Gonococcal salpingitis in gynaecology—Myth or missed?

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Summary
A series of 25 cases of gonococcal salpingitis were seen in a teaching hospital between October, 1972, and March, 1975. These cases formed 29 per cent. of all cases of salpingitis excluding post-abortal cases. The majority were investigated at the bedside by taking films and cultures from the cervix and urethra. The films were stained by Gram’s method and specimens for culture were streaked on to pre-warmed Gonococcal Selective Medium (Oxoid) and the plates were incubated at once in a CO₂-enriched atmosphere at 37°C. A group of cases was identified with minimal symptoms and minimal, or absent, signs; in such cases the diagnosis may be unsuspected. Reasons are advanced for the failure of other gynaecological units to recognize gonococcal salpingitis.

Introduction
Interest in the occurrence of gonorrhoea in obstetric and gynaecological patients was stimulated several years ago by high figures reported from North America. In obstetric patients, Kraus and Yen (1968) found 5·7 per cent. (75 out of 1,309 patients); Sarrel and Pruett (1968) 6 per cent. (numbers not stated); Waters and Roulston (1968) 2·5 per cent. (89 out of 3,375); Cave, Bloomfield, Hurdle, Gordon, and Hammock (1969) 5·5 per cent. (25 out of 452); Charles, Cohen, Kass, and Richman (1970) 7·3 per cent. (158 out of 2,160); Corman, Levison, Knight, Carrington, and Kaye (1974) 4 per cent. (31 out of 723). In gynaecology patients, Cave and others (1969) found 11·1 per cent. (47 out of 423).

In surveys by British authors lower figures were reported. In obstetric patients, Thin and Michael (1970) found none (out of 56 patients); Rees and Hamlett (1972) 0·6 per cent. (2 out of 319); Cassie and Stevenson (1973) 0·2 per cent. (2 out of 1,000); Silverstone, Snodgrass, and Wigfield (1974) none (out of 311); Sparks, Williams, Boyce, Fitzgerald, and Shelley (1975) 0·16 per cent. (1 out of 625). In gynaecology patients, Driscoll, McCoy, Nicol, and Barrow (1970) found 2·9 per cent (1 out of 34); Hughes and Davies (1971) 0·3 per cent (3 out of 1,000); Silverstone and others (1974) 1·7 per cent (1 out of 59).

From the low British figures, it is concluded that routine screening of all patients for gonorrhoea is not justified but that patients 'at risk' should be investigated (Sparks and others, 1975). Sparks (1974) retrospectively observed ten cases of bacteriologically proven gonococcal salpingitis in gynaecological emergencies in a teaching hospital over a period of 6½ months.

That report stimulated a closer search of the records of patients at Llandough Hospital and a review of the cases of gonococcal salpingitis which were discovered forms the basis of this study. October, 1972, was taken as the starting point as it marked the beginning of a policy of taking cervical and urethral samples at the bedside for Gram-staining and direct plating on to pre-warmed Oxoid Gonococcal Selective Medium. The plates were immediately incubated in a CO₂-enriched atmosphere at 37°C.

Findings
In the 2 years and 4 months from October, 1972, to March, 1975, 25 cases of bacteriologically established gonococcal salpingitis were found. Seventeen occurred since January, 1974, and 22 were admitted as emergencies; six of the latter were admitted under the general surgeons.

With one exception none of the patients had received antibiotics before admission. The exception was a patient in whom relapse had occurred after the treatment of uncomplicated gonorrhoea.
Of the 25 patients, 75 per cent. were over 20 years of age (Table I), the highest incidence being seen in those over 25 years of age. 32 per cent. were married, and over 50 per cent. of the single women had had pregnancies (Table II). Several patients had had termination of pregnancy.

**TABLE I** Gonococcal salpingitis and incidence of postpubertal gonorrhoea in women, by age group

<table>
<thead>
<tr>
<th>Age group (yrs)</th>
<th>No. of cases of gonococcal salpingitis</th>
<th>Incidence of postpubertal gonorrhoea in women per 100,000 population in 1973*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 16</td>
<td>nil</td>
<td>8-90</td>
</tr>
<tr>
<td>16-17</td>
<td>2</td>
<td>405-56</td>
</tr>
<tr>
<td>18-19</td>
<td>4</td>
<td>664-28</td>
</tr>
<tr>
<td>20-24</td>
<td>8</td>
<td>450-75</td>
</tr>
<tr>
<td>25 and over</td>
<td>11</td>
<td>41-61</td>
</tr>
</tbody>
</table>

*Chief Medical Officer (1975)

**TABLE II** Marital status and previous pregnancies and terminations in a series of 25 patients

<table>
<thead>
<tr>
<th>Marital status</th>
<th>No. of patients with previous pregnancies including terminations</th>
<th>No. of patients with terminations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Married</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Separated</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Divorced</td>
<td>1</td>
<td>nil</td>
</tr>
</tbody>
</table>

The abdominal pain had developed within 14 days of the onset of the last menstrual period in 95 per cent. of cases in which the date of the last menstrual period was known. A purulent or increased vaginal discharge was noted in 14 cases (56 per cent.) and in six (43 per cent.) of them *Trichomonas vaginalis* was isolated.

Twelve patients had dysuria, but some confused dysuria and abdominal pain exacerbated by micturition.

Only eight patients (32 per cent.) were using adequate contraception. Two were taking oral contraceptives and nineteen were not—two of these had been sterilized and four had an intrauterine contraceptive device (IUCD). No Gravigard device, the copper content of which may have an antigonococcal action (Cohen and Thomas, 1974), was known to be involved.

All patients complained of lower abdominal pain and this was the principal symptom in 24 cases. Tenderness on vaginal examination was reported by 21 patients, but two of these had no abdominal tenderness. Three other patients (described below) had no pelvic or abdominal tenderness and one had tenderness only in the right iliac fossa.

The range of temperature, erythrocyte sedimentation rate, and white blood count are given in Table III. In a group of seven patients, there was a comment in the notes indicating gross clinical signs.

The values were more often raised in them than in a group of five patients in whom the notes indicated minimal clinical findings. In both groups, the temperature was above 37·6°C. in 50 per cent., the erythrocyte sedimentation rate above 15 mm. 1st hr in 75 per cent., and the white blood count above 10,000 per mm³ in 60 per cent.

**TABLE III** Ranges of temperature, erythrocyte sedimentation rate, and white blood count in certain clinical groups

<table>
<thead>
<tr>
<th>Cases</th>
<th>Temperature (°C.)</th>
<th>Erythrocyte sedimentation rate (mm./1st hr)</th>
<th>White blood count (per mm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>36-8-39·2</td>
<td>4-90</td>
<td>4,500-26,400</td>
</tr>
<tr>
<td>With gross signs</td>
<td>37·8-38·8</td>
<td>12-55</td>
<td>7,200-26,400</td>
</tr>
<tr>
<td>With minimal signs</td>
<td>36·8-39·2</td>
<td>12-77</td>
<td>8,000-22,000</td>
</tr>
</tbody>
</table>

The results of cervical cultures and Gram-stained films are given in Table IV for 22 of the 25 patients. Cultures gave more positive results than the Gram-stained films of which nearly half were negative, but in three cases only the Gram-stained films were positive. As it was not possible to separate urethral results in many cases, they have been ignored. In the other three cases gonococci were cultured from a high vaginal swab (in two) and from pus collected at laparotomy (in one).

**TABLE IV** Comparison of cervical cultures and Gram-stained films

<table>
<thead>
<tr>
<th>Gram-stained film</th>
<th>Culture</th>
<th>Positive</th>
<th>Negative</th>
<th>Not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>10</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

In nine cases with a positive cervical culture, a charcoal-coated swab from the cervical canal was also taken in Stuart's transport medium, but only five showed gonococci on culture.

**Special cases**

Three patients, two of whom had no abdominal or pelvic findings, deserve special attention.

**Case 1**, a 23-year-old married woman, presented at the outpatient department requesting termination of pregnancy in view of having previously had a spina bifida baby. She had had 12 weeks amenorrhoea with an episode of lower abdominal pain and vaginal bleeding which was considered to be a threatened abortion in view of a positive pregnancy test. There was no abdominal or pelvic tenderness but a mass compatible with a 12-week pregnancy was present. The white blood count was normal.
When she was examined under anaesthesia, the presence of a pelvic mass was confirmed but the uterine cavity was of normal size with apparently normal curettings. Laparotomy revealed a right-sided tubo-ovarian mass adherent to the back of the uterus. Pus from the mass showed Gram-negative intracellular diplococci and *Neisseria gonorrhoeae* was cultured. Histology of both tubes showed subacute inflammation and no evidence of ectopic pregnancy. The endometrium was consistent with anovulatory cycles. In retrospect, the 'threatened abortion' was the patient's last menstrual period.

**Case 2**, a 23-year-old separated woman, was seen at the outpatient department with lower abdominal pain, pain on micturition, and heavy frequent periods. There were no abnormal abdominal or pelvic findings. The white blood count and erythrocyte sedimentation rate were normal.

No abnormal findings were noted on dilatation and curettage, but films and cultures from the cervix gave positive results. Despite the absence of clinical findings, the presence of lower abdominal pain, positive culture results, and rapid response to penicillin supported the diagnosis of salpingitis.

**Case 3**, a 19-year-old single girl, was admitted as an emergency with right iliac fossa pain, pyrexia, and an erythrocyte sedimentation rate of 88 mm. 1st hr, but with a normal white blood count. Abdominal and pelvic findings were normal but films and cultures from the cervix were positive. Again the response to penicillin supported the diagnosis of salpingitis.

**Discussion**

Routine screening for the isolation of gonococci from gynaecological patients in Gt Britain has been unrewarding. Driscoll and others (1970) found one case of gonorrhoea in 34 patients with a vaginal discharge. Hughes and Davies (1971) found three cases in 1,000 patients not suspected of having gonorrhoea although one had a Bartholin's abscess, the gonococcal aetiology of which should have been suspected. Silverstone and others (1974) found one case in 41 outpatients but none in eighteen patients admitted to hospital with acute gynaecological symptoms.

It is apparent that two types of early gonococcal salpingitis can be recognized—acute and subacute (Rees and Annels, 1969). The former present with the usual symptoms and signs whereas the latter have slight symptoms and sometimes no signs although all the cases described by Rees and Annels (1969) showed abnormal signs. Temperature, white blood count, and erythrocyte sedimentation rate may be raised in those cases with minimal or absent signs. It is therefore important to remember that salpingitis may be present with only slight clinical features. These are the cases in which the diagnosis of gonococcal salpingitis may not be considered, and damage to the Fallopian tubes may continue unchecked.

Six of the cases under review were admitted to hospital by general surgeons and, although the symptoms were severe enough for the diagnosis of acute salpingitis to be considered and bacteriological investigations undertaken, one patient was sent home because her symptoms rapidly settled, and the positive culture results were received afterwards. The disappearance of abdominal pain in cases of gonococcal salpingitis with rest in bed has been noted before (Rees and Annels, 1969). Most cases of subacute salpingitis are probably admitted to surgical wards with a diagnosis of possible appendicitis or urinary tract infection and are never adequately investigated.

Gonococcal salpingitis is rarely established bacteriologically in gynaecological departments (McGarry, 1975; McLean, 1975; Suter, 1975—personal communications). Between October, 1972, and January, 1975, we found 22 cases of this condition, and the same number was recorded by the Hospital Inpatient Analysis, which gave 75 cases of salpingitis for the same period, an incidence of 29 per cent. If patients already receiving antibiotics at the time of admission were excluded, the percentage would be higher. We may ask why this is not the experience in other units? With the doubling of cases of postpubertal gonorrhoea notified in females from 9,456 in 1966 to 20,754 in 1973 (Chief Medical Officer, 1968, 1975), cases of gonococcal salpingitis must be passing through the gynaecological units of Gt Britain. Indeed, Rees and Annels (1969) noted that gonorrhoea is more likely to be complicated by salpingitis than before, for an incidence of 3:3 per cent. in 1957 had risen to 10:6 per cent. between 1963 and 1966.

Several reasons can be advanced for poor gonococcal isolation rates. Many patients receive antibiotics from their general practitioner—a matter to be deprecated as it interferes with the bacteriological investigation. Gynaecologists rely on Stuart's Transport Medium but, our figures, though small, suggest that direct plating is more effective. Taking specimens with swabs from the urethra is painful and it may be difficult to obtain adequate samples from the cervical canal. Presterilized plastic disposable loops or platinum loops are easier to use. Samples taken from the vagina for gonococcal culture are unsatisfactory with many false negative results (Bhattacharyya, Jephcott, and Morton, 1973). It should also be noted that the lubricant on the speculum may kill gonococci (Penza and Rankin, 1970).

Specimens from the cervical canal may not be appropriate for diagnosing infection in the uterine tubes. Gonococci gain access during menstruation but disappear from the uterus with the endometrial shedding. The tubal infection may be localized to the fimbriated end and the isthmus may be blocked by adhesions. No pus will then reach the cervix from the tubes and, if the original cervical infection is subsiding, the inoculum may be barely sufficient to grow on direct plating on Selective Medium.

On theoretical grounds, the ideal is to take samples directly from the tubes. However, Márđh and...
Weström (1970) found gonococci in the tubes of only 4 per cent. of cases of acute salpingitis on laparoscopy; in contrast cervical samples were positive in 34 per cent. Jacobson and Weström (1969) demonstrated the value of laparoscopy by reporting 91 patients in whom salpingitis was an unexpected finding. Abdominal pain had not been recorded in 38 of these and no pelvic tenderness was found in fifty (55 per cent). Conversely, Kenney and Greenhalf (1974) reported two cases with normal tubes on laparoscopy and subsequent laparotomy, in which massage of the tubes produced pus from which gonococci were cultured. Rees and Annels (1969) postulated that in most cases the visual findings would be normal as the infection would be limited to the mucosa.

Finally, it is worth noting that nearly half our patients were aged 25 years or over. This contrasts with the report that the highest incidence of postpubertal gonorrhoea in women occurred in girls aged 18 and 19 years (Chief Medical Officer, 1975).

We should like to thank Miss J. Andrews, Dr L. Cohen, and the late Mr R. C. Cummin for advice and permission to review the patients under their care.

References
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——-, Williams, G. L., Boyce, J. M. H., Fitzgerald,