence almost twice that of men who did not (12.1% vs. 8.0% for cocaine and 14.5% vs. 8.0% for PCP) (data not shown).

In the logistic regression analysis, factors associated with the chlamydial infection in the univariate analysis were also independently associated with the increased risk of chlamydial infection (nonwhite ethnicity, southern and midwestern regions, presence of STD symptoms, and current use of marijuana) (Table 1). Because use of cocaine, opium, PCP, or amphetamine was infrequent and correlated highly with the use of marijuana, we only included the use of marijuana in the logistic regression analysis. We investigated interactions between age group and race/ethnicity, age group and region, and region and race/ethnicity, and found none of these interactions was significant at $P < 0.05$.

Discussion

We found a high prevalence of chlamydia (8.2%) in these socioeconomically disadvantaged young men. To our knowledge, this is the first widespread universal chlamydia screening program for young men in the United States. Previous studies in different settings (general population, army recruits, adolescent men attending juvenile correction facilities, residents of cities from different venues, and young men [aged 18–19 years] from adult jails) in the United States also have reported high prevalence of chlamydia in young men (3.7%, 5.3%, 6.1%, 7.0%, and 10.7%, respectively).^{12–15} In the United Kingdom, a high prevalence of chlamydia in men (13.3%) was reported from a national chlamydia screening program of persons aged <25 years screened at primary care clinics.¹⁶

We found striking race/ethnicity and geographic differences. Blacks had chlamydia prevalence 4 times higher than whites. Previous studies among other populations of young men, including the general population and army recruits, have also reported higher prevalence of chlamydia in blacks than whites.^{12,14} Among all 3 populations (general, army recruits, and NJTP populations), there were substantial race/ethnicity differences—with the largest differences in the general population (11.1% in blacks vs. 1.4% in whites),¹⁴ smaller among the army recruits (11.9% vs. 2.8%)¹² and the NJTP (13.0% vs. 3.1%). Although race/ethnicity differences existed in all 3 populations, the prevalence in blacks was similarly high across the 3 populations (13.0%, 11.9%, and 11.1%). In addition to race/ethnicity differences, we also found geographic differences with the highest prevalence of chlamydia among men from the south (10.6%). A previous study of young men in the general population supports our findings of geographic differences.¹⁴ A variety of complex factors such as social networks, sexual behavior, economic and social inequalities, and lack of access to prevention and treatment services might explain these race/ethnicity and geographic differences.

There are several limitations in this analysis. First, although our findings documented a high prevalence of chlamydia among disadvantaged young men in NJTP, the findings might not be generalizable to other men who did not participate in the NJTP. Second, completeness of chlamydia screening coverage was known only for the last 6 months of 2003 (88%). Because the number of men screened in 2004 (12 months) was almost double the number of men screened in 2003 (6 months), we believe the coverage rate in 2004 was similar to the coverage rate in 2003. Test results were not available if they were performed by a noncontract laboratory or if men had dropped out of the program before undergoing the physical examination. Unfortunately, we did not have information on demographics of those who did not undergo chlamydia screening. Such information could have been used to assess the comparability of demographics characteristics between these 2 groups.

Recently, the Centers for Disease Control and Prevention (CDC)⁴ has recommended universal annual screening for chlamydia only in young women and retesting in 3 to 4 months after initial testing and treatment as a result of high rates of recurrence. This recommendation was derived from the high morbidity and serious sequelae of chlamydial infections in women and the benefits of screening to reduce complications, mainly pelvic inflammatory disease.^{17,18} Universal screening in young men has not been recommended because the benefits of screening in young men have not been demonstrated. However, our study and others continue to demonstrate high prevalence of chlamydia in this group.^{12,13,15,16,19} In the United Kingdom, the prevalence of chlamydia in men was even higher than in women.^{16,20} In this high-prevalence group, screening and treatment of chlamydia have the potential to reduce the chlamydia reservoir in the community and reduce the incidence and prevalence of recurrent infection in women.²¹ Given that chlamydia screening coverage in adolescent women is low,^{22,23} and adolescents may have difficulties seeking health care related to STD,^{24,25} it may be especially important to include screening and treatment for young men and women in high-risk nontraditional settings such as the National Job Training Program.

In summary, the findings of high chlamydia prevalence in young men have program implications. Prevention programs should include testing and treatment, safe sex education, and partner treatment⁴ targeted to disadvantaged out-of-school or out-of-work young men. Because young men can serve as a chlamydia reservoir and thus a source of infection and chlamydia screening coverage in women is low, increasing chlamydia screening in both men and women could help to achieve a successful reduction of chlamydia in the community.

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