Treatment of Gonorrhea in Oregon by the Reporting Private Physician

ROBERT B. DELF, Jr., BA, and RONALD L. HOFELDT, MD

OREGON has experienced a progressive increase in the reported incidence of gonorrhea since 1955. In 1970, the State ranked 11th (*1*) nationally, with a reported incidence of 328.0 per 100,000 based on 6,793 reported cases. This is only a fraction of the true incidence, however, because an estimated 30,000 cases are not reported (*2*). Reports from private physicians account for 36.3 percent of the total documented cases in Oregon. The 1970 incidence is the highest reported in the history of the State.

Of the reasons cited for this increase, few are as complex as the therapeutic management of gonorrhea. As the gonococcus continues to develop a relative resistance to penicillin therapy (*3*), ever-increasing doses are necessary, and the physician is confronted with a plethora of new therapeutic agents.

We carried out a study to determine the current status of treatment by the Oregon private physicians who do report venereal disease cases, as required by law, to the Oregon State Health Division. We considered both the appropriateness of treatment and the physician's adherence to recommended therapy.

Method

Sample selection and criteria. The Oregon State Health Division receives reports of gonorrhea in two ways: (*a*) voluntary reports made on communicable disease case cards that are sent directly by the physician and (*b*) laboratory reports sent in either by the State public health laboratory or private laboratories.

Reports for both males and females received by either method (excluding duplications) from June 21, 1971, to August 13, 1971, were considered for the study if they met the following criteria: (*a*) the patients were treated and reported exclusively by private physicians or their laboratories (public clinic and emergency room patients being excluded); (*b*) the patients had acute cases only and were being treated for the first time. Males with rectal gonorrhea were excluded because these patients might have presented special diagnostic or treatment problems.

After a report was received that met the criteria, the physician was then telephoned to ascertain what treatment had been given. Only those patients who had received the full amount of medication by prescription or injection, or by both methods, were included. Information was accepted either from the physician or from his nurse if she read the schedule from the patient's chart.

Definitions. The two categories of this study, recommended treatment and appropriate treatment, were defined as follows:

For the first category—recommended treatment—the 1971 Physician's Desk Reference (PDR) (*4*) was used as the standard for evaluation for two reasons: (*a*) it is a readily accessible and highly visible publication and (*b*) it is published in cooperation with the pharmaceutical manufacturers, and each descriptive and prescriptive notation is approved by the manufacturer and the Food and Drug Administration.

After a treatment schedule was obtained from a private physician, the drug used was referenced and the PDR-manufacturer dosage recorded.

By referring to the PDR, we then determined whether the private physician's schedule was:

Mr. Delf is a public health advisor, Center for Disease Control, Atlanta, Ga., assigned to the Oregon State Health Division, Portland. Dr. Hofeldt is an intern at Providence Hospital, Portland. Tearsheet requests to R. B. Delf, Jr., Oregon State Health Division, Venereal Disease Program, 1400 SW Fifth Ave., Portland, Oreg. 97201.

AT LEAST RECOMMENDED—includes schedules that met or exceeded the length of treatment, quantity, or frequency of dose recommended in the PDR.
SUBRECOMMENDED—includes schedules with a length of treatment, quantity per dose, or frequency of dose less than recommended in the PDR.
NOT RECOMMENDED—includes therapeutic agents not recommended for the treatment of the usual uncomplicated case of gonorrhea. The primary example of this type of drug is benzathine penicillin.

The second category of evaluation—appropriate treatment—was considered as a single entity without regard to the effectiveness of the schedule in question. Thus, we defined appropriate treatment as a single drug (antibiotic or chemotherapeutic agent) administered or prescribed at a single clinic visit. We considered inappropriate any schedule that included two or more drugs or re-

Table 1. Distribution of 187 patients with gonorrhea among 150 reporting private physicians, by sex of patients, Oregon, June 21–Aug. 13, 1971

Patients per physician	Number of physicians	Total patients		
		Male	Female	Both sexes
1 female	50	.....	50	50
1 male	69	69	.....	69
2 males	10	20	.....	20
2 females	10	.....	20	20
1 male, 1 female	7	7	7	14
3 males	2	6	.....	6
1 male, 3 females	1	1	3	4
4 females	1	.....	4	4
Total	150	103	84	187

Table 2. Drugs that 150 reporting private physicians used for treating gonorrhea, by treatment schedule and by sex and number of patients, Oregon, June 21–Aug. 13, 1971

Drugs used	Males		Females		Both sexes	
	Schedules	Patients	Schedules	Patients	Schedules	Patients
One drug						
APPG [1]	8	41	7	25	15	66
APPG and probenecid [2]	4	5	2	9	6	14
Benzathine penicillin G	4	7	3	5	7	12
Benzathine penicillin G and probenecid	2	2	.....	.....	2	2
Tetracycline	5	8	10	12	15	20
Doxycycline	5	5	5	7	10	12
Ampicillin	3	3	6	9	9	12
Ocycillin	1	1	.....	.....	1	1
Potassium phenoxymethyl penicillin	1	1	.....	.....	1	1
C/R penicillin	1	1	.....	.....	1	1
Sodium dicloxacillin mono hydrate	.....	.....	1	1	1	1
Two drugs						
APPG and potassium phenoxymethyl penicillin	.....	.....	4	4	4	4
APPG and doxycycline	5	5	2	2	7	7
APPG and benzathine penicillin G	2	2	2	2	4	4
APPG and ampicillin trihydrate	2	2	.....	.....	2	2
APPG and ampicillin	3	3	1	1	4	4
APPG and tetracycline	3	4	3	3	6	7
APPG and oral penicillin G tablets	2	2	.....	.....	2	2
APPG and erythromycin	1	1	1	1	2	2
Benzathine penicillin G and oral penicillin G tablets	1	1	.....	.....	1	1
Benzathine penicillin G and erythromycin	2	2	.....	.....	2	2
Benzathine penicillin G and tetracycline	2	2	1	1	3	3
Benzathine penicillin G and doxycycline	1	1	.....	.....	1	1
Benzathine penicillin G and ampicillin	1	1	.....	.....	1	1
Tetracycline and clindamycin HCL hydrate	1	1	.....	.....	1	1
Tetracycline and ampicillin	.....	.....	1	1	1	1
Tetracycline and doxycycline	.....	.....	1	1	1	1
Three drugs						
APPG and demeclocycline hydrochloride and potassium phenoxymethyl penicillin	1	2	.....	.....	1	2
Total	61	103	50	84	111	187

[1] Aqueous procaine penicillin G.
[2] Probenecid is used only as an adjunct to antibiotic therapy and therefore is not counted as a separate drug.

Table 3. Evaluation, based on Physician's Desk Reference, of treatment schedules used for patients with gonorrhea by 150 reporting private physicians, Oregon, June 21–Aug. 13, 1971

Evaluation	Appropriate treatment		Inappropriate treatment		Total	
	Number of patients	Percent of total	Number of patients	Percent of total	Number of patients	Percent of total
Males						
At least recommended	50	48.5	23	22.3	73	70.8
Subrecommended [1]	16	15.5	14	13.5	30	29.1
Total	66	64.0	37	35.8	103	100.0
Females						
At least recommended	44	52.3	17	20.2	61	72.6
Subrecommended [1]	16	19.0	7	8.0	23	27.4
Total	60	71.3	24	28.2	84	100.0
Total patients						
At least recommended	94	50.2	40	21.3	134	71.6
Subrecommended [1]	32	17.1	21	11.2	53	28.3
Total	126	67.3	61	32.5	187	100.0

[1] The subrecommended category includes drugs not recommended for the treatment of gonorrhea.
NOTE: Because of rounding of total percentages, they may not exactly equal the sum of their components.

quired the patient to make additional visits to the clinic to receive continued treatment or further prescriptions. Although arbitrary, this definition was chosen because neither the Public Health Service recommendations nor the PDR schedules indicated that more than one drug needed to be given at one time. Probenecid is used only as an adjunct to antibiotic therapy and therefore is not counted as a separate drug. As defined, this second category applies only to the initial treatment of acute uncomplicated gonorrhea, and all schedules listed in this paper follow that application.

Results

Approximately 539 gonorrhea morbidity cards and laboratory reports were received by the Oregon State Health Division during the 11-week interval of this study. We selected 187 cases that met the criteria for the study. The 187 patients consisted of 103 males and 84 females, who were treated by 150 physicians; 119 of these physicians each treated only 1 male or 1 female, while 31 treated more than 1 (table 1). Forty-nine percent of the patients were treated by physicians in Multnomah County (Portland) and the remainder by physicians in 19 other counties throughout Oregon. Two physicians refused to disclose their patients' treatment schedules.

The 103 males were treated according to 61 different treatment schedules, which included 24 separate drug combinations. Seventy-two percent were treated with one antibiotic, 26 percent with two antibiotics, and 2 percent with three antibiotics (table 2). For the 84 females, 50 different treatment schedules in 16 different drug combinations were used. Eighty-one percent of the 84 were treated with one antibiotic and 19 percent with two antibiotics. The total treatment schedules were made up of 12 different antibiotics used in various combinations, dosages, and frequencies of administration. The majority (76 percent) of the total patients were treated with only one antibiotic, although 23 percent received two antibiotics and 1 percent received three separate antibiotics.

Aqueous procaine penicillin G was the most frequently used antibiotic, singly or in combination with another medication (61 percent). Tetracycline was overall the second most commonly used antibiotic, singly or in combination with another drug. Benzathine penicillin G was the third most commonly used antibiotic.

Males. Of the 103 males, 29 percent received treatment subrecommended in the PDR (table 3). Of the 71 percent who received at least the recommended treatment, one-third received inappropriate treatment. Of the 103 males, 10 percent were treated exclusively with an antibiotic that

was not recommended in the management of gonorrhea, and 25 percent received a nonrecommended antibiotic alone or in combination with another antibiotic.

Females. Of the 84 females, 27 percent received treatment subrecommended in the PDR (table 3). Of the 73 percent who received at least the recommended treatment, 28 percent received inappropriate treatment. Fifty-two percent of the females received treatment which could be considered as recommended and appropriate.

Of the 84 females, 7 percent received a nonrecommended antibiotic solely as their treatment for gonorrhea, while 15 percent received a nonrecommended antibiotic alone or in combination with another antibiotic.

Both sexes. Of the total population treated, 71 percent of the 187 received a treatment that was at least recommended (table 2). Only 50 percent received an appropriate and at least recommended treatment.

Thirty-three percent of the patients received inappropriate treatments, and 11 percent were treated under both an inappropriate and subrecommended treatment schedule.

Discussion

Few diseases have had such exposure in establishing single-treatment schedules as gonorrhea. It is surprising, therefore, to find such a variation in regimens used by private physicians. The Public Health Service currently recommends aqueous procaine penicillin G and tetracycline as the drugs of choice for the treatment of gonorrhea (*5*). The major difference between the PDR and PHS schedules is that the PHS schedule recommends a 1.5 gram loading dose of tetracycline necessary to initiate a substantial blood level. If we apply the same method of evaluation to PHS schedules, 34 percent of the males and 38 percent of the females received a subrecommended schedule. Only 45 percent of the 187 patients received an appropriate and at least recommended treatment (table 4). Only 1 of the 33 patients who received tetracycline as part of her therapy was given the initial loading dose.

It is of considerable importance that benzathine penicillin G was the third most commonly used antibiotic. Although highly effective in the treatment of syphilis, benzathine penicillin G is not effective, nor is it recommended, in the management of gonorrhea. The PDR indicates that benzathine penicillin G is used in the treatment of syphilis, yaws, bejel, and pinta (all are treponematoses), but does not indicate its use in the treatment of gonorrhea. According to Schroeter and Pazin (*6*), "Benzathine penicillin G is a good example of a sustained-release preparation producing prolonged low penicillin blood levels that may produce in vivo selection of resistant strains." The use of this drug should be discontinued for the treatment of gonorrhea.

Although 71 percent of the patients received an "at least recommended" schedule, it should not be assumed that the other 29 percent were inadequately treated for their gonorrhea infection. Obviously, many of the schedules were close to the recommended level, and therefore a certain percentage may have been treated effectively. Even recommended schedules, however, do not effect a 100 percent cure rate, and we can assume that some patients either had relapses or failed in an initial cure with the suggested schedules (*7*). One shortcoming of the study was our inability to perform post-treatment examinations, especially on females. This procedure would have allowed us to comment meaningfully on the true adequacy of the schedules used.

If, with a disease such as gonorrhea, which spreads rapidly and has a short incubation period,

Table 4. Evaluation, based on Public Health Service treatment schedule, of schedules used for patients with gonorrhea by 150 reporting private physicians, Oregon, June 21–Aug. 13, 1971

Evaluation	Appropriate treatment		Inappropriate treatment		Total	
	Number of patients	Percent of total	Number of patients	Percent of total	Number of patients	Percent of total
At least recommended	85	45.4	35	18.7	120	64.1
Subrecommended	41	21.9	26	13.9	67	35.8
Total	126	67.3	61	32.6	187	[1] 100.0

[1] Because of rounding, total is not exactly equal to sum of two components.

even a small number of persons are not effectively treated, they can add significantly to the enlarging pool of the disease. This is especially true of the female who, often being asymptomatic, does not report back to the physician for a post-treatment check and continues to infect other persons. It is unfortunate that when such a simple and effective means of cure exists, those persons who are motivated to seek treatment may not receive adequate treatment.

Because appropriate therapy includes the cost and convenience of treatment, it may affect the adequacy in some instances. A return visit to the private physician's office for further injectable or oral medication after the initial visit may necessitate additional costs and lost time for both the physician and the patient. Moreover, patients with venereal disease often do not return for further treatment. Because of the highly infectious nature of gonorrhea, the patient should therefore receive the maximum treatment at the first visit.

The Oregon State Health Division estimates that only 20 to 25 percent of the cases of gonorrhea diagnosed by private physicians are reported. This statistic results in a built-in sample bias, as we have no data on the treatment practices of the nonreporting physician.

Conclusion

Previous surveys have shown that more than 75 percent of the persons with gonorrhea in American communities are treated by local physicians. If, however, as our survey shows, more than 30 percent are inadequately treated by local physicians, then there is a large group of treated but still infected patients, especially asymptomatic females, who are contributing significantly to the increasing incidence of gonorrhea in Oregon. Again, these persons have already sought treatment, but the subrecommended therapy given them precludes their removal from the pool of the infected.

Improving the adequacy of the treatment provided by all physicians is a high priority in any gonorrhea program. Our survey results reveal that efforts along this line need strengthening, and this has become a major priority of the Oregon venereal disease program.

Authors' Addendum

This paper was submitted for publication before the Venereal Diseases Branch, State and Community Services Division, Center for Disease Control, had revised the recommended treatment schedules for gonorrhea in March 1972.

REFERENCES

(1) Fleming, W. L., (chairman), et al.: Today's VD control problem—1971. American Social Health Association, New York, 1971.

(2) Oregon State Health Division: Venereal disease morbodity reports—1970. Portland

(3) Lucas, J. D.: Gonococcal resistance to antibiotics. Southern Med Bull 59: 22–28, April 1971.

(4) Physician's Desk Reference to Pharmaceutical Specialties and Biologicals. Ed. 25. Medical Economics, Inc., Oradell, N.J., 1971.

(5) U.S. Public Health Service: Gonorrhea—recommended treatment schedules. Center for Disease Control, Atlanta, Ga., April 1971.

(6) Schroeter, A. L., and Pazin, G. J.: Gonorrhea—diagnosis and treatment. Ann Intern Med 72: 553–559 (1970).

(7) Roberts, F. G.: Diagnosis and treatment of acute uncomplicated gonorrhea. Southern Med Bull 59: 18–21, April 1971.

DELF, ROBERT B., Jr. (Oregon State Health Division), and HOFELDT, RONALD L.: *Treatment of gonorrhea in Oregon by the reporting private physician. Health Services Reports, Vol. 88, August–September 1973, pp. 601–605.*

Gonorrhea has become a statewide epidemic in Oregon. The current status of treatment for gonorrhea by the reporting Oregon private physician was determined. During an 11-week period, 150 physicians treating 187 patients were queried about the treatment schedules for patients with acute uncomplicated gonorrhea. The Physician's Desk Reference (PDR) and the Public Health Service gonorrhea treatment schedules were used in evaluating the data.

Of 103 males treated for gonorrhea, 29 percent received a treatment which was less than that recommended in the PDR. Of the 84 females treated, 27 percent received a treatment which was less than that recommended in the PDR. A significant number of patients were treated with an antibiotic that is not recommended in the management of gonorrhea. Because proper treatment is imperative in stemming the spread of venereal disease, physicians who give less than adequate treatment must assume a share of the responsibility for the current epidemic.