

An Ongoing Burden: Chlamydial Infections among Young American Indian Women

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Abstract *Objectives* Studies conducted in the 1980s, when there was limited chlamydia screening, showed high positivity, 23%–30%, among American Indian women. In the 1990s, chlamydia screening and treatment programs were implemented in a variety of settings serving American Indian women including Indian Health Service (IHS) clinics. Yet, a 2000–2001 national survey documented a chlamydia prevalence of 13.3% among young American Indian women, five times higher than the prevalence among whites. The purpose of this analysis was to determine the chlamydia positivity and risk factors for chlamydia among women screened in Indian Health Service (IHS) clinics participating in the National Infertility Prevention Program in 2003. *Methods* Data were analyzed from 11,485 chlamydia tests performed among women universally screened in 23 IHS clinics in three states (Montana, North Dakota, South Dakota). Sexual risk history and clinical data were collected in the Montana IHS

clinics and used to assess risk factors for chlamydial infection in a multivariate logistic regression model. *Results* Chlamydia positivity was highest among 15–19 year old women screened in IHS clinics (state range: 15.3%–18.6%). Positivity decreased with age but remained high even among women aged 30–34 years. Young age and having had multiple or new sex partners in the last 90 days were associated with an increased risk of chlamydia; however, chlamydia positivity was greater than 6.7% for women with no known risk factors. *Conclusions* A greater emphasis on chlamydia screening and treatment should be a component of any program whose goal is to improve the reproductive health of American Indian women.

Keywords Chlamydia · American Indian · Prevalence · Risk factors

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Introduction

Sexually transmitted diseases (STDs), primarily chlamydia and gonorrhea, are the main preventable causes of infertility in women [1]. Chlamydia is the most frequently reported bacterial STD in the United States, with an estimated 2.8 million new cases of chlamydial infections occurring each year [2, 3]. Up to 80% of women infected with chlamydia have no symptoms [4]. Effective prevention efforts must include screening programs to detect and treat asymptomatic infections.

Previous studies have documented high chlamydia positivity among American Indian women. In 1983, Harrison et al. reported very high chlamydia positivities in pregnant Navajo women tested in Gallup (30.6%) and Crownpoint (24.3%), New Mexico [5]. In a 1984 study,

Toomey et al. found an overall chlamydia positivity of 23.0% in young Alaskan Eskimo women; the chlamydia positivity was 39.0% among adolescent females and 30.0% among women seeking prenatal care [6]. In 1987, Cullen et al. reported a 24.0% overall positivity among women getting prenatal services in the Tohono O'odham Reservation Indian Health Service (IHS) clinics in Arizona [7]. All of these studies were conducted during the 1980s when screening for chlamydia was not routine or widespread. More recently, a national survey of young adults in the United States found a chlamydia prevalence of 13.3% among American Indian women, more than five times the prevalence among young white women [8].

Since 1995 and the implementation of the National Infertility Prevention Program, widespread screening for chlamydia has been conducted in family planning and other clinic settings, including IHS clinics across the United States [9]. However, there are limited data focusing on chlamydia in women screened in IHS clinics. Therefore, the purpose of this analysis was to examine the chlamydia positivity and characteristics associated with the risk of chlamydial infection among American Indian women screened in IHS clinics in 2003.

Methods

We analyzed data from 11,485 chlamydia tests performed from January 1, 2003 through December 31, 2003, on women aged 15 years and older seen in 23 IHS clinics that participated in the National Infertility Prevention Program in Montana (9 clinics, 4,187 tests), North Dakota (6 clinics, 2,242 tests), and South Dakota (8 clinics, 5,056 tests). The IHS clinics provide comprehensive community health care services. As part of routine care, all women seen in these clinics were screened for chlamydia. Over 96% of the chlamydia tests performed were Gen-Probe Transcription Mediated Amplified DNA assays (Gen-Probe, San Diego, CA). The majority of tests performed, 80.6%, were on cervical specimens, 12.1% on urine specimens, and 7.2% on vaginal specimens.

For each state, we calculated chlamydia positivity as the number of positive chlamydia test results divided by the total number of test results that were either positive or negative. Chlamydia positivity was calculated for five age groups (15–19 years, 20–24 years, 25–29 years, 30–34 years, ≥ 35 years) in each state. For Montana, the only state for which data were available on self-reported sexual risk behaviors and clinical findings, we calculated chlamydia positivity by: (1) whether the woman reported having had a positive chlamydia test in the prior 12 months; (2) self-reported sexual risk behaviors including whether the woman reported having had new or

multiple sex partners in the 90 days prior to the visit; and, (3) physical examination findings including the presence of cervical friability, mucopus, or the diagnosis of pelvic inflammatory disease. We used logistic regression to model the risk of a positive chlamydia test controlling for each of these factors: age, positive chlamydia test in prior 12 months, self-reported sexual risk behaviors, and clinical findings. The estimates from the model were used to calculate prevalence odds ratios and 95% confidence intervals (CI).

To examine potential disparities in chlamydia positivity among American Indian women versus white women, we compared chlamydia positivity among women aged 15–24 years screened in IHS clinics with the positivity among women in the same age group screened in family planning clinics that also participated in the National Infertility Prevention Program in the three states. All women under the age of 25 years were screened for chlamydia in the family planning clinics. The women screened in the IHS clinics were predominantly American Indian, while 90% or more of the women screened in the family planning clinics were white. The family planning data were based on 8,135 tests done in 20 family planning clinics in Montana, 4,699 tests done in 8 family planning clinics in North Dakota, and 2,584 tests done in 11 family planning clinics in South Dakota in 2003. Over 96% of the tests performed in the family planning clinics were Gen-Probe Transcription Mediated Amplified DNA assays (Gen-Probe, San Diego, CA).

Results

Overall, the chlamydia positivity among the 23 IHS clinics was 8.5% (7.2% in Montana, 10.6% in South Dakota, and 8.5% in North Dakota, data not shown). Chlamydia positivity was highest among 15–19 year old women, specifically, 15.3% in Montana, 18.6% in North Dakota, and 17.6% in South Dakota. (Fig. 1) While chlamydia positivity decreased with age in each state, positivity remained high among 20–24 year old women (state range 9.5%–12.0%) and continued to be greater than 3% even among women aged 30–34 years. Chlamydia positivity was lowest among women aged 35 years and older (state range 1.0%–2.6%).

In Montana, the risk of having a positive test for chlamydia was strongly associated with age <25 years but was not associated with a positive test for chlamydia in the last 12 months or the presence of abnormal clinical findings (Table 1). The risk of a positive chlamydia test was only slightly higher for women who reported having had one or more sexual risk behaviors compared to those who did not. Chlamydia positivity was consistently high among the groups of women screened in the Montana IHS clinics who

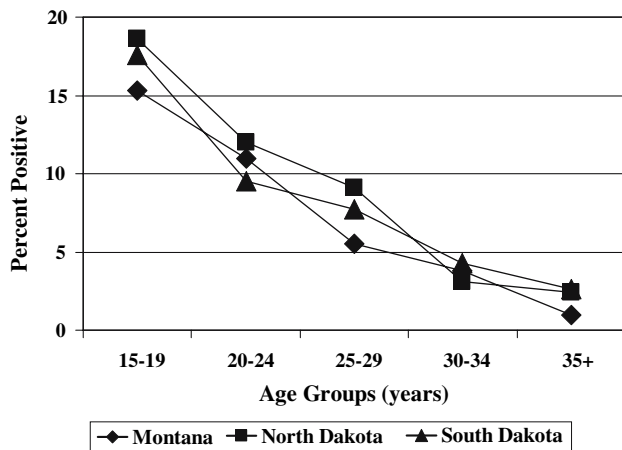


Fig. 1 Chlamydia positivity by age group and state, Indian Health Service Clinics, 2003

Table 1 Chlamydia positivity by characteristics of women screened in Indian Health Service Clinics, Montana, 2003

Characteristic	Chlamydia tests		Chlamydia positivity (%)	Prevalence odds ratio ^a (95% confidence interval)
	No.	Percent		
Age (in years)				
15–19	927	22.1	15.3	17.9 (10.1, 31.9)
20–24	865	20.7	11.0	12.3 (6.8, 22.2)
25–29	620	14.8	5.5	5.8 (3.0, 11.0)
30–34	447	10.7	3.8	4.0 (1.9, 8.3)
≥35	1,328	31.7	1.0	1.0 (Reference)
Positive chlamydia test in last 12 months				
No	4,117	98.3	7.1	1.0 (Reference)
Yes	70	1.7	11.4	1.1 (0.5, 2.4)
Number of self-reported sexual risk behaviors^b				
None	3,801	90.8	6.7	1.0 (Reference)
1 or more	386	9.2	12.2	1.7 (1.2, 2.4)
Number of clinical findings^c				
None	4,006	95.7	7.2	1.0 (Reference)
1 or more	181	3.7	7.2	0.8 (0.4, 1.4)

^a Based on a logistic regression model that included age group (15–19 years, 20–24 years, 25–29 years, 30–34 years, ≥35 years), having had a positive chlamydia test in last 12 months, one or more self-reported sexual risk behaviors in past 90 days, and one or more clinical findings on physical examination

^b Includes having had new or multiple sex partners in the last 90 days

^c Includes friable cervix, mucopus, or pelvic inflammatory disease

did not have these risk factors. Specifically, chlamydia positivity was 7.1% among the 98% of women who did not report a positive test for chlamydia in the last 12 months, 6.7% among the 91% of women who did not report having had any new or multiple sex partners in the last 90 days, and 7.2% among the 96% of the women did not present with any clinical findings (friable cervix, mucopus, or pelvic inflammatory disease) on examination.

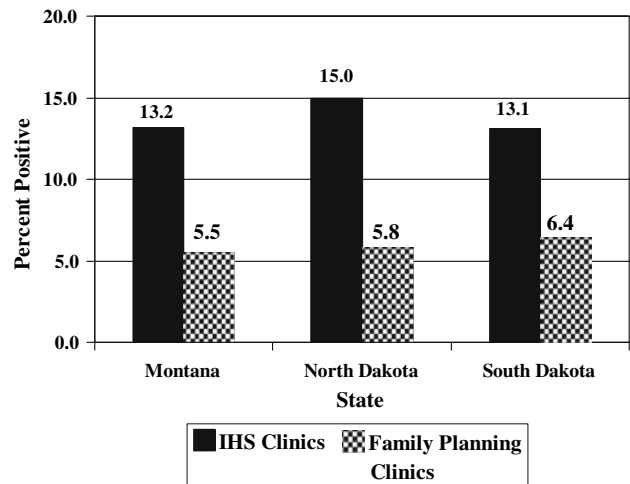


Fig. 2 Chlamydia positivity in women aged 15–24 years screened in Indian Health Service Clinics versus Family Planning Clinics by state, 2003

The chlamydia positivity among women aged 15–24 years screened in Indian Health Service clinics in 2003 was consistently at least twice as high as the positivity among women aged 15–24 years screened in family planning clinics in each state (Fig. 2). The positivity among women screened in IHS clinics versus family planning clinics was 13.2% versus 5.5% in Montana, 15.0% versus 5.8% in North Dakota, and 13.1% versus 6.4% in South Dakota.

Discussion

Women aged 15–19 years who were screened in Indian Health Service clinics in Montana, North Dakota, and South Dakota in 2003 had the highest chlamydia positivity among all women screened in those clinics (state range 15.3%–18.6%). Although chlamydia positivity decreased with age, the positivity was 9.5% and higher in women aged 20–24 years, and consistently 3% or higher even among women aged 30–34 years.

Data on chlamydia screening collected by the Indian Health Service did not include personal identifiers; therefore repeat tests for women during the year could not be identified. Consequently, positivity was calculated and used to monitor chlamydia prevalence. A previous comparison of positivity and prevalence found that chlamydia positivity was slightly higher than prevalence in family planning clinics and slightly lower than prevalence in sexually transmitted disease clinics [10]. However, the absolute difference between positivity and prevalence in these clinics was less than 0.5%. The high chlamydia positivity found in this analysis is consistent with the high prevalence among American Indian women documented in

a recent national survey [8]. Thus, it is unlikely that estimating positivity rather than prevalence could have accounted for the high burden of chlamydial infections in these clinics.

Clinic screening coverage among women, i.e., the proportion of women seen at the clinics and who received a chlamydia test during a calendar year, could have affected chlamydia positivity. The Centers for Disease Control and Prevention and the U.S. Preventive Service Task Force recommend that women aged 24 years and younger be routinely screened for chlamydial infection at least annually [11, 12]. However, if screening coverage was low in this group and only women with a higher risk of chlamydia were screened, chlamydia positivity could have been overestimated. Similarly, if women aged 25 years and older were screened only if they had known risk factors for chlamydia, positivity among these women could also have been overestimated. On the other hand, the fact that almost 32% of the tests performed were for women aged 35 years and older is consistent with information from clinic staff that all sexually active women who presented for care were screened for chlamydia. The low chlamydia positivity found in tests done among these older women suggests that universal screening is not appropriate in this low risk group, and those screening resources might be better redirected to women at higher risk.

The risk factors for chlamydial infection among women screened in IHS clinics were consistent with those found in family planning clinics, namely young age and having had a new sex partner or multiple sex partners in the past 90 days (13–16). However, chlamydia positivity was still 6.7% or higher among the women screened in IHS clinics and who reported no sexual risk behaviors or had no documented clinical findings.

Although chlamydia in women is a widely distributed STD among all racial and ethnic groups [2], our analysis documented disparities in chlamydia positivity among American Indian women screened in IHS clinics compared to white women screened in family planning clinics in the three states. This disparity in chlamydia positivity has been consistently demonstrated in family planning clinics in Health and Human Services Region X where higher chlamydia positivity has been found among minorities, including American Indians, when compared with whites [2]. A 2000–2001 national survey of young adults aged 18–26 years also documented higher chlamydia prevalence among minorities; the prevalence among American Indian women was 13.3%, exceeded only by the prevalence of 14% among black women. The chlamydia prevalence among American Indian women was five times greater than the prevalence among white women [8].

The very high chlamydia positivity documented repeatedly among young American Indian women

represents an unacceptable burden of infection in this community. Data from the 1999–2003 National Health Interview Survey demonstrated that the American Indian community faces many health challenges [17]. Within this context, further research is needed to develop culturally sensitive collaborative approaches to health care services, especially for young American Indian women. Because of the asymptomatic nature of the disease and the important reproductive health consequences, an evaluation of chlamydia screening, treatment, and intervention activities in the American Indian community should be an important component of any program whose goal is to improve the reproductive health of American Indian women.

Acknowledgements The authors would like to thank the following people for their help with the collection of the data from the Indian Health Service clinics and their review of this manuscript: Yvonne Hamby, JSI Research and Training Institute, Denver, CO; Laurie Kops and Susanne Zanto, Montana Department of Public Health, Helena, MT; Kirby Kruger, North Dakota Department of Health, Bismarck, ND; and Dave Morgan, South Dakota Department of Health, Pierre, SD.

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