FLUORESCENT GONOCOCCAL ANTIBODY TECHNIQUE IN GONORRHEA IN THE MALE

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THE fluorescent antibody (FA) techniques for the identification of bacteria (*1–5*) have recently attracted considerable attention. The delayed fluorescent gonococcal antibody test of Deacon and co-workers (*6*) appears to be outstanding in simplicity of performance and high specificity of results. This delayed FA procedure will probably find its greatest application in improving the laboratory diagnosis of asymptomatic gonorrhea in women. However, its potential application in the diagnosis of gonococcal urethritis in men, perhaps with particular reference to problem cases, should not be ignored. Since diagnosis both clinically and culturally is more reliable in men, we decided to conduct our initial investigation of the delayed FA technique on men.

Since any new laboratory test needs thorough evaluation under actual clinical conditions, we have compared the delayed fluorescent antibody technique with the standard plate culture method in 477 patients.

Method

Specimens selected at random from a number of patients with complaints related to the urethra and from a smaller group without evidence of urethritis were cultured by both the plate method (Difco gonorrhea medium base with Langford's enrichment supplement and nile blue sulfate) and the delayed slant method (Difco gonorrhea medium base with supplement B). The same urethral swab was used for both cultures. An agar plate was streaked first without rotating the swab; then the swab was rotated and placed on a slant and left in the tube. Slants were read using the delayed FA technique described by Deacon and employing fluorescein-tagged gonococcal antiserum prepared in Deacon's laboratory. A total of 477 patients was used in the comparative study. Sugar fermentations were carried out on half of the cultures that were in agreement and on all possible cultures that were not in agreement. Unfortunately, in a number of such instances the culture was overgrown with contaminants or too few colonies were present for isolation and study.

At the time of this study, Dr. Moore was a resident, department of dermatology, Baylor University Affiliated Hospitals, and Dr. VanderStoep was director of the social hygiene clinic, Houston City Health Department. Mr. Wende is director of the Houston City Health Department Laboratories, and Dr. Knox is associate professor, department of dermatology, Baylor University College of Medicine, Houston, Tex.

Results

In 441 (92.4 percent) of the 477 cultures there was clear agreement; 146 were negative in both tests and 295 were positive in both tests. In 36 (7.6 percent), results of the two tests disagreed (see table).

In 9 of the 36 cultures in which disagreement was found (1.9 percent of the total specimens) the plate culture was positive and the FA culture was negative. In two of these instances the swab inadvertently was buried in the medium; therefore, these cases possibly should have been excluded from the study. Sugar fermentations could not be done on five specimens because there were so few oxidase-positive colonies on the culture plate that technical difficulties prevented further study.

In the other four specimens the sugar fermentation definitely proved the presence of *Neisseria gonorrhoeae*. The clinical impression in all nine cases was gonorrheal urethritis.

There were 27 cultures (5.7 percent of the total specimens) in which the FA test was positive and the plate culture was negative. On six of these plate cultures there was no growth, and on two others the plate was overgrown with *Pseudomonas*. With the other 19 specimens it was not possible to demonstrate from the growth on the culture plate any presumptive evidence of gonorrhea, that is, oxidase-positive colonies of gram-negative diplococci.

Clinical data from these 27 FA positive, culture negative individuals revealed the following information:

1. Eleven patients had clinical gonorrhea. However, three of these had received penicillin therapy quite recently for their urethritis and may have had low penicillin blood levels at the time of culture.

2. Six patients were diagnosed clinically as having nongonococcal urethritis. On reexamination two of the six had classic purulent gonococcal urethritis and positive cultures. The remaining four were unchanged clinically, but two had positive cultures. All continued to have positive FA tests.

3. Four patients had nonsyphilitic genital lesions and no clinical evidence of urethritis. One had chancroid and three had herpes progenitalis. On return to the clinic, one of the patients with herpes had urethral discharge and positive culture. The other three (all on sulfonamide therapy) still had no discharge and negative cultures. One had become negative to the delayed FA test.

4. Four patients indicated recent exposure to a possibly infected woman but were asymptomatic at the time of examination. One patient had been treated 1 week earlier with tetracycline and complained of slight residual burning but had no urethral discharge. One patient was a clinically negative premarital examinee. These six patients were symptomatic with positive cultures within 48 hours after initial examination.

Agreement [1] between results of examination of 477 cultures by the delayed fluorescent gonococcal antibody test and by plate culture

FA test	Plate culture			
	Positive		Negative	
	Number	Percent	Number	Percent
Positive	295	61. 8	27	5. 7
Negative	9	1. 9	146	30. 6
Total	304	63. 7	173	36. 3

[1] 92.4 percent agreement, 7.6 percent disagreement.

Comments

The results of this study indicate that the delayed FA test for gonorrhea is equal in sensitivity if not superior to a carefully performed culture technique. The 92.5 percent agreement in the two methods is impressive. This study did demonstrate, as was to be expected, that an occasional test will be negative in a definite case of gonorrhea. The specificity of the tagged antiserum itself seems assured when produced and absorbed as described by the author of the procedure; however, the possibility of false positive reports must be considered. At this time we cannot be certain whether any of the FA positive but culture negative instances were false positives. This is an area that is receiving further clinical and laboratory study.

In most laboratories routine cultures are not carried through fermentation studies; therefore, final confirmation of results is not available. Fermentation studies are time consuming and expensive, and the FA test is both quicker and simpler than fermentations. However, presumptive cultural evidence (gram-negative diplococci that are oxidase positive) is adequate for routine diagnostic purposes. The delayed FA test is more time consuming than routine presumptive cultures because much time is required to examine the negative specimens under the fluorescence microscope. At present, we search the slide for at least 5 minutes before declaring that there are no fluorescent organisms. In actual practice we have often examined our negative slides for closer to 10 minutes than 5.

Apparently the FA tests have several areas of usefulness for diagnosing urethritis in men. Among these are the instances when a rapid, positive confirmation of a clinical diagnosis is required. Where speed is important, it could be possible with the direct technique to have an answer on the day of clinical examination and with the delayed technique by the next day. In the studies of Deacon and co-workers (*5*, *6*), the FA tests offered the same degree of specificity as cultures confirmed by sugar fermentations. The problem of gross contamination by other organisms is less troublesome with the FA technique because contaminants do not have to be taken into consideration. In addition, the apparently greater sensitivity of the delayed FA procedure, in comparison with usual culture methods, suggests its value in the diagnosis of nonspecific urethritis and in complications of gonorrhea, such as arthritis, conjunctivitis, and epididymitis. Some poorly understood areas of gonorrhea epidemiology, such as the likelihood of asymptomatic male carriers and length of time infectivity persists after treatment, might be clarified by employing this diagnostic technique. The asymptomatic woman is the greatest problem in the control of gonorrhea, and it is in the diagnosis of her disease that these tests will probably find their greatest usefulness.

Summary

The delayed fluorescent antibody test for gonorrhea was compared with a routine culture technique in 477 men. Men were selected because diagnosis, both clinically and culturally, is more accurate in men than in women. The results of the two tests were in agreement in 92.4 percent of the cases. In 5.7 percent the FA test was positive and the culture was negative; in 1.9 percent the culture was positive and the FA test negative.

This study indicates that the delayed FA test for gonorrhea will be a valuable addition to diagnostic tests available for the study of urethritis in men.

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