Venereal disease, as we define it, is any disease that is propagated or transmitted by sexual intercourse. Traditionally we have taught medical students that this included chancroid, lymphogranuloma venereum, granuloma inguinale, gonorrhea, and syphilis. Then we taught them enough to be able to match up Donovan bodies, Frei test, Thayer Martin media, and at that point we felt that we had pretty much done our job. If we are to stick to the criteria of diagnosis, I suggest we should also consider as venereal diseases, Trichomonas, incomplete abortions, septic abortions, ectopic pregnancy, unwanted pregnancy, crab lice, herpes simplex virus (type 2), and carcinoma of the cervix. There is considerable disparity among these conditions, but they all have one thing in common: they reflect sexual activity. Trichomonas, on the one hand, may represent sexual activity several years in the past. The trichomonad may lie asymptomatic in the female vagina or the male urethra only to become apparent weeks, months, or even years later. Squamous cell carcinoma, on the other hand, is more like a scoreboard of total sexual activity. Early intercourse, multiple partners, multiple pregnancies are all contributing factors in the development of carcinoma of the cervix. Cervicitis may lie somewhere in between these two extremes and indeed be somewhat related to both.

Currently, gonorrhea is enjoying the most popularity, both in the literature and in the population. We are unquestionably in the midst of an epidemic. Last year in the United States, there were probably two million cases of acute gonorrhea. We developed forty thousand cases a week. One person gets gonorrhea every 15 seconds; every week sixty-five boys returning from Viet Nam have the disease. Most of these are under treatment. More than 25% of patients with gonorrhea are less than 20 years of age; more than 50% of patients with gonorrhea are less than 29 years of age. We are finding that the incidence in the general population is much higher than previously supposed. Screening in OB and GYN clinics across the country have consistently come up with figures of between 5 and 10 percent incidence of gonorrhea in those screened. It can be safely said that one out of every ten girls between the ages of 15 and 25 years of age harbors the gonococcus.

The fact that we have had asymptomatic female carriers has been known for sometime. As a matter of fact, probably 75% to 80% of women with gonorrhea are totally asymptomatic. But they are still infectious. They can still spread the disease. We are just lately finding, much to our consternation, that there are asymptomatic male carriers as well.

In the city of Norfolk, the Public Health Department made a series of studies on male contacts of known female patients with gonorrhea. The result was a raw incidence of 12% positive cultures in asymptomatic men. If you corrected this by ruling out the patients from whom cultures had been taken during the incubation period, you would still have a figure of 6%. In one uncontrolled and unpublished series that was performed here by our Health Department, they found 22 positive cultures in asymptomatic men out of a group of 144 male contacts. I hasten to add that these 22 were not separated out as to whether or not they were in the incubation period. With this large number of asymptomatic patients in both the male and female patient population, the obviously pressing problems are to discover an adequate method of diagnosis and to treat these people.

The first culture technique for the diagnosis of gonorrhea was the use of chocolate agar. This is plated with pus from the urethra, or the cervix, or the anus, and then incubated under 10% of CO₂ at 37°C. With this classic type of culturing, sub-
culturing must be carried out as well as sugar fermentations. It is frequently ten days before the diagnosis can be made. Overgrowth is a problem, particularly with Proteus; since it may obliterate the gonococcal culture.

The next improvement in diagnostic method was the development of Thayer Martin media. This media initially was chocolate agar with the addition of antibiotics, ristocetin, and polymyxin. Lately it is referred to as the VCN plate which contains Vancomycin®, colistin, and nystatin for the suppression of the non-pathogenic bacteria and other contaminants such as staph, strep, and the gram negatives. Thayer Martin media obviously has its advantages, but its chief disadvantage is that in order to be effective it should be plated directly from the patient, and as a result, the specimen frequently loses viability on the way to the lab. Thayer Martin media also has one small drawback due to its inhibitive factor, so that in terms of speed, the gonococcus may take up to three days to grow out, whereas on chocolate agar it will frequently grow out in 24 hours.

Carrying media prepared by Stuart is a liquid in which the specimen can be immersed and shipped to the lab. It is a non-nutrient media, and some cultures are lost because of this, but it has the advantage of protecting the gonococcus from oxidation.

Transgro has recently been developed. This is a combination of a selective gonococcal media that is also a transport media. It is a modified Thayer Martin type media. It differs from the others in that it is put up in a one-ounce medicine bottle with a narrow neck. The media is layered on the side that it forms a flat plate on the inside of the bottle much like a blood culture bottle. Transgro contains an increased amount of agar to make the culture media more rigid for mailing, and it contains a higher concentration of sugar. The bottle has an atmosphere of 10% CO₂ under a rubber screw tip. It can be plated directly from the patient at the time of examination and held at room temperature until ready for mailing. It appears to be a very good media for office practice; however, I would use with caution any new technique, as laboratories will need time to get used to it.

In addition to culturing methods for diagnosing gonorrhea, the fluorescent antibody techniques have been developed. The direct method is done by plating the specimen on a glass slide, overlaying it with fluorescent antibody, and then looking at it under an ultraviolet microscope. The gonococcus will fluoresce. Unfortunately, this will not reproduce the results obtainable with ordinary culture. It is fast but its effectiveness is only in the range of 60%. The delayed fluorescent antibody technique is much better. It is done by first plating a chocolate agar slant, allowing the specimen to grow on the slant for 18 hours, and then removing the specimen to a slide. During this time, the gonococcus will multiply in such numbers that when it is visualized under an ultraviolet light microscope one has a much higher incidence of positive results. Thayer Martin media, Transgro, chocolate agar, and the delayed fluorescent antibody technique all have fairly comparable results of being positive in 75% to 80% of known cases.

Who should be cultured? I think that we should culture all prenatal patients because the incidence of gonorrheal ophthalmia in newborns is on the rise. In addition to prenatal patients, I am beginning to believe that we should also culture for gonorrhea everyone who is given a pack of birth control pills; the reason being that anyone needing contraception is obviously sexually active. And we should focus particular attention on the 15- to 25-year-olds seeking contraceptives, as they are the most susceptible group.

Gonorrhea is a serious medical problem. Too frequently we think of it as being a nuisance, but it is more than that. Eighty percent of women are asymptomatic, but we must remember that 10% will develop salpingitis, and 3% will be forever sterile from the disease. The largest cause of infertility in our patient population is unquestionably gonorrhea.

The treatment of choice remains penicillin, for the time being anyway. The minimum treatment for the female is 4.8 million units of procaine penicillin. I might interject here that in our practice, we have hospitalized all patients suspected of having salpingitis or those with systemic symptoms and treated them with high levels of aqueous penicillin, in addition to procaine penicillin. For years, much more modest doses of the drug gave good cure rates. I think the initial recommended dose of penicillin for gonorrhea by the Public Health Department was something like a single shot of 40 thousand units. Now, I am advocating 4.8 million units because of the biologic change in the gonococcus. In 1947, the minimum lethal concentration of penicillin was 0.004 units/ml; in 1957, 0.1 units/ml; in 1967, 1.0 units/ml. This indicates a two hundred and fifty-fold decrease in the sensitivity of the gonococcus to penicillin. You can see by this trend that the time is coming when we can no longer use penicillin, because the capacity of the female
buttock to receive procaine penicillin has been reached. Much of the current emphasis in research is on developing antibiotic alternatives for penicillin. Tetracycline is usually considered a second-line drug. Good results have also been achieved with kanamycin, chloramphenicol, and erythromycin. The combination of ampicillin and probenecid has been used with success, and I might add that probenecid, which decreases excretion of penicillin, may well be advised with the use of procaine penicillin. There is one study in Greenland using a combination of 5 million units of procaine penicillin and one gram of probenecid. With this they have shown that they are able to arrest the decreasing sensitivity of the gonococcus to penicillin.

Benzathine penicillin should never be used to treat gonorrhea. A series of patients given 1.2 million units of benzathine penicillin were checked 24 hours later for circulating penicillin. More than 50% had less than 0.1 unit/ml which is ten times less than the amount necessary to treat gonorrhea, and this may in fact have lead to the desensitization of the disease to the drug.

If gonorrhea is the prima donna of venereal diseases, the spectre lurking in the shadows is syphilis. We are not currently seeing a surge in the incidence of syphilis; however, last year the total number of cases did rise slightly although the rate of new cases did not. Three hundred babies born last year had congenital syphilis. Consider three hundred babies with smallpox, syphilis being the great pox. Two thousand people died last year of syphilis. There are five hundred thousand patients in this country with latent syphilis untreated or undertreated today. That syphilis is not showing the same current increase as gonorrhea is attributed by many to the fact that syphilis may be aborted by the treatment of gonorrhea. One series has attempted to prove that the current recommended dosage of procaine penicillin will abort an incubating syphilis infection. This series, begun in 1957, utilized as its criteria for the cure of syphilis, the fact that the patients were sero-negative and had no lesion of syphilis after three months. I think that we should be a bit cautious about predicting whether or not these patients are going to develop latent syphilis, and there are physiologic reasons for having doubts. We know that we can recover the spirochete from the anterior chamber of the eye and from the cerebrospinal fluid, and we also know that it is extremely difficult to get therapeutic levels of penicillin into these body fluids. A second physiologic fact that makes me question this evidence is that penicillin will kill a spirochete only when the spirochete is replicating. It replicates every 32 hours, but we can assume that every spirochete is not killed the first time. Procaine lasts 72 hours with good levels, so the use of relatively short-acting penicillin like procaine as opposed to the long-acting benzathine leaves one to wonder if all these syphilis infections are cured or if the presenting symptoms are merely delayed or aborted altogether with the possibility of latent syphilis developing.

There has been much speculation, but little has been proven, about the increase in the incidence of venereal disease. It is very easy to say, "Well, more people are doing more things more often than they have been in the past." But it is extremely difficult to prove. There is data to support this. Kinsey, in the 1940's, found that 20% of 20-year-old college women had had premarital intercourse. Vance Packard in the 1960's found that 43% of 20-year-old college females had had premarital intercourse. This increase shows, if it continues along these lines, that 60% of women born this year will have had premarital intercourse by the time they reach 20 years of age. And these are college women. If we add all women, we may well say 90% of women 20 years old will have had premarital intercourse. Now it is quite true that people from higher socio-economic and educational levels have more varied and imaginative sexual lives; however, people from lower socio-economic levels invariably start sooner. The incidence of gonorrhea in the younger age group is high; but not higher now than six years ago. I think that we continue to fool ourselves. We look at the incidence of gonorrhea as we say, "My goodness, twenty-five percent of the patients with gonorrhea are under twenty years of age," and then we forget about it. We come back five years later and say, "My goodness, what are these girls doing!"

Two days ago, the Richmond city newspapers reported that 8% of the girls at a local high school are pregnant, and everyone looked at this with amazement. Well, 8% of those girls have been pregnant for a long time. Seniors in high school are sexually mature girls. I think we must accept these facts. Once a girl has had intercourse for the first time, be it at 14, 15, 16, or 18, she is not going to revert.

Some people blame the current surge in the incidence of gonorrhea on birth control pills. They say that when the condom was used there was a lesser incidence. This is extremely difficult to prove; I haven't seen any condom companies going out
of business lately. It amazes me that a fair number of adolescent women get birth control pills primarily because they don't want to get pregnant. They would not, however, even consider carrying condoms for the same protection. Condoms have some effect in decreasing the spread of gonorrhea, but would you be happy to rest back on condoms for birth control? No one has been, so why should you be satisfied with a condom as a means of controlling the spread of gonorrhea.

There is a current interest in antibiotic vaginal cream. I have a great deal of trepidation about any medication that is antibiotic and therefore antigenic in nature that is persistently rubbed on a mucous membrane. I think this would be an excellent way to sensitize half the population of the country.

The limitations of public education must be realized. The basic idea of alerting the public to the inherent dangers of sexual contact is of academic interest but hardly practical as policy. The increasing sales of tobacco should reinforce that point. It may be of value to disseminate information about the signs and symptoms of venereal disease because it is likely to bring infected patients to medical attention, hopefully before they spread the disease. This is particularly applicable to syphilis because it has a long incubation period during which the patient is noninfectious and may be cured before spreading the disease. Gonorrhea's short incubation period, 4-10 days, makes it difficult for the physician to get to the patient prior to the further spread of the disease even under the best of circumstances.

At this point in time, the most intensive efforts toward education should be made in the medical schools. Very shortly these students will be faced with large numbers of patients with venereal disease, and we must prepare them. Unfortunately, this area in the medical school curriculum has been progressively crowded out by what seemed more important. It is now apparent that even though the prevalence of venereal diseases may wax and wane, they will always represent a sizable medical problem. We must gear medical education and medical reeducation to meet these needs.

REFERENCES


Schmale, J. D., Martin, J. E., Jr. and Domescik, G. Observations on the culture diagnosis of gonorrhea in women. JAMA 210:312, 1969.


The VD Crisis. From the International Venereal Disease Symposium, St. Louis, Mo. 1971.

Today's VD Control Problem. Published by American Social Health Association.
