A Study of 'Routine' Gonorrhea Cultures in a Family Practice

Christopher Krogh, MD, MPH, and Joseph Van Kirk, MD
Cheyenne, Wyoming, and Cold Spring, Minnesota

A varying, but significant, incidence of "asymptomatic" gonorrhea in women has been reported by numerous investigators and is one rationale for collecting specimens during pelvic examinations for screening gonorrhea cultures. There is a lack of research evidence, however, to document the value of such cultures in all settings.

In this retrospective study of gonorrhea cultures in a family practice, all of the cultures performed in one year were reviewed. Of the 219 clinically asymptomatic women who had screening cultures ordered, only two (0.9 percent) had culture-positive results, and both were known to be recent contacts of men with confirmed gonorrhea and hence would have had a screening culture ordered anyway. This finding opens to serious question the value of routinely screening women for gonorrhea by culturing vaginal specimens in all circumstances and suggests that thorough history and examination alone, supplemented by cultures only when clinically indicated, would suffice in certain settings.

The existence of significant pools of "asymptomatic" gonorrhea in women has been widely accepted, with the attendant result that routine gonorrhea screening is widely performed and is actually required in certain federally funded clinics. Screening is justified on the basis of cost and morbidity of the disease, the related perinatal mortality and morbidity, the observation that numerous contacts of known cases escape treatment, and the assumption that asymptomatic women are unlikely to be cultured in the absence of a screening program. The research evidence supporting routine screening, however, has been inconsistent.

In 1972 Pariser[1] described a pioneering Norfolk Health Department study of 250,000 gonorrhea cultures of specimens taken from women, "most of whom were unaware of their disease." Although he concluded that 90 percent of the positive cultures reflected "asymptomatic gonorrhea," he unfortunately provided no data to support this conclusion. This study is often cited as having established the existence of large pools of asymptomatic gonorrhea.

Submitted, revised, March 20, 1987.

From the University of Wyoming, School of Human Medicine, Family Practice Residency Program at Cheyenne, Wyoming, and the Cold Spring Medical Clinic, Cold Spring, Montana. Requests for reprints should be addressed to Dr. Christopher Krogh, Family Practice Residency Program, 821 East 18th Street, Cheyenne, WY 82001.

Zackler et al[2] suggested that, because far more men than women are treated for gonorrhea, and because "the majority of men acquire gonorrhea through heterosexual contact, these figures tend to substantiate the belief that there exists a large infectious pool of female carriers." On this questionable theoretical basis, they recommended and implemented the largest routine mass-screening program in the country.

Other authors attempted to document the number of patients who may be identified through screening cultures alone. Hein et al[3] reported that 7 percent of a series of 374 asymptomatic girls had test results that were culture positive. McCormack et al[4] reported 19 percent positive gonorrhea cultures of specimens taken from "asymptomatic" women who had presented to Boston City Hospital Clinics. Raba[5] reported positive cultures in 5.2 percent of 737 "asymptomatic" inmates of the Cook County Jail.

Whether such studies truly reflect unsuspected gonorrhea detectable only by culture, however, is open to question. The subjects of Hein et al[3] were a self-selected group of New York City detention center adolescents who had volunteered to undergo genital, rectal, and oral cultures. The population studied by McCormack et al[4] included a high proportion with known gonorrhea contact. Raba[5] found that 32.1 percent of his series of Cook County inmates reporting no symptoms actually did have urethral discharge when examined. Such considerations have led Weisner and Thompson[6] to caution that "the term

© 1987 Appleton & Lange

TABLE 1. CHARACTERISTICS OF WOMEN IN THE STUDY

	No. (%)
Contraception	
Birth control pill	93 (42.5)
Tubal ligation	12 (5.5)
Intrauterine device	19 (8.7)
Diaphragm	10 (4.6)
None	85 (38.8)
Age (years)	
11–14	3 (1.4)
15–19	45 (20.5)
20–24	97 (44.3)
25–29	74 (33.8)
Known contact with gonorrhea	
Yes	6 (2.7)
No	213 (97.3)
Past venereal disease history	
None	197 (89.0)
Gonorrhea	12 (5.5)
Pelvic inflammatory disease	10 (4.6)
Race	
White	188 (85.8)
Black	24 (11.0)
Other	7 (3.2)

'asymptomatic' should not be used too literally, since most men and women have definite, even if mild, symptoms."

Several investigators have not found the high incidences of unsuspected gonorrhea reported above. Querido and Haspels[7] reviewed a series of patients who had abortions and found that only three asymptomatic women out of 1,021 were culture positive. They concluded that routine cultures were probably not justified in their population. McMillan and Pattman[8] reviewed the culture results of urethral specimens from 5,076 men attending a sexually transmitted disease clinic and found that only six cases would have been missed had cultures not been performed. Moreover, *Morbidity and Mortality Weekly Report*[9] in 1978 reviewed the results of gonorrhea screening for the previous six months. The results of over 925,000 cultures of specimens taken from both symptomatic and asymptomatic women from private physicians' offices showed only 1.8 percent positive cultures, or less than the rate of positive cultures reported for asymptomatic patients alone in previously cited studies. Such findings led McCormack et al[4] to speculate that, except in women with recent contact, "the widely held concept that most gonococcal infections in women are asymptomatic may be erroneous."

Several factors may explain the discrepancy in reported findings. *Asymptomatic* is a broad term that may include preclinical, subclinical, atypical, or partially treated infections. In addition, the patients in these studies vary widely in demographic characteristics, sexual activity, access to infected partners, and ability to identify signs of gonorrhea. The result, unfortunately, is that many physicians may feel obliged to do "routine screening" cultures because of studies done in situations very different from their own.

METHODS

The present study was devised to determine the efficacy of routine screening cultures in a specific family practice. The setting was the North Memorial Family Practice Clinic, a residency training clinic that serves the northwestern quadrant of Minneapolis. Its patient population is predominately young, female, and poor with 35.2 percent on welfare. Characteristics of the study population are displayed in Table 1. Because these characteristics suggest high risk for gonorrhea,[6] it was assumed that asymptomatic gonorrhea would be encountered here, if in any private practice. Clinic policy at the time of this study required that a sample be obtained for gonorrhea culture on every woman undergoing a pelvic examination.

The cultures performed on samples taken from all women aged under 30 years during a one-year study period were reviewed. Women aged less than 30 years were chosen because this age group includes the patients at highest risk for the disease.[6] Patients who had received antibiotics in the two weeks prior to having the gonorrhea screening test were excluded because of the possibility that the antibiotics would cause a false-negative culture. Each patient was included only once in the study.

Women were not considered asymptomatic if they had one or more symptoms suggesting gonorrhea. By consensus of all physicians in the clinic, the following presenting complaints were identified as suggestive of gonorrhea: abnormal vaginal bleeding, vaginal discharge noted as abnormal by the patient, dysuria, dyspareunia, and lower abdominal pain of unknown etiology with or without fever.

Contacts of individuals known to have gonorrhea were included in the study population. Because some patients were not open about their contact history, it was decided to include all contacts rather than selectively excluding just those who admitted to contact.

Cultures consisted of a single endocervical swab inoculated immediately onto Thayer-Martin medium. Cultures were placed in a candle jar and transported at the end of each day to the state health department laboratories. This type of culture was standard practice in the clinic, partly because the clinic is located in geographic proximity to the state laboratories, and partly because the cost of such cultures was minimal, lessening the likelihood that a patient would refuse culture for reasons of cost.

RESULTS

Two hundred nineteen women whose characteristics are displayed in Table 1 were included in the study. The majority of patients fell into the two highest risk age groups, 15 to 19 years and 20 to 24 years, as identified by Weisner and Thompson.[6] Two women, or 0.9 percent, had positive culture results. Both were known to be recent contacts of men with gonorrhea.

DISCUSSION

Screening has been defined as "a process of separating those individuals with high probability of disease from those with low probability of disease in a population of apparently normal individuals."[10] If this process can be accomplished through history and physical examination alone, then some of the considerable costs of "routine screening" gonorrhea cultures may be unnecessary.

The family practice clinic in this study serves a population that is, by traditional criteria, at high risk for gonorrhea. In patients identified as asymptomatic using the previously listed criteria, however, culture-proven gonorrhea was not identified except in two individuals who were known to have had recent contact with gonorrhea. Those criteria, therefore, might be used in preselecting patients who need not be cultured in this clinic. Ideally this initial set of criteria eventually will be revised and optimized for this particular setting.

Other investigators have suggested that certain high-risk women should probably receive cultures as a part of pelvic examination even in the absence of symptoms. Allard et al[11] have published a list of predictors of asymptomatic patients likely to have culture results positive for gonorrhea. These include women with known gonorrhea contact,[12] contacts of bisexual men,[13] women with scabies,[14] and individuals on the first visit following treatment for gonorrhea.[15] It is also likely that women who electively present to venereal disease clinics constitute a high-risk group deserving gonorrhea screening by culture on that basis alone.

In other cases, however, a history and physical examination may suffice for gonorrhea screening. At first glance, a history and physical examination might appear to be more expensive and time-consuming than a culture. A culture, however, is done only in conjunction with an examination (a speculum being required to gain access to the cervix) and not as a substitute for it. Moreover, in some cases a careful history offers clear advantages over a culture; intensive directed interviews, for example, may lead to identification of gonorrhea in children and other contacts who would not ordinarily be cultured in a screening program.[16]

The single Thayer-Martin culture, as used in this study, may not represent an optimal laboratory screening method. Handsfield et al[17] have compared the sensitivity of the Thayer-Martin medium and fluorescent antibody staining and report the culture to be the more sensitive. At best, however, the sensitivity of endocervical Thayer-Martin cultures appears to be somewhere between 71 and 90 percent.[18] Several authors have suggested routinely culturing the rectum as well as the cervix in that 3 percent[2] to 20 percent[19] of cases may be diagnosed on the basis of a rectal culture despite a negative cervical culture,[18] but this practice may increase the cost by three to ten times per case detected.[20] Culturing of throats[21] and of tampons[22] has also been suggested. Several alternative tests for gonorrhea, such as the Gonozyme immunoassay, are now also available, and such tests may prove to be the most cost-effective and sensitive approach to gonorrhea screening.

Hart[10] has pointed out the distinction between mass screening of entire populations or subgroups and individual screening, usually involving patients who have actively sought medical care. He stresses the danger in trying to extrapolate from individual patients, who may be a skewed and self-selected group, to the general population.

A study such as this, done in a private clinic, may therefore have limited relevance to other settings. It does suggest, however, that routine cultures of all patients may not add to the number of cases identified clinically in all settings.

The costs of gonorrhea screening cultures are tremendous given that over 2 million cultures are performed in private practices each year.[9] Until other diagnostic tests become widely available, further study in a variety of settings is clearly justified to determine whether, in fact, some hundreds of thousands of routine gonorrhea cultures each year may be unnecessary.

References

1. Pariser H: Asymptomatic gonorrhea. Med Clin North Am 1972; 56:1127–1132
2. Zackler J, Orbach H, Brolnitsky O, Brown MC: A mass screening program for the detection of gonorrhea. Am J Obstet Gynecol 1982; 112:772–776
3. Hein K, Marks A, Cohen MI: Asymptomatic gonorrhea: Prevalence in a population of urban adolescents. J Pediatr 1977; 90:634–635
4. McCormack WM, Johnson K, Stumacher RJ, et al: Clinical spectrum of gonococcal infection in women. Lancet 1977; 1:1182–1185
5. Raba J: Asymptomatic gonorrhea. JAMA 1981; 245:2395
6. Weisner PJ, Thompson SE: Gonococcal disease. DM 1980; 24:1

7. Querido L, Haspels AA: The incidence of gonorrhea in an abortion population. Contraception 1980; 22:441–444
8. McMillan A, Pattman RS: Evaluation of urethral culture for Neisseria gonorrhoeae in the routine investigation of men attending a STD clinic. Br J Vener Dis 1979; 55:271–273
9. Center for Disease Control: Results of screening for gonorrhea. MMWR 1978; 27:448
10. Hart G: Screening to control infectious diseases: Evaluation of control programs for gonorrhea and syphilis. Rev Infect Dis 1980; 2:701–711
11. Allard R, Robert J, Turgeon P, Lepage Y: Predictors of asymptomatic gonorrhea among patients seen by private practitioners. Can Med Assoc J 1985; 133:1135–1139, 1146
12. Potterat JJ, King RD: A new approach to gonorrhea control. The asymptomatic man and incidence reduction. JAMA 1981; 245: 578–580
13. Austin TW, Lent B, Pattison FL: Gonorrhea in homosexual men. Can Med Assoc J 1978; 119:731–732
14. Nielsen AO, Scher L, Seier K: Gonorrhea in patients with scabies. Br J Vener Dis 1976; 52:394–395
15. Volkin LB, Thompson DS, Sheperd GG: Epidemiologic follow-up study of patients with gonococcal pelvic inflammatory disease. Sex Transm Dis 1979; 6:267–269
16. Phillips L, Potterat JJ, Rothenberg RB, et al: Focused interviewing in gonorrhea control. Am J Public Health 1980; 70:705–708
17. Handsfield HH, Lipman TO, Harnisch JP, et al: Asymptomatic gonorrhea in men. N Engl J Med 1974; 290:117–123
18. Caldwell JG, Price EV, Pazin GJ, Cornelius CE: Sensitivity and reproducibility of Thayer-Martin culture medium in diagnosing gonorrhea in women. Am J Obstet Gynecol 1975; 18:233–241
19. Pariser H, Marino A: Analysis of a recent epidemic due to penicillinase–producing gonorrhea: Epidemiologic and medical considerations. Sex Transm Dis 1982; 9:132–134
20. Keith L, Moss W, Berger GS: Gonorrhea detection in a family planning clinic: A cost benefit analysis of 2000 triplicate cultures. Am J Obstet Gynecol 1975; 121:399–404
21. Osborne NG, Grubin L: Colonization of the pharynx with Neisseria gonorrhoeae: Experience in a clinic for sexually transmitted diseases. Sex Transm Dis 1979; 6:253–256
22. Haughie GE, Ames WR, Madsen EF: The use of tampons for identifying asymptomatic N gonorrhoeae infections. J Am Vener Dis Assoc 1975; 2:26–28