

# Diagnosis of gonorrhoea in women

## *Role of the rectal sample*

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In 1929, Hayes, a proctologist at Houston, Texas, wrote 'Gonorrhoea of the anus and rectum is not at all a rare disease, yet I think it is a disease that has been too much overlooked in the past'. Reviewing 1,218 cases, he found rectal gonorrhoea in 75 patients. He concluded that gonorrhoeal proctitis was much more frequent in women than in men and that auto-inoculation was the chief mode of infection. Martin (1935), quoting Jullien (1886), stated that rectal gonorrhoea 'is a disease one sees only if one looks for it'. In Martin's own series of 111 women with urogenital gonorrhoea, 30 per cent. also suffered from rectal gonorrhoea. Clements and Hughes (1935), working at St. Thomas's Hospital, London, found that, of the 128 female cases with evidence of gonorrhoea by microscopy and/or culture, 69 were found by the same methods of examination to be suffering from gonorrhoeal proctitis. In eight of their patients who were under observation after treatment of genitourinary gonorrhoea, rectal gonorrhoea was found in follow-up tests at which urethral and cervical specimens revealed no gonococci. These patients would have been discharged as cured but for the rectal examination. Furthermore, in seven (5.4 per cent.) of their cases, gonococci were never found at any time other than in the rectum.

Nicol (1948) demonstrated gonococci in rectal samplings of 26 of 74 consorts of men with proven gonorrhoea. In this series, five (6.7 per cent. of the total) gave positive results only in the rectum. He suggested that rectal testing should be a part of the routine examination and should always be included in the tests for cure.

Jensen (1953) found positive rectal cultures in 63 of a total of 205 patients infected with gonorrhoea, an incidence of 31 per cent. In his series, four cases (2 per cent.) were found to be positive only in the rectum. He also was of the opinion that the great majority, perhaps all, of these cases of rectal gonorrhoea in women originated through peno-anal contact.

Roepstorff and Hammarström (1966) found rectal gonorrhoea in 113 of 355 positive cases, an incidence of 31.9 per cent. In 26 of the 113, the rectum was the only positive site (7.3 per cent. of the total). Scott and Stone (1966) found rectal gonorrhoea in 31 of 104 consorts of men with gonorrhoea, an incidence of 30 per cent., and three (3 per cent.) had rectal disease only.

Schmale, Martin, and Domescik (1969), trying to determine at which anatomical site or sites gonococci can be most commonly found, examined four sites (cervix, urethra, vagina, and rectum). They came to the conclusion that the cervix was the single site most often infected. When the results for any two sites were combined, the cervical and rectal cultures gave the greatest frequency of detection. Of the patients with gonococcal infection, 50 per cent. had positive rectal cultures. Seven (6.2 per cent.) of their 112 patients with gonococcal disease had positive rectal cultures only.

Olsen (1971), examining 265 women who were contacts of men with gonorrhoea, found the rectal site to be positive in 169 patients (63.7 per cent.); the rectal site alone was positive in eight patients (3 per cent.).

Pariser (1972) reported that 40 per cent. of female patients diagnosed as cases of gonorrhoea showed positive rectal cultures. Moreover, of this latter group, 20 per cent. showed a positive rectal but negative cervical test.

Not all these authors used proctoscopes. Nicol (1948), Scott and Stone (1966), and Schmale and others (1969) certainly did, but Jensen (1953), Roepstorff and Hammarström (1966), and Olsen (1971) appeared to have taken specimens from the anal canal.

In this climate of renewed interest, stemming mainly from the increased reliability of cultural methods using modern selective media, an investigation was carried out with three aims in view:

- (a) To establish the current incidence of rectal gonorrhoea in female contacts of men with proven gonorrhoea.

- (b) To learn how many cases would have been missed had samples from the anal canal and rectum not been examined.
- (c) To assess the relative merits of specimens from the anal canal and the rectum.

### Material and methods

The series comprised 107 consecutive female consorts of men with culture-proven gonorrhoea. All attended the Special Clinic, Royal Infirmary, Sheffield, between the months of December, 1972, and April, 1973. Five female patients were included twice, as each attended as a new contact on a second occasion. The youngest patient was 15 years old and the oldest 42 years, 35 were married and the remainder either single, divorced, separated, or widowed. Direct questions were asked to elicit any history of rectal intercourse when rectal or anal specimens proved to be positive. Urethral, endocervical, anal canal, and rectal smears and cultures were taken from all patients. Anal canal specimens were taken blindly through the anus without the help of proctoscope or speculum.

Rectal specimens were taken after the introduction of a disposable plastic proctoscope or the smallest size of bivalve vaginal speculum. A small amount of 'KY' lubricant jelly was used. Tests have shown that this can be done without affecting the subsequent cultures. The condition of the rectal mucous membrane was noted.

Smears were stained by Gram's method and examined immediately in the clinic. Culture specimens were taken using carbon-impregnated swabs and sent to the laboratory in Stuart's transport medium. They were usually 'plated out' within 24 hrs. Both a non-selective Columbia chocolate agar medium (Ellner, Stoessel, Drakeford, and Vasi, 1966) and a selective agar medium containing vancomycin, colistin, and trimethoprim (Seth, 1970) were inoculated. Plates were examined after 48 hrs' incubation at 36°C. in an atmosphere of 10 per cent. CO<sub>2</sub>, and suspected gonococcal colonies were identified by conventional biochemical means.

Freedom from gonorrhoea was accepted only after three negative sets of smear and culture tests from all four sites. These were carried out daily whenever possible. In fact, 65 patients were found to be infected on the first examination, five needed two examinations, and only one required three sets of tests before a positive result was obtained.

### Results

Table I shows that 71 of 107 patients were found to be positive by specimens from one or more sites. Rectal and/or anal canal specimens were positive in 32 of these 71 (45 per cent.) Of the 32 patients, four were positive in rectal or rectal and anal canal specimens but negative in urethral and cervical samplings. This gives an incidence of 5.6 per cent. of the total positives and 3.7 per cent. of the total number of patients examined. All four had positive rectal specimens but the anal canal specimens were positive in only two.

TABLE I *Incidence of anorectal gonorrhoea in 107 female contacts*

No. of patients	Total no. positive by any one, all, or any combination of urethral, cervical, anal canal, and rectal specimens	No. positive by anal canal and/or rectal specimens	No. positive only by anal canal and/or rectal specimens
107	71	32	4

Table II shows a further analysis of the 32 patients with positive anal canal and/or rectal specimens. Twelve of these women were positive at both sites. Five of them were positive only in anal canal specimens and fifteen only in rectal specimens. Cultures were positive in all 32 patients, but only ten of them had positive smears also. None was positive by smear alone. Of these 32 patients fourteen (44 per cent.) admitted rectal intercourse, partial rectal penetration, or peno-anal contact. Of the 32 patients, only seven (22 per cent.) showed muco-pus and/or signs of congestion in the rectum. No patient had any symptoms referable to the rectum.

TABLE II *Anorectal gonorrhoea in 71 infected female contacts*

Total no. positive by anal canal and/or rectal specimens	No. positive by both anal canal and rectal specimens	No. positive only by anal canal specimens	No. positive only by rectal specimens
32 (45 per cent.)	12	5	15

Table III shows the number of isolations obtained from cultures made during the course of the trial. The actual number set up for each patient varied, but the relative performances of the selective and non-selective media can be assessed from these figures. In this trial the non-selective medium proved superior for the cervical site, yielding 46 isolations, whilst only 39 were obtained on the selective medium. Both

TABLE III *Isolation of gonococci on selective and non-selective media*

Medium	No. positive at each site			
	Urethra	Cervix	Anal canal	Rectum
Non-Selective	33	46	5	12
Selective	33	39	20	29

media were equally useful for the urethral site, each yielding 33 isolates, but for the rectal and anal sites the selective medium was markedly superior, yielding 29 and 20 positive cultures respectively, compared with twelve and five on the non-selective medium.

### Discussion

The overall incidence of positive results for gonococci from rectal and anal canal specimens in this series (45 per cent.) compares with the 50 per cent. of Schmale and others (1969) and the 40 per cent. of Pariser (1972), and approximates to the figures of Scott and Stone (1966) and of Roepstorff and Hammarström (1966), which were in the region of 30 per cent.

All these isolation rates were achieved with the help of selective media, and these must have had a significant bearing on the results. Thus Wilkinson (1965), using a combination of ristocetin and polymyxin formulated by Thayer and Martin (1964), found almost twice as many isolations on the selective medium as he obtained on his usual non-selective medium. In this way Roepstorff and Hammarström (1966) improved their yield from 17 to 58 isolations—an increase of 241 per cent.

Swarming *Proteus* spp. contaminants were not suppressed by this medium, nor by the re-formulation of vancomycin, colistin, and nystatin (Thayer and Martin, 1966). This medium was used with effect by Schmale and others (1969). Reyn and Bentzon (1972) found a similar combination to be most useful for rectal specimens—despite the fact that 8 per cent. of their plates were overgrown.

Seth (1970) overcame this problem by adding trimethoprim to the Thayer and Martin formula. This medium (but without the nystatin) was used in the present investigation and proved eminently satisfactory for anal canal and rectal specimens. A total of 66 positive anal canal or rectal cultures were obtained during the course of this trial. Of these, seventeen were on non-selective medium and 49 on selective medium; the isolation rate was thus 188 per cent. higher for the selective than for the non-selective medium.

In our series culture proved to be greatly superior to the examination of smears from the anal canal and rectum stained by Gram's method. All 32 were positive by culture but only ten were positive by smear. This is no doubt due to improved cultural techniques and to the difficulty of reading grossly contaminated rectal slides.

It is also worth noting that four patients (5.6 per cent. of the total yielding positive results and 3.7 per cent. of the total number examined) were diagnosed

solely by tests from anorectal sites. This figure matches the average for recent reports (*e.g.* Olsen, 1971). Pariser's figure of 20 per cent. of the positive cases is high in this respect, but he did not take urethral specimens.

That the rectum may be a site of asymptomatic gonorrhoea is abundantly proved in this series as in others. No patient had any symptom referable to the rectum and only seven of 32 showed any muco-pus or congestion in the rectum. Not one positive case was diagnosed solely on the anal canal specimen. In other words, whenever anal canal specimens were positive, samples from some other site also proved to be positive. This suggests that rectal specimens taken under direct vision are preferable to anal canal samples taken blindly.

In our series, only 44 per cent. of the patients with rectal or anal infection admitted peno-rectal or peno-anal contact, compared with Pariser's figure of 75 per cent., but it is likely that many patients acquire the infection through rectal intercourse rather than as an extension from urogenital gonorrhoea. In our series, as in Pariser's, patients readily supplied the information concerning their sexual habits when the interviewer showed no embarrassment or inhibition in putting the necessary questions.

### Summary and conclusions

- (1) 107 women who were named contacts of men with gonorrhoea were tested for infection. Smear and culture specimens from urethra, endocervix, anal canal, and rectum were examined. The smears were stained by Gram's method and examined immediately. Swabs for culture were placed in Stuart's transport medium and later inoculated on to both selective and non-selective media.
- (2) It was shown that 45 per cent. of the positive cases had anorectal involvement, and that 5.6 per cent. had anorectal gonorrhoea only.
- (3) Cultures made on trimethoprim-containing selective medium were vastly superior to smears in specimens from the anorectal region and yielded 188 per cent. more positives than did those made on conventional media.
- (4) Anal canal specimens did not improve the yield in our series and are probably unnecessary if urethral, endocervical, and rectal specimens are taken.
- (5) All the cases of rectal involvement in the present series proved to be symptomless; seven had signs of proctitis.
- (6) It is concluded that examination of rectal specimens should be part of the routine for the diagnosis of gonorrhoea in named female contacts.

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**Diagnostic de la gonococcie chez la femme. Rôle de prélèvement rectal**

## SOMMAIRE

- (1) 107 femmes désignées comme contacts d'hommes atteints de gonococcie furent examinées pour savoir si elles étaient infectées. On a examiné par lame et culture des spécimens provenant de l'urètre, de la cavité cervicale, du canal anal et du rectum. Les lames étaient colorées au Gram et examinées immédiatement. Les écouvillons pour la culture étaient introduits dans le milieu de transport de Stuart et inoculés immédiatement à la fois sur un milieu sélectif et sur un milieu non sélectif.
- (2) On constata que 45 pour cent des cas positifs avaient une infection ano-rectale et que 5,6 pour cent n'avaient qu'une gonococcie ano-rectale.
- (3) Les cultures faites sur un milieu sélectif à la triméthoprime étaient de loin supérieures à l'examen sur lame pour les spécimens de la région ano-rectale et se montrèrent 188 pour cent plus positives que les cultures pratiquées sur les milieux conventionnels.
- (4) Les spécimens provenant du canal anal n'améliorèrent pas le résultat dans notre série et sont probablement inutiles si l'on a pris des spécimens de l'urètre, de la cavité cervicale et du rectum.
- (5) Dans la présente série, l'infection rectale se montra asymptomatique dans tous les cas; 7 avaient des signes de rectites.
- (6) On en conclut que l'examen des spécimens rectaux doit faire partie de la routine pour le diagnostic de la gonococcie chez les femmes désignées comme contact.