

Evaluation of urethral culture for *Neisseria gonorrhoeae* in the routine investigation of men attending a STD clinic

ALEXANDER McMILLAN AND RICHARD S. PATTMAN

From the Department of Sexually Transmitted Diseases, Black Street, Glasgow

SUMMARY Urethral gonorrhoea was diagnosed by culture in 957 (18·8%) of 5076 new male patients attending a sexually transmitted diseases clinic; the infection was asymptomatic in 38 (4%) of these patients. The diagnosis in only six (0·3%) out of 2159 men with urethral gonorrhoea but with no symptoms or signs of urethritis would have been missed if urethral cultures had not been performed.

Introduction

Urethral gonorrhoea in men usually produces symptoms of urethral discharge and dysuria of varying severity. About 15% of men with urethral infection, however, have no symptoms and constitute an important reservoir of infection (Moore *et al.*, 1973; Portnoy *et al.*, 1974; Nielsen *et al.*, 1975).

We decided to examine the value of urethral culture as part of the investigation of all men attending a sexually transmitted diseases clinic.

Materials and methods

All men attending this department between 1 January 1977 and 31 March 1978 were investigated. During this period 5076 new male patients attended.

A careful history was taken from each patient, particular attention being paid to the presence and duration of urethral discharge and dysuria and to whether or not the patient was a sexual contact of another patient with gonorrhoea. The duration of infection was determined from the sexual history of the patient and of his sexual partner.

The urethral meatus was inspected after gentle massage of the penile urethra from the bulb forwards, and a Gram-stained smear of any exudate was examined microscopically. Smears were only prepared if a discharge was present or if the patient was a sexual contact of an infected partner.

Address for reprints: Dr A. McMillan, Department of Sexually Transmitted Diseases, 67 Black Street, Glasgow G4 0EF

Received for publication 20 December 1978

In every case material from the urethra was cultured for *Neisseria gonorrhoeae*. Specimens were taken using charcoal-impregnated bacteriological swabs and sent to the laboratory in Stuart's transport medium. The culture medium used was Columbia blood agar (Oxoid) containing vancomycin (2·5 µg/ml), trimethoprim (3·0 µg/ml), and polymyxin (15 units/ml). The identity of suspected colonies of *N. gonorrhoeae* was confirmed by the oxidase test and sugar utilisation reactions.

After specimens had been taken for bacteriological investigation, the urine was examined macroscopically by the two-glass urine test. The presence of haze, specks, or threads in the urine was noted, as was the period during which the patient had not passed urine before attending the clinic.

Results

Urethral gonorrhoea, as diagnosed by culture, was found in 957 (18·9%) of 5076 men.

The results of Gram-stained smears of exudate from 2903 men with urethral discharge are given in the Table. Urethral gonorrhoea was diagnosed by microscopy and culture in 875 (94·1%) men and by culture alone in 55. Gram-negative diplococci, morphologically resembling the gonococcus, were observed in smears from 67 men; *N. gonorrhoeae* was not, however, isolated on culture. Eleven of these infected men had no symptoms of urethritis, but discharge was noted on examination.

Microscopical examination of urethral material showed presumptive gonococci in 10 of 14 other culture-positive men who were named contacts and had no symptoms or signs of urethritis.

The other 13 patients found to have urethral gonorrhoea had no symptoms of urethritis and no obvious urethral discharge was noted on examination, although most had passed urine within the preceding two hours (mean interval between the time of most recent micturition and that of examination was 95 minutes; range, 30 minutes to 4 hours). Threads, haze, or specks were detected in the urine of seven of these men; microscopical examination of the threads or specks was not performed. These patients attended for treatment of some other condition, such as genital warts or balanoposthitis, and were not known contacts. Three of these 13 men attended during the prepatent period—two to four days (Mahoney, 1940)—of the infection. Of the remaining 10 men, the mean duration of infection was 64 days (range 15-300 days).

Table Results of examination of Gram-stained smear of exudate from patients with urethral discharge

Smear results	Culture for <i>N. gonorrhoeae</i>	
	Positive	Negative
Typical organisms		
Present	875	67
Absent	55	1906
Total	930	1973

In this series, the incidence of asymptomatic infection—that is, lack of symptoms of urethral discharge or dysuria or both—was 4% (38 of 957 men with gonorrhoea). If urethral culture had not been performed routinely on 2159 patients who had no symptoms or signs of urethritis and who were not named contacts, the diagnosis would have been missed in six (0.3%) infected men.

Discussion

Examination of a Gram-stained smear is only moderately sensitive in diagnosing urethral gonorrhoea in symptomatic patients; our finding of 94% sensitivity agreed broadly with that of Jacobs and Kraus (1975). Recent micturition reduces the likelihood of finding gonococci on a Gram-stained smear, although it does not interfere with cultural diagnosis (Judson *et al.*, 1977). This finding may partly explain the disparity between microscopy and culture results.

Failure to isolate *N. gonorrhoeae* from the urethra of 67 men in whom organisms morphologically resembling the gonococcus were observed in Gram-stained smears of exudate may be explained by the inability of the organisms to survive in Stuart's transport medium. Coliforms may grow in this medium and may inhibit growth of *N. gonorrhoeae*

(Amies, 1967). About 3% of gonococcal strains will not grow in medium containing 3 µg/ml of vancomycin (Reyn, 1969), and this may partly explain why the organism was not isolated in these men.

Microscopical examination of a Gram-stained smear is, however, a very insensitive means of detecting gonorrhoea in the absence of clinical signs of urethritis (Handsfield *et al.*, 1974), since culture of material from the urethra is required to establish a diagnosis. Handsfield *et al.* (1974) also demonstrated that culture of material from the anterior urethra was more sensitive than culture of prostatic fluid.

The importance of asymptomatic (that is, without symptoms of urethral discharge and dysuria) but infectious men with urethral gonorrhoea has previously been stressed (Blount, 1972), and most physicians are now aware of this when examining male contacts of infected individuals.

Although Thatcher *et al.*, (1969) found no case of urethral gonorrhoea among 505 military personnel undergoing routine medical examination, Handsfield *et al.* (1974) reported an incidence of asymptomatic infection of just under 1% in 2628 servicemen returning from south-east Asia.

There have, however, been few reports on the prevalence of asymptomatic urethral infection in the civilian population. Carpenter and Westfield (1940) found a prevalence of about 1% in sexually active male prisoners. In a small series, Pariser *et al.* (1964) reported a prevalence of 4% of men attending a venereal disease clinic of their own accord. John and Donald (1978) found that of 203 cases of urethral gonorrhoea 17% had no symptoms and that in 7% the symptoms were so mild as to be ignored by the patient. This contrasts with our finding of a prevalence of 4% in men.

In the present series, although 38 infected men were asymptomatic, 11 had a frank, urethral discharge, and culture would in any case have been performed, as it would have been in the 14 named but asymptomatic contacts. Finding threads or specks in the urine would normally have prompted further investigation, the patient being asked to return for investigation of an early morning smear. The value of this examination has recently been confirmed (Simmons, 1978). In only six infected men (0.3% of patients who had no symptoms or signs of urethritis and who were not named contacts) would the diagnosis have been missed if urethral culture had not been a routine investigation of all clinic patients.

Ideally, where laboratory facilities permit, urethral culture should be performed on each patient routinely; where facilities are limited it would, however, be difficult to justify the screening of every male patient.

References

- Amies, C. R. (1967). A modified formula for the preparation of Stuart's transport medium. *Canadian Journal of Public Health*, **58**, 296-300.
- Blount, J. H. (1972). A new approach for gonorrhoea epidemiology. *American Journal of Public Health*, **62**, 710-712.
- Carpenter, C. M., and Westphal, R. S. (1940). The problem of the gonococcus carrier. *American Journal of Public Health*, **30**, 537-541.
- Handsfield, H. H., Lipman, T. O., Harnisch, J. P., Tronca, E., and Holmes, K. K. (1974). Asymptomatic gonorrhoea in men. Diagnosis, natural course, prevalence and significance. *New England Journal of Medicine*, **290**, 117-123.
- Jacobs, N. F. and Kraus, S. J. (1975). Gonococcal and non-gonococcal urethritis in men: Clinical and laboratory differentiation. *Annals of Internal Medicine*, **82**, 7-13.
- John, J., and Donald, W. H. (1978). Asymptomatic urethral gonorrhoea in men. *British Journal of Venereal Diseases*, **54**, 322-323.
- Judson, F. N., Wright, R. A., and Mann, E. A. (1977). Recent micturition does not affect the detection of urethral gonorrhoea. *British Journal of Venereal Diseases*, **53**, 308-310.
- Mahoney, J. F. (1946). Experimental gonococcal urethritis in human volunteers. *American Journal of Syphilis, Gonorrhoea and Venereal Diseases*, **30**, 1-39.
- Moore, G., Pittard, W. B., Mosca, N., and O'Brien, W. (1973). Gonorrhoea detection by urine sediment culture. *Journal of the American Medical Association*, **224**, 1499-1501.
- Nielsen, R., Sondergaard, S., and Ullman, S. (1975). Asymptomatic male and female gonorrhoea. *Acta Dermato-venereologica (Stockholm)*, **55**, 499-501.
- Pariser, H., Farmer, A. D., and Marino, A. F. (1964). Asymptomatic gonorrhoea in the male. *Southern Medical Journal*, **57**, 688-690.
- Portnoy, J., Mendelson, J., Clecner, B., and Heisler, L. (1974). Asymptomatic gonorrhoea in the male. *Canadian Medical Association Journal*, **110**, 169-171.
- Reyn, A. (1969). Recent developments in the laboratory diagnosis of gonococcal infections. *Bulletin of the World Health Organisation*, **40**, 245-255.
- Simmons, P. D. (1978). Evaluation of the early morning smear investigation. *British Journal of Venereal Disease*, **54**, 128-129.
- Thatcher, R. W., McCraney, W. T., Kellogg, D. S., and Whaley, W. H. (1969). Asymptomatic gonorrhoea. *Journal of the American Medical Association*, **210**, 314-317.