Identification of the asymptomatic female carrier of *N. gonorrhoeae*

Treatment with ampicillin

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Several factors have contributed to the rapid increase in the number of cases of gonorrhoea seen in the United States. Changing moral standards, an increasingly mobile population, and failure of some physicians to report each case for public health follow-up have all contributed to the increase. Perhaps just as important a cause but often overlooked are the asymptomatic female carriers of *N. gonorrhoeae*. One can only speculate how many cases of gonorrhoea could be traced back to females who harbour inactive but contagious infections of *N. gonorrhoeae*. Published studies on the diagnosis and treatment of gonorrhoea reflect what has been our major concern in controlling the disease. The majority of studies deal with the acute phase of the infection in the male. There are few comprehensive studies of the disease in the female and still fewer on how to diagnose and treat the *asymptomatic* condition in the female.

The purpose of this study was to employ a diagnostic technique previously reported (Martin, Billings, Hackney, and Thayer, 1967) and to determine the efficacy of oral ampicillin in the treatment of asymptomatic female carriers of *N. gonorrhoeae*. Oral ampicillin has proved to be effective in the treatment of acute gonorrhoeal urethritis in males (Marmell, Sills, Brown, and Prigot, 1964; Smith, 1966; McLone, Billings, Hardegree, and Hackney, 1968; Keys, Halverson, and Clarke, 1969) but has not been studied in the female.

Method

A series of 841 women was admitted to the study as they visited the Family Planning Clinic at the University of Arkansas Medical Center. None had symptoms of gonorrhoea or a history of previous infection with venereal disease.

Specimens were taken from the urethra and cervix, and Gram-stained smears were prepared and examined for Gram-negative intracellular diplococci.

Material for culture was also streaked immediately onto chocolate agar which contained Thayer-Martin V-C-N inhibitor and Isovitalex enrichment. Martin and others (1967) have shown that this medium will yield a significantly greater proportion of positive cultures of *N. gonorrhoeae* than chocolate agar alone. The culture plates were examined for colonies after 48 hours' anaerobic incubation.

Patients whose cultures grew *N. gonorrhoeae* were assigned randomly to one of three dosage groups:

Group 1 took 500 mg. ampicillin by mouth every 6 hours to a total of 3 g.

Group 2 took 500 mg. every 6 hours to a total of 6 g.

Group 3 took 500 mg. every 6 hours for a total of 10 g.

Two weeks after starting their treatment, patients revisited the clinic so that post-treatment smear and culture specimens could be obtained. At that time they were also questioned to determine whether they had taken their drug as prescribed and whether they had noticed any urogenital symptoms in sexual partners. Patients who admitted that they had not taken their full dose or who were aware of symptoms in their male partners were dropped from the study and appropriate treatment was continued. Those who remained in the study but still had positive smears or cultures were given an additional course of therapy with ampicillin.

Results

Of the 841 asymptomatic women, 101 (12 per cent.) were found by both smears and cultures to be infected by *N. gonorrhoeae* when they entered the study.

Of these 101 patients, sixty said that they had taken their medication as prescribed and had noticed no symptoms in their male sexual partners. As shown in the Table, 52 had negative smears and cultures after treatment. Two who were positive after taking 3 g. ampicillin were re-treated with 6 g. ampicillin, and when they were checked 2 weeks later the results of genital tests were negative.

In another six cases the tests did not produce results definite enough for the presence or absence of *N. gonorrhoeae* to be determined with certainty. As finally assessed the cure rate in cases treated with 6 g. ampicillin or more was 54 of 60 (90 per cent.).

TABLE Test and treatment results in asymptomatic females treated with ampicillin trihydrate

Dosage groups	Pre-treatment tests				Post-treatment tests						Efficacy		
	Smear		Culture		Smear			Culture			Cure	Incon- clusive	Failure
	+	-	+	-	+	Incon- clusive	-	+	Incon- clusive	-			
1 3 g. (500 mg. 6-hrly for 6 doses)	20	0	20	0	2	2	16	2	2	16	16	2	2*
2 6 g. (500 mg. 6-hrly for 12 doses)	18	2	18	2	0	2	18	0	2	18	18	2	0
3 10 g. (500 mg. 6-hrly for 20 doses)	17	3	20	0	0	2	18	0	2	18	18	2	0
Total—60 cases	55	5	58	2	2	6	52	2	6	52	52	6	2

+ = Positive results

- = Negative results

*These two patients who failed on 3 g. ampicillin were re-treated with a 6 g. schedule; at the end of 2 weeks their smears and cultures were negative

Discussion

Several dose schedules of ampicillin have been studied and found successful in the treatment of gonorrhoea in males. Marmell and others (1964) found a minimum dose of 1.5 g. to be effective in sixteen patients in a series of 124. Smith (1966) found that 250 mg. twice daily for 3 days was successful in 23 of 25 male cases after the infections had been found resistant to various other antibiotics.

No such guideline studies exist on the treatment of asymptomatic female carriers. Their infections are not only more difficult to discover but may also be less amenable to antibiotic treatment when discovered.

Once established in tissue, the infections may become asymptomatic and remain contagious to sexual partners and potentially damaging to a foetus. The improved bacteriological testing methods now at our disposal, however, make it possible to uncover such infections, and it may be concluded from the results in this study that 6 g. oral ampicillin, taken as 500 mg. every 6 hours, are adequate to cure such infections.

Summary

Of 841 female patients reporting to the Family Planning Clinic at the University of Arkansas Medical Center, 101 (12 per cent.) were found to have positive results to smears and cultures for *N. gonorrhoeae*. All were asymptomatic and gave no history of previous venereal disease. Of 60 patients

who reported back to the clinic and said they had followed their instructions, 54 had negative smears and cultures after taking 6 g. or more oral ampicillin, a cure rate of 90 per cent.

References

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Identification de femmes saines porteuses de *N. gonorrhoeae* Traitement par l'ampicilline

SOMMAIRE

101 femmes (12 %) parmi 841 consultant à la Clinique de Planning familial à Université du Centre médical d'Arkansas, furent trouvées positives pour *N. gonorrhoeae* à l'étalement et à la culture. Aucune ne présentait de symptômes ni d'histoire de maladie vénérienne antérieure. Parmi les 60 malades qui se représentèrent à la clinique et assurèrent avoir suivi les prescriptions, c'est-à-dire 6 g. ou plus d'ampicilline par voie buccale, 54 avaient des étalements et des cultures négatifs, soit un taux de guérison de 90 %.