Syphilis Screening in Primary Care

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Background. Reported cases of early syphilis have increased dramatically since 1987. Screening high-risk patients has been advocated as an intervention strategy to control the syphilis epidemic.

Methods. This study determined the prevalence of previously unrecognized positive syphilis serologies among patients at an urgent care center. Two hundred sixty-five patients treated empirically for gonorrhea were screened.

Results. Two patients had positive serology; both were previously treated for syphilis and had no evidence of recurrent infection. The yield from screening the study population was 0.

Conclusions. Serologic diagnosis of syphilis is not reliable or cost effective in groups with a very low prevalence of disease. Routine screening for syphilis in asymptomatic high-risk patients may not be indicated in all primary care settings.

Key words. Syphilis; sexually transmitted diseases; primary health care. *J Fam Pract 1991; 33:61-64.*

After 5 years of gradual decline, the incidence of primary and secondary syphilis in the United States increased 23% in the first quarter of 1987.[1] The greatest numerical increases occurred in Florida, California, and New York City, primarily among urban dwellers, heterosexuals, women, blacks, and Hispanics. Concerns that this trend would be followed by nationwide increases in congenital syphilis and ulcer-enhanced transmission of HIV infection have led the Centers for Disease Control (CDC) to recommend screening for syphilis in high-risk populations.[2] The 1989 Sexually Transmitted Disease Treatment Guidelines from the CDC suggest that all patients infected with a venereal disease should have serologic testing for syphilis.[3]

Despite current efforts, rates of primary, secondary, and congenital syphilis have continued to increase.[4] Large racial and regional differences in incidence rates suggest that there are populations that should be targeted for epidemic control.[5] Recent data suggest, however, that the standard practice of interviewing patients with syphilis and notifying their sexual partners may not be effective among social groups in which anonymous sexual encounters are common.[6] The benefits of screening high-risk patients for syphilis have not been clearly demonstrated in the primary care setting. The US Preventive Services Task Force[7] recommends routine serologic testing for prostitutes, persons with multiple sex partners in areas where syphilis is prevalent, and the sexual contacts of persons with active syphilis. The Task Force notes that there is sufficient evidence for this recommendation, but it does not cite any well-designed studies that support screening for syphilis in these groups. Testing for syphilis in patients with gonorrhea is not universally advocated and has been questioned in the absence of critical assessment.[8,9]

To assess the potential effectiveness of screening for asymptomatic syphilis in a high-risk population, it is necessary to know the prevalence of the disease in that group. Incidence rates published by health departments do not provide this information because they do not report the number of asymptomatic people screened or the presence of risk factors among infected individuals.

This study determined the prevalence of unrecognized positive syphilis serologies in a group of high-risk patients at a primary care facility. Issues related to screening for syphilis in clinical practice are discussed.

Methods

Screening for asymptomatic syphilis was conducted in an urban urgent care center during the months of February and March in the years 1988, 1989, and 1990. The facility is open 13 hours daily and is staffed by residents and faculty from the Department of Family Medicine at the State University of New York at Buffalo. The center

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Table 1. Indications for Treatment and Culture Results of Patients Treated Empirically for Gonorrhea

Indications for Treatment	Number of Patients Treated for Gonorrhea	Number of Patients with Positive Gonorrhea Culture (%)
Urethritis	162	60 (37)
Cervicitis	63	13 (21)
Pelvic inflammatory disease	81	18 (22)
Sexually transmitted disease contact	44	8 (18)
Total	350	99 (28)

provides episodic primary care to self-referred ambulatory patients from the local area. Ninety percent of the center's patients are black, the median age is 26 years, and three fourths have Medicaid or no health insurance. The incidence of early syphilis in Erie County was 5/100,000 in 1988, 11/100,000 in 1989, and increased to a projected rate of 18/100,000 in 1990 (health notice, April 6, 1990, from Ralph S. Citron, DDS, acting commissioner, Erie County Health Department). National rates were 16/100,000 in 1988 and 18/100,000 in 1989.[4]

The research proposal was approved by the institutional review board. During the study period, the nursing staff was requested to obtain syphilis serology on all patients for whom the physician ordered ceftriaxone or ampicillin-probenecid as treatment for presumptive gonorrhea. These patients constitute the high-risk group for surveillance in this study. Clinical charts from the study months were reviewed to check compliance with the screening protocol. The decision to treat the patient was based on historical or clinical evidence suggesting gonorrhea. Most patients also received treatment for chlamydia. Syphilis serologies were performed by standard methods at a reference laboratory. The rapid plasma reagin (RPR) test was used for screening. The titer from the RPR test and the result of the confirmatory fluorescent treponemal antibody absorption (FTA-ABS) test were recorded in a confidential logbook. All patients with positive serologies returned to be interviewed regarding any previous treatment they had received and any symptoms of syphilis infection that they had experienced. Patients who had positive RPR and FTA-ABS tests were considered to have asymptomatic syphilis unless their clinical assessments suggested another explanation.

Results

A total of 350 patients were treated for presumptive gonorrhea during the months of surveillance, representing 5% of all facility visits. The clinical indications for treatment are shown in Table 1. The number of patients treated for gonorrhea and screened for syphilis increased annually (Table 2). Of the 350 patients treated, serology results were available for only 265. Eighty-five patients were excluded because: the wrong serologic test had been requested (one patient); the patient had refused screening (three patients); the patient's blood specimen was not received in the laboratory (six patients); the patient was treated with spectinomycin (three patients); or no blood was drawn for serologic screening owing to an oversight (72 patients).

Table 2. Patients Treated Empirically for Gonorrhea, by Year

	1988 No. (%)	1989 No. (%)	1990 No. (%)	Total No. (%)
Treated for gonorrhea	88	107	155	350
Positive gonorrhea culture	18 (20)	45 (42)	36 (23)	99 (28)
Screened for syphilis	67 (76)	88 (82)	110 (71)	265 (76)
Positive syphilis serologies	1	0	1	2

There were no significant differences between the demographic characteristics of patients with and without serologic screening (Table 3). Only two patients had a positive RPR, and each had a positive confirmatory FTA-ABS test. Both patients were interviewed regarding previous diagnosis and treatment of syphilis and recent genital or skin lesions. Each admitted to previous treatment for syphilis but denied signs suggestive of recurrent disease. After clinical assessment, it was determined that neither patient had active syphilis infection. One was treated for cervicitis, and had an RPR titer positive at 1:2

Table 3. Demographics of Patients Treated Empirically for Gonorrhea

Characteristic	Patients Screened for Syphilis (n = 265) No. (%)	Patients Not Screened for Syphilis (n = 85) No. (%)
Sex		
Male	145 (55)	39 (46)
Female	120 (45)	46 (54)
Race		
Black	262 (99)	82 (97)
White	1 (0)	1 (1)
Hispanic	2 (1)	2 (2)
Age (y)		
0–14	1 (0)	0 (0)
15–25	169 (64)	47 (55)
26–40	85 (32)	37 (44)
41–60	10 (4)	1 (1)
Insurance		
Medicaid	142 (54)	46 (54)
Other	56 (21)	13 (15)
None	67 (25)	26 (31)

dilutions and a negative gonorrhea culture. The second case was a 57-year-old man with diabetes mellitus who had gonococcal urethritis and an RPR titer positive at 1:16 dilutions. Personnel at the Erie County Health Department who knew this patient reported that he had had congenital syphilis and had been treated with penicillin at least twice. His post-treatment RPR titers had remained positive at 1:4 dilutions. The observed two-dilution increase in his RPP titer may have been due to asymptomatic persistent or recurrent syphilis infection, although this could not be confirmed. Alternatively, the fluctuation in titer may have been due to a nonsyphilitic process or to variation in laboratory interpretation. If asymptomatic infection was present in this patient, the prevalence of syphilis in the screened population would have been 0.4% (95% confidence interval 0% to 1.1%).

Discussion

To control the current syphilis epidemic, a multifaceted approach that includes identification and treatment of active cases is suggested by the CDC. Because the diagnosis of syphilis by clinical signs, culture, and conventional light microscopy is difficult, serology is often used to establish infection. Among the many serologic tests available, the RPR test and FTA-ABS test are the most widely employed. Because of its cost, the FTA-ABS test is reserved as a confirmatory test for patients with a positive RPR test. The RPR test and FTA-ABS test are accepted as excellent diagnostic tools when used in a high-risk population, but the sensitivity and specificity of these tests are not perfect. Biologic causes of a false-positive result in the FTA-ABS and RPR tests include autoimmune disease, other infections, narcotics addiction, pregnancy, and old age. False-negative results may occur because of immunodeficiency states or premature testing in the presence of incubating syphilis.[10]

A screening RPR test will miss 20% of primary-stage and 9% of secondary-stage syphilis infections.[11] The greater sensitivity of the FTA-ABS test does not improve detection when the tests are used serially. The specificities of the RPR test and FTA-ABS test are 99% and 96%, respectively.[11] The positive predictive value of accurately diagnosing syphilis when both serologic tests are positive can be calculated when the disease prevalence is known. In a population in which the prevalence of secondary syphilis is 0.15%, the positive predictive value is 77%. When low-risk groups are screened, the majority of reactive serologies are due to false-positive results. Laboratory error, borderline results, and titer interpretation represent additional problems for clinical screening programs.[11–13]

When screening asymptomatic groups for syphilis, many of the resulting positive serologies are from those patients who have previously been identified and treated.[14] As few as 5% of patients with a mixed risk profile and positive serologies have active syphilis infection.[15] Many asymptomatic patients with positive serology have received antibiotics for an unrelated illness that inadvertently treated unrecognized syphilis.[16] An analysis of the cost-effectiveness of premarital syphilis screening found that the direct costs of testing are equal to the economic benefits from diagnosis when the prevalence of disease is 0.71% in the population.[17] It is more efficient to test patients for asymptomatic infection when they present for care related to a high-risk behavior (case-finding). By eliminating charges for office visits, case-finding becomes cost-effective when the disease prevalence is above 0.15%.

The yield from syphilis screening will be greatly affected by regional variance in disease prevalence. Individual state incidence rates range from less than 1/100,000 to 60/100,000,[4] yet these figures do not indicate the true differences between communities. Local disease rates should be monitored periodically so that screening practices can respond to changes in epidemiology. In some areas, testing all patients may be justified. In other areas, screening might be limited to surveillance of STD clinic populations. Symptoms of syphilis should be elicited from all patients infected with a sexually transmitted disease. A low threshold for testing is appropriate, but routine syphilis screening appears not to be cost-effective in groups where the prevalence of disease is less than 0.15%. At this prevalence, most positive serologies will be produced by biologic false-positive results, laboratory error, or detection of inactive disease. Case-finding in groups where the prevalence of active syphilis exceeds 0.15% appears to be justified, although a high proportion of those patients found to be positive by both serologic tests may have inactive disease.

A county's incidence of syphilis may be used by clinicians to guide screening practices. In counties where the incidence of early syphilis is below 10/100,000 population, index case tracking and screening at county STD clinics should be effective. In these low-risk areas, primary care physicians may seek evidence of other factors, such as anonymous sexual encounters or alkaloid cocaine abuse, before screening all STD patients for asymptomatic syphilis. In counties where the incidence of syphilis is high, the CDC recommendations for screening should be followed.

The prevalence of active syphilis infection in the study population is consistent with reports (0% to 0.2%) from surveillance of patients infected with gonorrhea.[18,19] The ability of this study to determine the true

prevalence of asymptomatic syphilis was limited by its small sample size. Disease rates in this group of patients who were treated for presumptive gonorrhea may differ from disease rates in groups in which gonorrhea infection has been documented. The implications for screening effectiveness may not be generalized to private practice or STD clinics if the prevalence of syphilis is different in those sites.

Conclusions

Surveillance of syphilis screening was conducted at a primary care facility in an area with a low incidence of disease. In our high-risk population, the prevalence of active syphilis is near 0%. Routine screening for syphilis in patients treated empirically for gonorrhea may not be indicated in all geographic and clinical settings.

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