INVESTIGATION OF NON-GONOCOCCAL URETHRITIS BY
ANAEROBIC CULTURE*

BY

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Since 1951, when the numbers of cases of non-
gonococcal urethritis (N.G.U.) were first recorded
separately by clinics in England and Wales, the
incidence of the disease has risen steadily. Like
gonorrhoea in males, the annual number of cases
has doubled in a decade (Table 1), but the causal
organism remains unknown and treatment suffers
thereby from empiricism.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>14,975</td>
<td>10,659</td>
<td>1:40 :1</td>
</tr>
<tr>
<td>1952</td>
<td>15,499</td>
<td>11,450</td>
<td>1:35 :1</td>
</tr>
<tr>
<td>1953</td>
<td>15,258</td>
<td>13,095</td>
<td>1:16 :1</td>
</tr>
<tr>
<td>1954</td>
<td>13,958</td>
<td>13,250</td>
<td>1:05 :1</td>
</tr>
<tr>
<td>1955</td>
<td>14,008</td>
<td>14,122</td>
<td>1:1:008</td>
</tr>
<tr>
<td>1956</td>
<td>12,324</td>
<td>14,756</td>
<td>1:11:1</td>
</tr>
<tr>
<td>1957</td>
<td>19,615</td>
<td>16,057</td>
<td>1:22:1</td>
</tr>
<tr>
<td>1958</td>
<td>22,407</td>
<td>13,336</td>
<td>1:65:1</td>
</tr>
<tr>
<td>1959</td>
<td>24,946</td>
<td>20,229</td>
<td>1:23 :1</td>
</tr>
<tr>
<td>1960</td>
<td>28,308</td>
<td>21,719</td>
<td>1:30 :1</td>
</tr>
<tr>
<td>1961</td>
<td>29,500</td>
<td>24,290</td>
<td>1:21 :1</td>
</tr>
</tbody>
</table>

* Completed from quarterly returns to the Ministry of Health for
  England and Wales.

Gordon (1943) stated that all cases of urethritis
were gonococcal in origin. Mast (1948) thought
N.G.U. was a new disease. Viewing the subject from
a historical standpoint, Harkness (1950) quoted
Luys (1922) to the effect that Aretaeus of Cappa-
docia in the 1st century A.D. had distinguished
between spermatorrhoea and pathological dis-
charges and had recognized a thick white discharge
from acute cystitis. A host of British clinicians in
the last 200 years, including Neale (1756), Brodie (1818),
Stevenson (1823), Abernethy (1826), Parker (1839),
Carmichael (1842), and Dawson (1848), have all
claimed that gonorrhoea was not the sole cause
of urethritis. Not till the end of the 19th century, how-
ever, was it suggested that a urethral discharge could
be abacterial: Guiard (1897) and Barlow (1899)
found no organism but still considered the condition
to be contagious. Waelsch (1904) was the first to
describe N.G.U. in detail; he found few organisms in
smears and his cultures were mostly sterile.

Since Lindnér (1910) first described elementary
bodies in the urethral discharge, various attempts
have been made to prove a viral aetiology in N.G.U.,
but these efforts have so far proved unsuccessful.

Nicol and Edward (1953) and Klieneberger-Nobel
(1945) tried to incriminate the pleuroneumonia-like
organisms but failed to prove a case.

Willcox (1954) concluded that bacterial urethritis
was not common. Wilkinson (1959) pointed out that
anaerobic culture studies of N.G.U. have been few; one
example is the United States Army study at Camp
Kilner, but the results were obtained from a few
cases only and differed little from cultures made
from controls. Stokes (1958) showed that infective
anaerobes occurred in 31.5 per cent. of 220 cultures,
and her work prompted a further study of the cause
of N.G.U. from the anaerobic standpoint.

Six groups of organisms may be cultured anaer-
obically (Docum. Geigy (Basel), 1963):

(1) Pleuroneumonia-like organisms (P.P.L.O.).
(2) Veillonella
(3) Neisseria reniformis
(4) Anaerobic Streptococci and Staphylococci
   (a) Staph. aerogenes
   (b) Gaffkya anaerobia
   (c) Strept. equinimilis
   (d) Strept. anaerobius
   (e) Strept. evolutus
   (f) Strept. liqifaciens
   (g) Parvo bactericeae
      (i) Mima polymorphe
      (ii) Herelles vaginicolata
      (iii) Colloidesanoxydiana
(5) Fusiformis
(6) Bacteroides
(7) Leptotrichia

* Received for publication July 21, 1962.
INVESTIGATION OF N.G.U. BY ANAEROBIC CULTURE

Fusiformis and Bacteroides are associated with ulcers and abscess formation and were thus excluded from the study on clinical grounds. Leptotrichia is the former name of a genus of bacterial organisms no longer recognized as a genus. It is classified as shown and is excluded as a possible cause of N.G.U.

The causal organism, if an anaerobic bacterium, should therefore, belong to one of the first three groups. The report of an investigation on these lines has been noted (Stokes, 1958), and P.P.L.O. have been excluded from special study as they have been studied elsewhere in detail (vide supra).

Veillonella are Gram-negative cocci and grow readily on ordinary media under anaerobic conditions. They are found in the upper respiratory and alimentary tracts as commensals and doubtful pathogens.

Material

Of the 81 men studied in the clinics at Sheffield, Barnsley, Doncaster, and Rotherham, 73 were born in the United Kingdom, and eight were coloured immigrants. Their ages ranged from 17½ to 64 years (average 32·4). 44 were married, or married and separated, and 37 were single or widowed; of the 44 married men, fourteen admitted extramarital exposure. Ten female contacts were also studied.

Method

Urethral specimens were taken from each patient at the first attendance to exclude N. gonorrhoeae and Trichomonas vaginalis. Specimens were also taken on charcoal-impregnated swabs and sent in Stuart’s medium for culture of the gonococcus and T. vaginalis and for anaerobic incubation for 5 days.

Findings

98 specimens were examined, 85 cultures from the 81 men and thirteen specimens from the ten females being sent for anaerobic culture. Specimens were taken from the urethra, cervix, and vagina of the ten women.

The findings may be tabulated as follows:

<table>
<thead>
<tr>
<th>Organism</th>
<th>White</th>
<th>Coloured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staph. albus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strept. anaerobius and Diphtheroids</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Diphtheroids</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Strept. faecalis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>B. coli.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Strept. hemolyticus</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Strept. haemolyticus</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>No significant growth</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Culture not received</td>
<td>98</td>
<td>99</td>
</tr>
</tbody>
</table>

Thus commensals and contaminants were found in 21·7 per cent., and no significant growth in 78·73 per cent. There were no parallel findings in those couples in whose cultures anaerobic growth occurred.

Discussion

An anaerobic culture of the urethral discharge in 81 cases of N.G.U. did not yield any information regarding a bacterial cause of the disease nor did the study suggest one.

One point of interest was the G.C./N.G.U. ratios. Table II shows how these compare with the findings for England and Wales as a whole for the years 1958–61.

The total of white and coloured patients and the percentage of each is given in Table III.

Table II

<table>
<thead>
<tr>
<th>Year</th>
<th>National Ratio</th>
<th>Sheffield White</th>
<th>Coloured</th>
<th>Rotherham White</th>
<th>Coloured</th>
<th>Doncaster White</th>
<th>Coloured</th>
<th>Barnsley White</th>
<th>Coloured</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>1·65 : 1</td>
<td>1·01 : 45</td>
<td>2·42 : 1</td>
<td>1·01 : 50</td>
<td>1·01 : 57</td>
<td>—</td>
<td>—</td>
<td>1·01 : 52</td>
<td>—</td>
</tr>
<tr>
<td>1959</td>
<td>1·23 : 1</td>
<td>1·01 : 98</td>
<td>3·52 : 1</td>
<td>1·01 : 72</td>
<td>1·01 : 38</td>
<td>—</td>
<td>—</td>
<td>1·01 : 28</td>
<td>—</td>
</tr>
<tr>
<td>1960</td>
<td>1·30 : 1</td>
<td>1·01 : 08</td>
<td>3·36 : 1</td>
<td>1·01 : 20</td>
<td>1·01 : 90</td>
<td>1·05 : 1</td>
<td>2·61 : 1</td>
<td>1·01 : 84</td>
<td>—</td>
</tr>
<tr>
<td>1961</td>
<td>1·12 : 1</td>
<td>1·01 : 55</td>
<td>4·08 : 1</td>
<td>1·01 : 02</td>
<td>1·01 : 12</td>
<td>0·52 : 1</td>
<td>1·36 : 1</td>
<td>1·01 : 95</td>
<td>—</td>
</tr>
</tbody>
</table>

Table III

<table>
<thead>
<tr>
<th>Race</th>
<th>No. of Cases</th>
<th>N.G.U. as Percentage of Total by Race</th>
<th>N.G.U. as Percentage of Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gonorrhoea</td>
<td>N.G.U.</td>
<td>Total</td>
</tr>
<tr>
<td>White</td>
<td>743</td>
<td>831</td>
<td>1,574</td>
</tr>
<tr>
<td>Coloured</td>
<td>646</td>
<td>194</td>
<td>840</td>
</tr>
<tr>
<td>Total</td>
<td>1,389</td>
<td>1,025</td>
<td>2,414</td>
</tr>
</tbody>
</table>
The higher incidence of the disease in men born in the United Kingdom is noteworthy, though it may be that the more promiscuous coloured patient is running a greater risk of contracting gonorrhoea when there is a higher incidence of this disease.

Summary

(1) 98 specimens, 85 of them from 81 males with non-gonococcal urethritis and thirteen from ten female consorts were cultured anaerobically for 5 days: 78.73 per cent. showed no significant growth, and in 21.27 per cent. commensal contaminant organisms were grown.

(2) There was no correlation between the cultures taken from the consorts.

(3) N.G.U. was more than twice as common among white patients (52.7 per cent.) as among coloured men (23.09 per cent).

(4) An anaerobic organism was not found to be a factor in, or a cause of, N.G.U.

(5) Further investigation of the origin of this condition is indicated.

I thank Dr. R. S. Morton, Consultant Venereologist, for his help in preparing this paper, and Dr. A. L. Hilton, who suggested this line of investigation and supplied details of patients in his care at the Rotherham and Doncaster clinics. Dr. H. Lederer carried out the cultural investigation at Doncaster, and Dr. A. L. Little, County Laboratories, Wakefield, the investigations for Sheffield and Barnsley.

REFERENCES


ADDITIONAL BIBLIOGRAPHY


La culture anaérobie dans le diagnostic de l'urétrite non-gonococcique

RÉSUMÉ

(1) 98 séums, 85 tirés de 81 hommes atteints d'urétrite non-gonococcique, et 13 tirés de 10 de leurs partenaires sexuelles, furent cultivés hors de l'air pendant 5 jours; 78,73% ne montrèrent aucune croissance et des organismes commensaux furent cultivés dans 21,27%.

(2) Il n'y avait aucune correspondance entre les cultures des hommes et des femmes.

(3) L'urétrite non-gonococcique fut plus de deux fois plus commune parmi les malades blancs (52,7%) que parmi ceux de couleur (23,09%).

(4) On ne trouva aucun organisme anaérobie qui pouvait être associé à l'urétrite non-gonococcique ou qui pouvait la causer.

(5) Il faut approfondir nos études de l'origine de cette maladie.
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