EPIDEMIOLOGY OF NON-SPECIFIC URETHRITIS*

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The disease, or group of diseases, known as non-specific urethritis (N.S.U.) is very common and appears to be increasing in incidence. In spite of much investigation, its cause is still unknown. The evidence for the view that it is a venereal disease is strong, but by no means conclusive. Final proof will depend upon discovery of the causative agent.

The purpose of the present investigation was to study the epidemiology of the disease by examining in detail the histories of 200 patients suffering from non-specific urethritis and comparing them with those of 200 similar patients suffering from gonorrhoea (G.C.). The information was collected by means of a specially-designed questionnaire.

Material

The patients were drawn in equal numbers from two large centres for venereal diseases, St. Mary's Hospital and the London Hospital, and all data at each centre were collected by one of us. In the hope of reaching a clearer picture, it was decided to restrict the cases to first attacks of urethritis, and to exclude coloured patients on the grounds that some could speak no English and others would provide incomplete information through shyness or lack of understanding of the serious purpose of the inquiry.

Examination and interview elicited details of each patient's personal particulars, presenting symptoms, and the clinical findings. Information was sought as to the patient's recent sexual history, including masturbation and nocturnal emissions. Other specific inquiries included the number and type of sexual contacts, the use of prophylactic measures, the consumption of alcohol during the 3 days before the onset of symptoms, and details of previous antibiotic therapy, if any. Patients were also questioned as to any history of allergy or arthritis relating to themselves and members of their families.

Results

Age and Marital Status.—The proportion of patients over 40 years of age was slightly higher in the N.S.U. group (17 per cent.) than in the G.C. group (10 per cent.) but in general the age pattern was not very different in the two series (Table I). About half of the patients in each group were between 20 and 30 years of age and about one quarter between 30 and 40 years. 29 per cent. of the patients with N.S.U. were married as compared with 20 per cent. of those with gonorrhoea.

TABLE I
AGE DISTRIBUTION OF PATIENTS

Age (yrs)	No. of Patients	
	N.S.U.	G.C.
Under 20	14	13
20	99	110
30	46	52
40	24	17
50	9	2
60+	1	0
Not Stated	7	6
Total	200	200

Clinical Details.—Of the patients with N.S.U., all but three complained of urethral discharge at their first attendance. The discharges were usually white in colour, slight in amount, and thin in consistency, while those due to gonorrhoea were more often yellowish, profuse, and thick (Table II). 29 per cent. of N.S.U. patients were conscious of discharge only in the early mornings, as compared with 9 per cent. of G.C. patients. 68 per cent., as compared with 90 per cent., were conscious of it all day. The next most frequent symptoms (Table III) were dysuria, which was rather commoner in the G.C. group, urethral irritation, pain, and frequency of micturition. Symptoms such as haematuria, testicular pain, and painful erections were rare in both groups. Few patients complained of any general symptoms and though nineteen patients with N.S.U. and seven G.C. patients stated that they "did not feel well", only seven and six respectively admitted to any pain elsewhere

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than the genitalia. This pain was slight and usually involved the muscles and soft tissues in the region of the spine.

TABLE II
CHARACTERISTICS OF URETHRAL DISCHARGES

Urethral Discharge		No. of Patients	
		N.S.U.	G.C.
Amount	Slight	102	38
	Moderate	59	32
	Profuse	35	130
	Not Stated	4	—
Colour	Colourless	21	3
	White(ish)	121	31
	Yellow(ish)	52	161
	Green	2	5
	Not Stated	4	—
Consistency	Watery	23	1
	Mucoid	99	51
	Muco-purulent	33	12
	Purulent	41	136
	Not Stated	4	—
Total		200	200

TABLE III
PRESENTING SYMPTOMS

Symptom	No. of Patients	
	N.S.U.	G.C.
Urethral discharge	197	200
Urethral irritation	59	38
Urethral pain	20	28
Frequency of micturition	20	15
Dysuria	62	84
Haematuria	4	2
Testicular pain	2	1
Scrotal swelling	2	1
Painful erections	1	1
Haemospermia	1	1

It appeared that N.S.U. patients had reported to the clinics with, on the average, a longer history of symptoms than those with G.C. (Table IV); 84 per cent. first attended with G.C. less than a week after the onset of symptoms, as compared with 64 per cent. with N.S.U. There were 32 persons with N.S.U., but only eight with G.C., who had noted symptoms more than a fortnight before attendance, and no less than eleven N.S.U. patients gave a history of more than 6 weeks' duration of symptoms.

TABLE IV
DURATION OF SYMPTOMS BEFORE FIRST ATTENDANCE AT CLINIC

Duration (wks)	No. of Patients	
	N.S.U.	G.C.
0—	127	167
1—	39	21
2—	13	5
3—	5	2
4—	2	1
5—	1	—
6—	10	—
52+	1	—
Not Stated	2	4
Total	200	200

Sexual Habits.—The histories relating to sexual intercourse during the 3 months preceding the onset of symptoms provided a contrast between the groups with respect to types of partner involved (Table V). In the N.S.U. series there were fourteen patients who denied any sexual exposure during this period and a further 31 patients admitted only marital intercourse. The comparable numbers of G.C. patients were two and seven respectively. Thus 96 per cent. of the patients with G.C. admitted recent extra-marital exposure against only 78 per cent. of the N.S.U. patients. Histories of casual exposure were more frequent in the G.C. group. Very few patients in either group took any precautions against infection; nineteen patients (fifteen N.S.U., four G.C.) stated that they always used contraceptive sheaths, three patients with N.S.U. and five with G.C. washed after exposure, and only two (both G.C.) applied any form of ointment.

TABLE V
SEXUAL HABITS
TYPES OF CONSORTS (TOTAL FOR EACH TYPE) WITHIN THE 3 MONTHS PREVIOUS TO ONSET OF SYMPTOMS

Consort*	No. of Patients	
	N.S.U.	G.C.
None	14	2
Wife	46	29
Fiancée	4	2
Friend	49	42
Casual Acquaintance	70	92
Prostitute	36	56
Homosexual	4	11

*The given categories, except for "None", are not mutually exclusive.

The proportion of married patients giving histories of recent marital intercourse was very similar in the two groups: 46 out of 58 patients with N.S.U. (79 per cent.), and 29 out of forty with gonorrhoea (73 per cent.). There was, however, a considerable difference in the frequency of extra-marital intercourse in these two sub-groups. Of the 46 N.S.U. patients giving a history of recent marital intercourse, fifteen (33 per cent.) compared with 22 (76 per cent.) of the comparable 29 G.C. patients, admitted recent extra-marital exposure as well.

There was also a difference between the admitted frequency of masturbation (Table VI) in the two groups, though this was largely confined to the data from one

TABLE VI
INCIDENCE OF MASTURBATION

History	No. of Patients	
	N.S.U.	G.C.
Admitted regular masturbation	51	27
Did not admit regular masturbation but admitted episode within previous 6 mths	20	23
Denied	114	127
Not Stated	15	23
Total	200	200

centre. At the London Hospital 48 patients suffering from N.S.U. gave a history of masturbation within the preceding 6 months, and 34 of these admitted regular masturbation. Of those with gonorrhoea only sixteen admitted regular masturbation and a further ten admitted single episodes within the preceding 6 months. At St. Mary's Hospital on the other hand, the proportion of patients giving a history of masturbation was practically the same in each group (23 and 24 per cent. respectively), though there were again rather more regular masturbators in the N.S.U. group, seventeen patients compared with eleven in the G.C. series. The recorded incidence of nocturnal emissions was similar in the two groups. In each group 56-57 per cent. gave a negative history, while 23 N.S.U. patients and twenty G.C. patients stated that nocturnal emissions occurred at least once per month.

Incubation Periods.—Assuming a venereal origin, an attempt was made to estimate an "incubation period" for each patient by noting the interval between the date of the most recent extra-marital sexual exposure and the date of onset of symptoms. This was possible for only 146 N.S.U. patients and 188 patients with gonorrhoea (Table VII); most of the remaining patients denied extra-marital exposure, while in a few instances the relevant data were insufficiently detailed to allow an estimate to be made.

TABLE VII

FREQUENCY DISTRIBUTION OF ESTIMATED INCUBATION PERIODS (INTERVALS BETWEEN MOST RECENT EXTRA-MARITAL INTERCOURSE AND ONSET OF SYMPTOMS)

Days since Extra-marital Intercourse	No. of Patients	
	N.S.U.	G.C.
0	2	3
1	8	16
2	7	19
3	7	25
4	9	23
5	11	19
6	3	16
7	11	14
8	6	10
9	7	4
10	4	6
11	4	8
12	5	4
13	3	4
14—	19	9
21—	9	4
28—	12	2
35—	6	0
42-91	13	3
No intercourse within previous 3 months	14	2
No extra-marital intercourse within previous 3 months	31	7
Insufficient data available	9	3
Total	200	200

The distribution of incubation periods in the 188 G.C. patients showed a peak around 3-4 days followed by a steady decline, in 77 per cent. of the cases the period was 8 days or less. The 146 N.S.U. patients, however,

failed to provide any evidence of a consistent time relationship between extra-marital exposure and onset of symptoms. Only 44 per cent. reported intervals of 8 days or less, and there was no evidence of any peak within this period; a similar proportion (40 per cent.) reported intervals of between 2 and 13 weeks.

Previous History.—Inquiry as to medical history under the headings enumerated (Table VIII) revealed no marked differences except for histories of allergic disorder. Twelve of the patients with N.S.U. compared with two G.C. patients gave a history of allergic disorder such as asthma, hay fever, urticaria, or eczema. The data from the two centres, however, again differed in this respect, in the London Hospital patients ten with N.S.U. and one with G.C. gave positive histories, while the comparable figures from St. Mary's Hospital were two and one respectively. Eight patients with N.S.U. (five from St. Mary's Hospital) and three G.C. patients (none from St. Mary's Hospital) gave a family history of allergy.

TABLE VIII
PREVIOUS MEDICAL HISTORY

Disease (or Disease Grouping)	No. of Patients	
	N.S.U.	G.C.
Allergic Disorders	12	2
Urinary Tract Disorders	5	2
Enuresis	2	1
Neurosis/Psychosis	5	7
Skin Disease	6	6
Arthritis (Non-rheumatoid)	1	2

Only 32 patients with N.S.U. and 44 with G.C. admitted taking alcohol during the 3 days before the onset of symptoms. Among the London Hospital patients, the number who had previously received antibiotic therapy was similar in the two groups, namely 35 patients with N.S.U. and forty with G.C. At St. Mary's Hospital the comparable numbers were sixteen and four respectively.

Discussion

These data confirm the impression that in many ways the two diseases behave very differently. Gonorrhoea, a disease with an established cause, shows a clear-cut pattern of behaviour relating especially to incubation periods, duration of symptoms before seeking medical attention, and sexual habits. No such pattern was evident for the N.S.U. patients. The most likely explanation would appear to be that the condition in the groups studied was due to a number of different causes. Of some interest was the finding that a higher proportion of N.S.U. patients admitted to regular masturbation than those with gonorrhoea. It is hard to see how this could be of immediate aetiological significance, but it is at least conceivable that the habit may

render the urethral mucous membrane more susceptible to infection as the result of trauma, or by local changes induced by stasis or congestion.

The details relating to sexual exposure are also illuminating. Two of the 200 G.C. patients denied sexual exposure; it seems reasonable to suppose that these patients were not telling the truth and hence may represent the approximate number of false answers to be expected to such an inquiry. No less than fourteen N.S.U. patients, however, denied any sexual exposure within 3 months of onset of symptoms. This might be interpreted as showing that, in perhaps a few cases of N.S.U., the disease may not be related to sexual intercourse. On the other hand, long incubation periods, latency, and relapse may account for the finding. The fact that N.S.U., and for that matter gonorrhoea also, may follow marital intercourse is well known and is confirmed here, but it is also noticeable that more than three-quarters of the cases of N.S.U. followed recent extra-marital intercourse.

Local applications to the genitalia do not appear to play any part in the genesis of N.S.U. The wearing of a contraceptive sheath did not appear to prevent the development of N.S.U. in fifteen cases and gonorrhoea in four. However, it is possible that unprotected genital contact without penetration or soiling with the hands after intercourse may have taken place in these cases.

Alcohol is frequently described as a factor which may be of importance in the aetiology of N.S.U., but in the present series no such evidence was found.

Parino (Personal communication, 1955), who reported a similar study of the epidemiology of N.S.U. among men serving in the United States forces, found that N.S.U. and G.C. patients were comparable in age and marital status, but noted marked differences in the estimated incubation

periods of the two diseases, that of N.S.U. being much more variable and longer than that of G.C. However, in their study, the comparison with gonorrhoea was limited to these three factors.

Summary

Clinical and epidemiological histories obtained from 200 cases of non-specific urethritis were compared with similar data from an equal number of cases of gonorrhoea. Both series were restricted to white males who attended one or other of two venereal disease clinics in London with a *first* attack of urethritis.

It was confirmed that in many ways the two diseases behave very differently. In particular the relationship between extra-marital sexual exposure and onset of the disease was less definite among patients with non-specific urethritis. A substantial minority (23 per cent.) of patients with this disease denied any recent extra-marital intercourse; for those admitting to such exposure the time interval between intercourse and onset of symptoms varied widely and did not conform to any definite pattern.

A higher proportion of patients with non-specific urethritis gave histories of regular masturbation and of previous allergic disorder, but the difference in both these respects was confined largely to patients attending one clinic. There was no evidence that the use of alcohol, locally applied chemicals, or contraceptives, or the previous administration of antibiotics played any part in the aetiology of the disease.

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