

SOME OBSERVATIONS ON THE DIAGNOSIS OF RECTAL GONORRHOEA IN BOTH SEXES USING A SELECTIVE CULTURE MEDIUM*†

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The lack of a satisfactory medium for the isolation of *Neisseria gonorrhoeae* from rectal cultures has been one of the main difficulties in diagnosing rectal gonorrhoea. Because of the overgrowth of gonococcal colonies by intestinal organisms in rectal cultures on conventional media, direct examination of Gram-stained rectal smears has been used as the principal method of diagnosis. This method is not reliable, as gonococci are easily overlooked and other Gram-negative intracellular organisms, such as *Mimeae*, may occasionally be mistaken for them. As a proportion of new cases of gonorrhoea occurs in male passive homosexuals the need for a more certain method of diagnosis is obvious.

Thayer and Martin (1964) described the use of a selective medium which allowed the growth of gonococci but suppressed the growth of intestinal organisms, and which seemed to offer a distinct advantage in the diagnosis of rectal gonorrhoea. Wilkinson (1965), who used the medium for the culture of gonococci from genital and rectal specimens, confirmed its advantages in isolating gonococci from the rectum.

This paper describes the use of a modified form of this medium to diagnose rectal gonorrhoea in male passive homosexuals and female patients known to be gonorrhoea contacts, and suggests that better diagnostic methods may show that rectal gonorrhoea in the female is more prevalent than previously suspected.

Methods

This study was carried out on 186 gonorrhoea contacts, 104 females and 82 male passive homosexuals, attending the Lydia Department, St. Thomas' Hospital. All patients were seen initially for diagnosis when rectal

smears and cultures were made. In female patients urethral and cervical smears and cultures were also taken. If gonococci were seen in the smears, the patient was treated with procaine penicillin 600,000 units intramuscularly. If the smears were negative the patient was asked to return 24 hours later when the tests were repeated, and if the results were still negative the patient was seen again after a further 24 hours when the results of the cultures were available. All patients receiving treatment were asked to attend the following day when the tests were repeated.

In both sexes the specimens were taken through a proctoscope, in women a sterile platinum loop was used for the smear and a sterile cotton wool swab for the culture specimen, in men a platinum loop was used for both specimens. The smears were fixed immediately, stained by Gram's method, and examined microscopically. The cultures were made on the selective medium and were examined after 48 hours incubation at 37°C., the first 24 hours being in an atmosphere of 5 per cent. carbon dioxide. Gonococci were identified on the basis of their colonial and microscopical appearances initially, and were confirmed by a positive oxidase reaction and sugar fermentation reaction.

The medium described by Thayer and Martin (1964) incorporated two antibiotics with a synergistic action, Polymyxin B 25 units/ml. and Ristocetin 10 µg./ml. in a chocolate agar base. In this study a modification of this medium was used, employing a nutrient agar with 10 per cent. hydrocoele fluid as a base and only 10 units/ml. Polymyxin B. It was found that this modified medium supported a more profuse growth of gonococci whilst still inhibiting the growth of gut organisms.

Results

Tables I to III summarize the results for males and females separately, each group being divided into pre-treatment and post-treatment series. The latter is smaller than the former as a proportion of the patients failed to attend for post-treatment tests. Any patients who attended for post-treatment tests but admitted further sexual intercourse in the

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interval were excluded from the post-treatment series.

The following points seem to be worthy of comment:

Female

(Pre-treatment) Tables I and II.—Of the 104 patients concerned, 74 (71 per cent.) were found to have gonorrhoea, as judged by positive uro-genital or rectal smears or cultures, 31 (28 per cent.) had both genital and rectal gonorrhoea, and three (3 per cent.) had rectal disease only. In considering the method of diagnosis (Table II), it will be seen that, of the 31 patients with rectal gonorrhoea, sixteen (51 per cent.) had a positive smear but 26 (87 per cent.) had a positive culture. In fifteen (49 per cent.) cases, the diagnosis was made by means of a positive culture only. All three patients with rectal disease only had positive rectal cultures and only one had a positive smear. Had diagnosis depended on rectal smears alone, two of these cases would have been missed.

TABLE I
ANALYSIS OF FEMALE GONORRHOEA CONTACTS

Time of Test	At Diagnosis		Post-Treatment	
	No.	Per cent.	No.	Per cent.
Total Cases	104		38	
Gonorrhoea	74	71	14	37
Rectal Gonorrhoea . .	31	28	10	26
Genital Gonorrhoea . .	71	68	9	24
Rectal Disease Only . .	3	3	5	13

TABLE II
METHODS OF DIAGNOSIS OF FEMALE GONORRHOEA CASES

Time of Test	At Diagnosis		Post-Treatment		Total	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
Total Cases with Rectal Gonorrhoea	31		10		41	
Positive Smear	16	51	4	40	20	49
Positive Culture	26	87	7	70	33	78
Positive Smear Only . .	5	16	3	30	8	19
Positive Culture Only . .	15	49	6	60	21	51
Positive Smear and Culture	11	35	1	10	12	29

(Post-treatment) Tables I and II.—Of the 38 patients in this series, fourteen (37 per cent.) had gonorrhoea. All these patients denied further sexual activity and are regarded as having relapsed. Of these fourteen patients, ten had rectal gonorrhoea; five of these also had genital disease but the

other five had rectal disease only. Of these ten cases, the cultures alone were positive in six, one had both culture and smear positive, and the remaining three had positive smears only. Four out of the five patients with rectal disease alone had a positive culture and two had a positive smear.

Taking both these series together, it will be noticed that, of the 41 cases of rectal gonorrhoea, twenty (49 per cent.) would have been diagnosed by rectal smear, whereas 33 (81 per cent.) would have been diagnosed by rectal cultures. In only eight cases did gonococci fail to grow in culture after they had been seen in the Gram film.

Male

(Pre- and Post-treatment) Table III.—36 (44 per cent.) out of a total of 82 contacts were found to have rectal gonorrhoea; 28 (77 per cent.) of these had a positive smear, and 23 (65 per cent.) had a positive culture. Of thirty patients who attended for post-treatment, thirteen (43 per cent.) had relapsed, twelve having positive smears and seven positive cultures.

Taking both these series together, it will be seen that, of the 49 cases with rectal gonorrhoea, forty (85 per cent.) had a positive rectal smear but only thirty (60 per cent.) had positive cultures. In contrast to the female series, cultures failed to confirm the presence of gonococci seen in the Gram film in nineteen cases in the male series.

TABLE III
ANALYSIS OF MALE GONORRHOEA CONTACTS

Time of Test	At Diagnosis		Post-Treatment		Total	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
Total Patients	82		30		112	
Total with Rectal Gonorrhoea . .	36	44	13	43	49	43
Positive Smear	28	77	12	93	40	85
Positive Culture	23	65	7	54	30	60
Positive Smear Only . . .	13	36	6	46	19	41
Positive Culture Only . . .	8	22	1	8	9	15
Positive Smear and Culture	15	42	6	46	21	44

Discussion

These results seem to confirm earlier impressions that selective media offer a real advantage in the diagnosis of rectal gonorrhoea. In this department the isolation of gonococci from rectal swabs cultured on conventional media was considered to be so unreliable that it was abandoned as a routine procedure. Yet in this series there were 63 positive rectal cultures compared with sixty positive rectal

smears, and in thirty cases the rectal culture only was positive. Although the numbers are small and not strictly comparable, there does appear to be a significant difference between the number of positive cultures found in men and women. The most likely cause for this difference is the technique used to take the specimen for rectal culture, namely a platinum loop in men and a cotton wool swab in women. It is probable that this resulted in a smaller inoculum in men, as the procedures are otherwise identical.

These results confirm that there is a high incidence of gonorrhoea amongst both male and female contacts, but, more important, they also suggest that rectal gonorrhoea occurs more often amongst female contacts than was previously suspected. Jensen (1953) found that 31 per cent. of females with uro-genital gonorrhoea had rectal disease also, whereas in this series 31 out of 74 pre-treatment cases (42 per cent.) had rectal disease.

Neither the route by which gonococci reach the rectum nor their significance there is altogether clear. Jensen (1953) suggested that anal intercourse is the predominant cause, but we found little evidence to support this. There is little to suggest that spread from the uro-genital organs *via* the pelvic lymphatics is important, and it is proposed that the major route is by perineal spread and retrograde passage into the rectum. Once in the rectum it is possible that the organisms may be more resistant to the action of systemic penicillin, as the concentration of penicillin in the rectum is not high, and its action may be impaired by the penicillinase produced by some gut organisms which would outnumber gonococci. That this may be the case is further supported by the relatively high relapse rate in both male and female patients in this series; 37 per cent. of the post-treatment females and 43 per cent. of the post-treatment males still had demonstrable gonococci after routine treatment. In none of these cases was the gonococcus resistant to penicillin and, although the possibility of further intercourse cannot be absolutely excluded, the finding indicates that the initial treatment had been inadequate. Although the numbers concerned are small, it is suggestive that, of the fourteen post-treatment females found to have persistent gonorrhoea, ten (71 per cent.) should have rectal gonorrhoea. Whether gonococci from the rectum re-infect the genital organs is not certain, but their presence there constitutes a source of danger. Further work is needed to confirm these suppositions, but if they are correct then a larger dose of penicillin should be used to treat rectal gonorrhoea. On this assumption, in this department, we are now using a dose of 2·5 megaunits of Triplopen (Glaxo), and our initial

impression is that with this dose the relapse rate is negligible.

It is not standard practice in all venereal disease departments to take rectal smears and cultures from female contacts, but these results suggest that these procedures should be performed routinely on all new cases, and also on all patients with rectal gonorrhoea attending for post-treatment tests.

Further work on the composition of the selective medium is also indicated. We have found the medium described in this paper more effective than that originally described by Thayer and Martin. The use of hydrocoele agar rather than chocolate agar may account for this.

Summary

- (1) Rectal smears and cultures were taken from 186 known gonorrhoea contacts.
- (2) The rectal cultures were made on a selective medium, based on that described by Thayer and Martin (1964), incorporating Polymyxin B 10 units per ml. and Ristocetin 10 μ g. per ml. in a hydrocoele agar base.
- (3) There were more positive rectal cultures than positive rectal smears in the female patients (33 compared with 22), but fewer in male patients (30 compared with 40). It is suggested that the different technique of collecting specimens may account for this difference.
- (4) The high incidence of rectal gonorrhoea in the female (42 per cent. of pre-treatment cases) is noted.
- (5) The high relapse rate (71 per cent. of females post-treatment) suggests that rectal gonorrhoea requires a larger dose of penicillin for adequate treatment than urogenital gonorrhoea. A dose of 2·5 megaunits Triplopen is recommended.

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Quelques observations au sujet du diagnostic de la blennorrhagie rectale chez les deux sexes en se servant d'un milieu de culture sélectif

RÉSUMÉ

- (1) Des frottis rectaux et des cultures ont été pris de 186 contacts de blennorrhagie connus.
- (2) Les cultures rectales ont été faites sur un milieu sélectif basé sur celui décrit par Thayer et Martin (1964), et incorporant 10 unités de Polymyxine B par c.c. et 10 μ g. de Ristocétine par c.c. dans une base d'agar d'hydrocèle.
- (3) Il y avait plus de cultures positives rectales que de frottis positifs rectaux chez les femmes (33 comparées à 22), mais moins chez les hommes (30 comparées à 40). On suggère que les différentes techniques de prélèvement des échantillons pourraient causer cette différence.
- (4) Une forte incidence de blennorrhagie rectale chez la femme (42 pour cent des cas non traités) est notée.
- (5) Le taux élevé des rechutes (71 pour cent des femmes traitées) suggère qu'une plus forte dose de pénicilline est nécessaire pour le traitement adéquat de la blennorrhagie rectale que pour la blennorrhagie uro-génitale. Une dose de 2,5 méga unités de Triplopène est recommandée.