Diagnostic treatment and reporting criteria for gonorrhoea in sexually transmitted disease clinics in England and Wales

1: Diagnosis

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SUMMARY The current methods used in the diagnosis of gonorrhoea are reported. The sites sampled in symptomatic patients who were not gonorrhoea contacts and those sampled in symptomless contacts are described. Urethral specimens were taken routinely from all male heterosexual and active homosexual patients with a urethral discharge but in only 81% and 82% respectively of these patients if they were symptomless gonorrhoea contacts. Not all consultants would repeat investigations (smear and/or cultures) in gonorrhoea contacts if the initial ones were negative; heterosexual male and active homosexual patients were less likely to be seen again. Smears and cultures were performed routinely on women in 97% of clinics, but for men this was so in only 81% of clinics. The wider use of cultures for men, the policy with regard to the taking of urethral specimens from asymptomatic male heterosexual and active homosexual patients who are gonorrhoea contacts, and the number of diagnostic investigations required are discussed.

Introduction

Gonorrhoea is now the second most commonly treated sexually transmitted disease (STD) in England and Wales. It presents a number of problems, the foremost being that the number of notified cases has increased by 50% during the last decade, and that β -lactamase producing strains of gonococci have recently appeared (Ashford *et al.*, 1976; Percival *et al.*, 1976; Phillips, 1976).

The previous paper (Adler *et al.*, 1978) described the background and methods used in an inquiry into the present pattern of care for STDs in England and Wales. This paper is concerned particularly with the current management of gonorrhoea. The first part describes the diagnosis of gonorrhoea and the second the treatment and reporting criteria used by clinics.

Results

SITES SAMPLED

Symptomatic patients who are not contacts

Consultants were asked what methods they used to diagnose men or women presenting with symptoms suggestive of a STD who were not known to be gonorrhoea contacts. Table 1 shows the sites routinely sampled. In all clinics specimens were taken from the urethra in male heterosexuals and active homosexuals with genitourinary symptoms, and from the rectum in passive homosexuals. Specimens were taken routinely from the rectum in active homosexuals in only 96 (56%) clinics and urethral specimens from passive homosexuals in only 100 (58%) clinics. In the clinics in which specimens were not normally taken from these two sites this would be done if the patients admitted to being both active and passive or if they had additional signs or symptoms that warranted further investigations. In none of the clinics would a throat swab be taken in male heterosexual patients unless there were specific indications—such as a sore

Table 1 Sites sampled routinely in symptomatic patients (non-contacts)

<i>Patients</i>	<i>Sites</i>	<i>Clinics</i>	
		<i>No.</i>	<i>%</i>
Males (171)			
Heterosexuals	Urethra	171	100.0
	Throat	0	0.0
Active homosexuals	Urethra	171	100.0
	Rectum	96	56.1
	Throat	24	14.0
Passive homosexuals	Rectum	171	100.0
	Urethra	100	58.4
	Throat	24	14.0
Females (173)			
	Urethra	171	98.8
	Cervix	173	100.0
	Vagina	166	95.9
	Rectum	15	8.6
	Throat	3	1.7

throat or a history of oral sex. In the homosexuals, 24 (14%) clinics took throat specimens routinely even if these indications were not present. In almost all the clinics seeing women the urethra, cervix, and vagina were sampled (99%, 100%, and 96% respectively). The large number of clinics in which vaginal specimens were taken probably reflects the fact that the patients were symptomatic and not known to be gonorrhoea contacts, therefore making it necessary to exclude candidosis and trichomoniasis.

Symptomless patients who are contacts

The procedure adopted by physicians in relation to symptomless patients who presented for examination and who were not known to be contacts has already been reported (Adler *et al.*, 1978).

Consultants were also asked about their management of symptomless gonorrhoea contacts. The sites tested routinely on symptomless male contacts of patients with gonorrhoea are shown in Table 2. Urethral specimens were taken as a routine from symptomless heterosexuals in 138 (81%) clinics and

Table 2 Sites sampled routinely in symptomless male contacts of patients with gonorrhoea

Patients	Sites	Clinics (N=171)	
		No.	%
Heterosexuals	Urethra	138	80.7
	Prostate	15	8.7
	Throat	1	0.5
Active homosexuals	Urethra	140	81.8
	Rectum	93	54.3
	Throat	29	16.9
Passive homosexuals	Rectum	165	96.4
	Urethra	86	50.2
	Throat	29	16.9

in 140 (82%) clinics from active homosexuals. In 96% rectal specimens were taken from passive homosexual contacts. As with the symptomatic patients who were not contacts, fewer clinics (54%) took routine rectal specimens from active homosexuals and 50% took urethral specimens from passive homosexuals. However, if patients volunteered that either of these sites had been at risk or if they had relevant symptoms or signs, investigations were performed.

In 99% of clinics seeing symptomless female contacts of males with gonorrhoea specimens were taken as a routine from the urethra and all clinics took specimens from such patients from the cervix (Table 3). Vaginal specimens were taken in 91% of

Table 3 Sites sampled routinely in symptomless female contacts of patients with gonorrhoea

Sites	Clinics (N=173)	
	No.	%
Urethra	171	98.8
Cervix	173	100.0
Vagina	157	90.7
Rectum	35	20.2
Throat	9	5.2

clinics and once again this reflects the doctors' attempt to exclude candidosis and trichomoniasis in association with gonorrhoea. Rectal specimens were taken routinely in 35 (20%) clinics. Of the remaining 138 clinics in which routine rectal specimens were not taken, the consultants in 12 of them indicated that they were never taken, whereas in the other 126 clinics this was done if a specific reason existed. It was extremely rare for consultants to take routine throat specimens (nine clinics), in 16 clinics specimens were never taken from this site but in the remaining 148 they would be in certain circumstances. The reasons for which rectal and throat specimens were taken in those clinics, in cases in which it was not done routinely, are shown in Table 4.

Table 4 Reasons for taking rectal and throat specimens in female contacts of patients with gonorrhoea

Reason	Rectal specimens (N=126)		Throat specimens (N=148)	
	No.	%	No.	%
History of rectal/oral sex	35	27.8	44	29.7
Rectal/oral symptoms or signs	47	37.3	89	60.1
Gonorrhoea not found elsewhere	28	22.2	14	9.5
Gonorrhoea not found elsewhere plus rectal/oral symptoms or signs	16	12.7	1	0.7

Another facet of examining gonorrhoea contacts is their follow up if the initial investigations (smear and/or cultures) are negative. Table 5 shows the

Table 5 *Number of further occasions that examinations and/or tests repeated in gonorrhoea contacts in whom initial tests negative*

No. of times repeated	Hetero-sexuals		Active homo-sexuals		Passive homo-sexuals		Females	
	No.	%	No.	%	No.	%	No.	%
None	30	17.5	23	13.5	20	11.7	22	12.7
1	50	29.2	43	25.1	38	22.2	30	17.4
2	42	24.6	54	31.6	53	31.0	58	33.5
3	32	18.7	37	21.6	46	27.0	47	27.1
>3	17	9.9	14	8.2	14	8.1	16	9.3
Total	171	100.0	171	100.0	171	100.0	173	100.0

policy adopted. Heterosexual males and active homosexuals were less likely to be seen again, tests were not repeated on passive homosexuals in 20 (12%) clinics or on female patients in 22 (13%).

Investigations before treatment

Microbiological and culture services were available in most clinics, but they were not necessarily used to reach a diagnosis. Consultants were asked what methods of diagnosis they would apply in patients presenting with urethral, vaginal, or rectal discharge or symptoms (Table 6). Smears and cultures were

Table 6 *Methods of diagnosis used in symptomatic male and female patients*

Method	Clinics for men		Clinics for women	
	No.	%	No.	%
Smears and cultures in <i>all</i> cases	139	81.3	168	97.1
Smears in all cases and cultures in <i>selected</i> cases	24	14.0	3	1.7
History, examination plus smears <i>only</i> in all cases	8	4.7	2	1.2
Total	171	100	173	100

performed as a routine in nearly all the clinics (97%) seeing women but in clinics seeing men the physicians were more selective about the use of cultures. They were used routinely in all patients in only 139 (81%) clinics. The reasons for performing cultures in the 24 clinics for men, where it was done only on selected patients were as follows: equivocal smears (eight clinics), for possible legal reasons (seven clinics), patients at high risk (five clinics), and for rectal cases (four clinics).

In eight clinics where male patients were seen smears only were used even though a culture service

was available in seven of them. In the two clinics for women that used smears only, there was no option as these had no culture facilities.

Microscopical examination

All clinics had a microscopy service but in seven (4%) for men and in nine (5%) clinics for women the results were not available when patients first attended. The consultants were asked how they would manage such a situation in a symptomatic patient who was not a known contact (Table 7).

Table 7 *Action taken when results of smears from symptomatic patients (non-contacts) are not available at first consultation*

Action taken	Clinics for men		Clinics for women	
	No.	%	No.	%
Always treat	5	2.9	3	1.7
Selective treatment	2	1.2	3	1.7
Never treat	0	0.0	3	1.7
Not applicable (smears available)	164	95.9	164	94.9
Total	171	100	173	100

As the patient was not a contact for gonorrhoea or any other specific disease, and since smear findings were not available they would treat empirically if they so decided. Physicians in five out of the seven clinics for men that lacked immediate microscopy, indicated that they would treat the patient as suffering from gonorrhoea on the basis of the clinical history and examination. The consultants working in the two remaining clinics treated in selected instances—such as, if the patient was in discomfort or in transit. In the nine clinics for women without immediate smear results, three physicians would not institute treatment until after microscopical confirmation, three always treated for gonorrhoea on clinical evidence, and the remaining three only if the patient had suspected salpingitis or Bartholinitis, was in discomfort, or was about to leave the area.

Cultures

All the consultants working in clinics with a culture service, who had not already treated on clinical evidence, were prepared to treat male patients on the presumptive smear findings before the culture results were available. Most consultants would also treat women on these grounds but a few (8% of clinics with a culture service and where patients had not been treated on clinical evidence) would await culture confirmation. The reasons given were that the smear reading could be wrong, that there were legal reasons, and/or the woman was married.

It has been reported previously that 99% of clinics had access to culture facilities and that 49% of them used transport medium. The definitive type of media used for making or excluding the diagnosis of gonorrhoea are shown in Table 8. The most

Table 8 Culture media used to exclude or confirm diagnosis of gonorrhoea

Culture medium	Clinic (N=173*)	
	No.	%
1. Chocolate agar with antibiotic (Thayer-Martin or modifications)	72	41.6
2. Chocolate agar without antibiotic	25	14.6
3. Columbia blood agar with antibiotic	13	7.5
4. Columbia blood agar without antibiotic	11	6.3
5. Gonococcal selective	8	4.6
6. Difco selective	8	4.6
7. Transgrow	3	1.7
8. Others	5	2.9
1+2	6	3.5
1+3	4	2.3
2+4	5	2.9
2+5	1	0.6
3+4	8	4.6
3+8	1	0.6
Not known	3	1.7
Total	173	100

*2 Clinics—no culture service available

commonly used medium was a Thayer Martin medium or one of its modifications. In some clinics more than one medium was used equally often and the names of these are given. In 80 (46%) clinics sugar fermentation was carried out to verify that the Gram-negative organism found was *Neisseria gonorrhoeae*. In a further 29 (17%) clinics fluorescent techniques were used in addition to sugar fermentation and in 12 (7%) clinics fluorescence was used on its own. In 51 (29%) clinics neither of these two supportive tests was performed.

Discussion

THE USE OF CULTURES

The fact that in almost all the clinics (97%) smears and cultures were performed in symptomatic women is a reflection and appreciation of the difficulties in excluding the diagnosis of gonorrhoea in the female on microscopical evidence alone. Many authors have reported on the poor correlation between smear and culture results (Macleod *et al.*, 1934; Cooper *et al.*, 1950; Catterall, 1970; Frisch, 1975; Barlow *et al.*, 1976; Evans, 1976). Even some of the more contemporary work suggests that 45% of cases confirmed subsequently on culture would be missed by the use of smear alone. In clinics for men the situa-

tion was different in that in 32 (19%) of them smears alone were relied on in all or selected cases to establish a diagnosis in the symptomatic patient. In two recent books, the authors (Catterall, 1975; King and Nicol, 1975) suggest that microscopy should always be complemented by the use of cultures.

Osmond (1936) was among the first workers to show the necessity of using both techniques simultaneously in men. This has been confirmed in other more recent studies (Reznicek *et al.*, 1971; Dans and Judson, 1975). Dans and Judson (1975) compared urethral smears for gonorrhoea with culture results in men. They showed false positive results for smears ranging from 1.8% to 21% for different observers, the less experienced the observer the higher the rate. However, more important was the fact that the rate for smears considered to be negative which were subsequently positive on culture was between 1.4% and 8.3%. Reznicek *et al.* (1971) made similar observations and reported that in 11% of cases of gonorrhoea the smear was considered to be negative but the cultures were subsequently positive. These studies highlight the importance of using cultures to confirm microscopical findings and that skill and experience are required to prepare and read the slides.

It is interesting that these two studies (Reznicek *et al.*, 1971; Dans and Judson, 1975) are American as a pamphlet (Department of Health Education and Welfare, Public Health Service and Mental Health Administration, and Center for Disease Control, 1971) suggests that for males 'microscopic demonstration of Gram-negative intracellular diplococci on smear of urethral exudate constitutes sufficient basis for the diagnosis of gonorrhea'. This view may be justified in situations in which resources and supporting staff are limited, but is the service sufficient if up to 11% of patients with gonorrhoea may be missed because of the lack of a culture service or failure to use it? The British Co-operative Clinical Group (1971) reported that smears and cultures were used in all men in 59% of clinics. The present study shows that there has been a change since that time and that now 81% of clinics do this. No doubt this improvement will continue. Notwithstanding this increased use of cultures it is important that microscopy should be as accurate as possible. The staining and examination of smears calls for skill and experience. It is important that doctors and nurses are adequately trained in these techniques and that any disparity between smears and cultures is continually monitored. This can be done by retaining smears until the culture reports are available and by re-examining the slides if there is any difference, thus allowing for regular evaluation.

SITES SAMPLED/REPEATING DIAGNOSTIC TESTS

Once a patient presents at a clinic the diagnosis of gonorrhoea should not be missed. The previous paper was concerned with the problems of asymptomatic disease in relationship to symptomless patients requesting examination. It was reported that in only 58% of clinics would a urethral smear be taken from the heterosexual male and in 63% of clinics from the active homosexual. When the patient is a named gonorrhoea contact the proportions are 81% and 82% respectively. This is an improvement but if there is a history of exposure, in the light of our current awareness of asymptomatic gonorrhoea, it is recommended that all male heterosexuals and active homosexuals should have urethral tests taken.

It has been pointed out that there are difficulties in making a firm diagnosis of gonorrhoea in women using Gram-stained smears, which is all that is available at the time of the first visit. It is therefore desirable that women be encouraged to return for a second visit by which time the culture results are usually available. Even so, recent work suggests that the culture results are not infallible. Catterall (1970) drew attention to this and showed that if only one set of investigations was performed 34% of cases would be missed, after two sets it would be 14%. Later work, using Columbia blood agar as a medium instead of the previous McLeod's chocolate agar, showed an improvement but one set of investigations was still negative in 9% of patients, and 2% were missed after two sets (Chipperfield and Catterall, 1976). These figures have been confirmed by others (Barlow *et al.*, 1976; Evans, 1976). In view of these reports it is important that all female contacts of gonorrhoea should have cultures repeated at least once, and preferably twice, if the initial smears and cultures give negative results. This was not universal practice in the clinics studied. In 13% of clinics seeing female patients investigations were not repeated if the initial ones were negative. Likewise female contacts need not be examined more than twice after the original test (three tests in all). Tests were repeated three or more times on female patients who were gonorrhoea contacts in 36% of clinics.

Conclusions

It has been reported that almost all consultants seeing symptomatic women perform smears and cultures as a routine. For men there has been a substantial improvement since the last British

Co-operative Clinical Group (1971) study, but cultures are not used routinely in 19% of clinics. It is suggested that the use of cultures allows for evaluation of microscopical techniques within clinics and that this should be a continuous process. Likewise not all consultants would take urethral specimens from asymptomatic heterosexual male and active homosexual patients who were gonorrhoea contacts. Physicians should be encouraged to take specimens from this site in these patients. Finally it is suggested that a more rational approach be adopted in repeating tests in women who are gonorrhoea contacts in whom the initial sets of tests are negative.

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