Social and psychological factors in the distribution of STD in male clinic attenders

I Demographic and social factors

K W M FULFORD,* R D CATTE RALL,+ E HOINVILLE,‡ K S LIM§ AND G D WILSON*

From the *Institute of Psychiatry, Maudsley Hospital, London, the Departments of Genitourinary Medicine, †Middlesex Hospital, London, and §§King’s College Hospital, London, and the ¶Institute of Computer Sciences and Statistics, Queen Mary College, University of London

SUMMARY We describe three related studies of possible aetiological risk factors for sexually transmitted diseases (STDs) in men attending an STD clinic. In this paper we present the results for a variety of social and demographic variables traditionally associated with STD. In contrast to the results in the next two papers, these were largely negative. Occurrence rates of overall STD or of hepatitis, syphilis, gonorrhoea, or non-specific urethritis (NSU) had no aetiologically relevant association with age, nationality, marital status, social class, occupation, non-sexual social contact, drug abuse, or aggressive attitudes and behaviour. Gonorrhoea, however, was the only STD which correlated with alcohol abuse and with eating out rather than at home. We conclude that, with the possible exception of gonorrhoea, social factors contribute little to the distribution of STD risk within the study population.

Introduction to papers I to III

The incidence of sexually transmitted disease (STD) has risen to epidemic levels in recent years in many parts of the world, although the reasons for this remain obscure. It has been widely assumed that a) because STDs are normally acquired during sexual intercourse the risk of infection is related to sexually promiscuous behaviour, and b) sexual promiscuity is in turn linked in various ways with other social and psychological factors. There is surprisingly little direct evidence to support either of these assumptions, however, let alone information on the precise mechanisms through which sexual and other aspects of behaviour might influence risk of STD infection.

The investigations described in this and the two following papers bear directly on these questions. Each investigation was based on an experimental design whose rationale, scope, and limitations are discussed in this paper and in paper III. Essentially this design involves a series of comparisons within the clinic population between the distributions of STD diagnoses and the distributions of possible aetiological risk factors. A positive correlation between the distribution of a particular STD and that of a particular risk factor suggests (with several important qualifications discussed below) that that factor may contribute to the risk of acquiring that STD. Conversely, a negative correlation suggests some possible protective effect.

The results for three different types of possible risk factors are reported in these three papers: paper I covers social and demographic variables, paper II a variety of psychological factors, and paper III aspects of sexual behaviour. Each paper draws on the results of the study as a whole, and the methods employed are therefore described mainly in paper I. The three papers, taken together, suggest important conclusions about the aetiology of STD and about the direction of future research in this area. These are discussed in paper III.

Patients and methods

The study population comprised 1045 men attending the department of sexually transmitted disease at the Middlesex Hospital in London. All patients we:
seen initially by a receptionist who recorded details of age, nationality, occupation, and marital status. Clinical histories were taken and physical examinations performed by a doctor. Diagnostic tests were carried out by the doctor or by a trained nursing assistant in the clinic, and subsequently in the laboratory. Diagnoses were therefore based on a thorough clinical assessment combined with local and laboratory investigations, including serology tests and cultures where appropriate. Syphilis was diagnosed by dark field examination and serological tests (the Wasserman reaction (WR), Venereal Disease Research Laboratory (VDR) test, Reiter protein complement fixation test (RPCFT), and the fluorescent treponemal antibody (FTA) test); nontypable gonorrhoea by stained slides and culture; non-specific urethritis by stained slides; candidal balanitis by stained slides and culture; genital herpes by virological culture; trichomoniasis by culture; and pediculosis pubis, molluscum contagiosum, tinea cruris, scabies, and genital warts by direct examination. In two of the three studies, sensitive immuno-diffusion tests for Australia antigen (HBsAg) and antibody (HBSAb) were included as described previously.

The study population was divided into three main groups of patients.

**GROUP A**
This group of 608 men included all who attended the clinic during a three week period on whom a blood test for syphilis was performed; that is, all new patients, all patients with a new diagnosis, and many who were attending for a follow up appointment.

**Data collection**
Information was taken from the clinical notes on a wide range of variables including age, marital status, nationality, occupation, sexual orientation, estimated total lifetime number of sexual partners, categories of sexual contact (regular, marital, casual, or prostitute), and current and previous STD infections. The results of laboratory tests were recorded only when the collection of clinical data had been completed.

**Analysis**
The data were coded using a simple decimal representation and certain new variables were defined. The resulting variables were analysed on the CDC 6000 computer at the Institute of Computer Science, London University. The Statistical Package for the Social Sciences programme was used both for correlations and for cross tabulations, the χ² test for goodness of fit being used to calculate levels of significance.

**GROUP B**
A group of 227 men attending during a period of six months was randomly selected over particular collection periods on a simple numerical basis, excluding only those who were unable to speak English.

**Data collection**
Clinical information similar to that obtained for Group A was taken from the patient’s notes. Before being seen by the clinic doctor, each patient was asked to complete the Eysenck personality questionnaire, the Eysenck sexual attitudes questionnaire, and the Buss-Durkee hostility inventory. Although only nine subjects refused to take part in the study, variable numbers failed to complete one or more of the questionnaires adequately (numbers indicated with results). Excluded subjects showed a distribution of STD diagnoses which was similar to that found among those retained in the study. In addition to completing the questionnaires, a randomly selected subgroup of 45 patients had a semistructured interview with one of us (KWMF) covering details of sexual activity.

**Analysis**
A correlation matrix was generated, and means and standard deviations were calculated using the Factor programme available on the University of London 6600 computer.

**GROUP C**
A random sample of 210 men was selected as for Group B from patients attending over a period of three months, excluding only those who were unable to speak English. Three patients refused to take part in the study, but a further seven were excluded because the information obtained from them was incomplete. The excluded patients showed no unusual characteristics, being similar to the study group in age, sexual orientation, and STD history.

**Data collection**
A semistructured interview was used to obtain information on the variables listed for Group A, but with more complete and detailed sexual and social histories. In this study, to minimise the possibility of bias, in all but a small minority of cases the medical histories were taken by a different interviewer from the one taking the sexual and social histories. The new variables included age of first sexual intercourse, form of sexual intercourse (rectal, vaginal, orogenital with or without semen swallowing, and oroanal), contraceptive practice, relevant social practices (eating out, sharing bathroom, razor, or toothbrush), and possible markers of delinquency (drug abuse, both oral and by injection, and alcohol
Serological tests were performed for syphilis and for Australia antigen positive hepatitis, using techniques that were similar to, though slightly more sensitive than, those employed in Group A. Plasma samples were analysed on the Vicker's Automatic Analyser to determine concentrations of cholesterol, bilirubin, total protein, albumen, urea, and uric acid and activity of alkaline phosphatase and aspartate transaminase.

**Analysis**
The data were analysed using a similar method to that used for Group A.

**Results**
A majority of the results presented in this paper are derived from Groups A and C. Except where otherwise indicated, the results from one group are consistent with those found in the other two.

**DEMOGRAPHIC VARIABLES**
The relation between risk of STD infection and the variables of age, nationality, marital status, and social class, were examined in Group A.

**Age**
No significant differences between five year age groups were found in the rates of diagnoses of STD in general or of a majority of individual STDs. Syphilis (p<0.01) and hepatitis (p<0.001) were, however, more common in older age groups.

**Nationality**
Rates of diagnoses for British patients were compared with those for each of the more common groups of non-British nationalities examined separately (middle European, Scandinavian, Mediterranean, African, Asian, and West Indian). Overall, non-British subjects visiting the clinic were more likely than British subjects to have a positive diagnosis (p<0.05), but there were no other significant findings.

**Marital status**
Subjects were compared in the main marital status categories: married, single, divorced, separated, and widowed. Married subjects tended to show lower rates of positive diagnoses than the other categories, but there were no significant differences between the groups.

**Social class**
Subjects were classified by the Registrar General's classification of occupations. Diagnoses of hepatitis were slightly lower (p<0.05) and of NSU slightly higher (p<0.05) in social class I, but there were no other significant findings.

**OCCUPATIONAL SUB-GROUPS**
Certain occupations (student, businessman, salesman, and airline worker) were sufficiently well represented to allow separate analyses in Group A but none showed any significant differences for STD rates. Table I shows results for three particular occupational and geographical variables examined in Group C. No increased risk was found for rates of STD in general or for syphilis, hepatitis, NSU, or gonorrhoea through employment at any time in hospitals, or employment or prolonged residence (more than three weeks) in the Middle East (principally Bahrain, Egypt, Iraq, Israel, Lebanon, Libya, Persia, Turkey, and Yemen) or the tropics (principally the Africas, Sri Lanka, India, Malaysia, Pakistan, and the West Indies). Indeed, syphilis appeared to be less common among those who had worked in hospitals (p<0.05).

**NON-SEXUAL SOCIAL CONTACT**
Table II shows the percentages of men in Group C with diagnoses of any STD, hepatitis, syphilis, gonorrhoea, or NSU for those sharing facilities in the home (bath, toothbrush, and razor) and playing body contact sports. None of these variables showed any significant differences.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Work or prolonged residence in:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hospital (n=91)</td>
</tr>
<tr>
<td>Any STD (n=174)</td>
<td>47.7</td>
</tr>
<tr>
<td>Hepatitis (n=27)</td>
<td>31.3</td>
</tr>
<tr>
<td>Syphilis (n=36)</td>
<td>29.4*</td>
</tr>
<tr>
<td>Gonorrhoea (n=82)</td>
<td>55.6</td>
</tr>
<tr>
<td>NSU (n=101)</td>
<td>51.5</td>
</tr>
</tbody>
</table>

* = p<0.05.

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Patients sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bath (n=163)</td>
</tr>
<tr>
<td>Any STD</td>
<td>86.8</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>87.5</td>
</tr>
<tr>
<td>Syphilis</td>
<td>82.4</td>
</tr>
<tr>
<td>Gonorrhoea</td>
<td>88.5</td>
</tr>
<tr>
<td>NSU</td>
<td>83.8</td>
</tr>
</tbody>
</table>

Summary of χ² tables comparing percentage positive diagnoses with occupational and geographical variables in Group C patients.
SOCIAL ACTIVITIES AND DRUGS AND ALCOHOL ABUSE

The interviews with Group C patients included questions about frequency of eating out rather than at home, abuse of alcohol (more than eight pints of beer, a quarter bottle of spirits, or two bottles of wine a day, or medical complications at any time), and oral drugs. (Only one patient admitted to intravenous drug abuse and injection marks were found on no other patients.) Table III shows the correlation coefficients which were calculated for these data. Only gonorrhoea showed significant positive correlations both with eating out ($r = 0.14$, $p < 0.05$) and with alcohol abuse ($r = 0.14$, $p < 0.05$). Indeed, negative correlations were found for hepatitis with eating out ($r = -0.14$, $p < 0.05$) and between syphilis and oral drug abuse ($r = -0.21$, $p < 0.005$). Serological test results were normal apart from slightly raised bilirubin concentrations and aspartate transaminase activity and slightly low albumen concentrations in subjects with positive blood tests for hepatitis.

AGGRESSION

Aggressive attitudes were examined in 175 of the men in Group B using the Buss-Durkee hostility inventory, and questions about violent behaviour (whether or not involving police proceedings) were included in the interviews with the subgroup of 45 men. No significant results were obtained in relation to diagnoses of STD.

Discussion

Social and demographic variables of the kinds examined in this paper have been widely regarded as important factors in the aetiology of STD. It has even been suggested that changes in these variables might help to explain the sharp increase in the prevalence of STD in recent years. Others have argued that this rise should be regarded as a symptom of social ill health, along with divorce, abortion, and crimes of violence.

The results presented in this paper lend little support to these views. Despite suggestions to the contrary, marital breakdown did not appear to be an important risk factor. As other authors have found, married men were slightly less at risk than any of the categories of unmarried men (though the difference did not reach the 0.05 level of significance), but there were no differences at all between divorced and other categories of unmarried men. Similarly, no consistent associations were found with nationality or with occupational categories. In particular, occupations involving travel and those, such as working in hospitals, that might lead to exposure to infected materials did not appear to be associated with increased risk. Non-sexual social contact, either domestic or through body contact sports, gave uniformly negative results. Finally, there was no evidence, either from interviews or from questionnaires, of associations between STD and either violence or drug abuse.

These broadly non-significant results may be expected from studies that are based on clinic attenders only, rather than on comparisons between clinic attenders and other groups. Comparative studies, however, although commonly reported by research workers in this field, may not always discriminate between those characteristics of clinic attenders that are aetiological related to STD risk and those that are not. For example, clinic attenders tend to be younger than average, but in this study age did not differ between high and low risk subjects. (The higher rates of diagnoses of syphilis and hepatitis in older age groups is probably because these diagnoses were made on the basis of serological tests that often remain positive for many years). Younger men are, on the whole, more sexually active than older men. Indeed, Eysenck’s data on the frequency of sexual intercourse in men shows an age distribution closely similar to that for male clinic attenders. But it is sexual activity, rather than youthfulness, that is the relevant factor.

These results, furthermore, should be considered in context. Firstly, despite being mainly non-significant results they are not unprecedented. For example, in his study of the medical, social, and psychological consequences of marital breakdown, Dominion did not report increased rates of STD. Similarly Schofield found that, contrary to popular opinion, STD among seamen is commonly contracted in their home country rather than while travelling abroad. Secondly, while most of these results are non-significant, some are in fact significant. Thus Schofield has suggested that STD risk might be related to social and hedonistic pursuits in non-sexual
contexts, while other authors have associated STD with alcoholism. In the present study, gonorrhoea, though not other STDs examined, correlated positively both with eating out rather than at home, and with abuse of alcohol. In itself, this result might not perhaps be of much significance. It does, however, suggest that the method used in this study is highly discriminating, not only among possible risk factors, but also among different STDs. The importance of this generally, and the particular relevance of the difference found between gonorrhoea and other STDs, will become apparent in the next two papers.

The existence of a statistical association between two variables does not, of course, prove a causal association between them, let alone the direction of that association (that is, which is cause and which effect, or whether both are the result of some common cause). If two variables are not statistically associated, however, it is unlikely that there is any strong causal connection between them. It is of course true that studies of this kind provide information only about the clinic population, the constitution of which is determined by a wide variety of selection factors. Nonetheless, the results reported in this paper suggest that, while demographic and social factors may contribute to some extent to STD risk, they are probably not in themselves of much direct importance in the aetiology of these conditions.

References

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