



Global views

Gonorrhoea control programme in Athens, 1974–98

Introduction

A prominent theme today is the influence of dynamically changing demographic and sociocultural forces on the spread of sexual transmitted diseases (STDs). In most industrialised countries the incidence of classic STDs such as gonorrhoea has been declining rapidly among the educated middle and upper classes.^{1,2}

The aim of this study was to evaluate a gonorrhoea case finding programme which took place in Athens from 1974 to 1998 (25 years).

Patients and methods

The study was approved by the Greek ethics committee.

The gonorrhoea case finding and treatment programme took place between 9 am and 12 noon on 6 days per week between 1 January 1974 and 31 December 1998. People were recruited for examination in "A Syngros" Hospital, Athens, then taken to the same hospital for further investigation and treatment.

DIAGNOSTIC TESTS

Direct microscopy and culture were the mainstay of gonorrhoea diagnosis. Samples could be Gram stained and examined by light microscopy to yield a diagnosis within 5 minutes. Accuracy varied with the site sampled and the experience of the microscopist. If there was a strong likelihood of infection and if presumptive treatment had not been given, a second or even third set of cultures performed on subsequent occasions maximised detection.³

Isolation of gonococci was also improved by the parallel use of selective and non-selective media. In practice, acceptable results were active with moderately selective media. Carbohydrate utilisation tests or newer methods such as co-agglutination and chromogenic enzyme substrates were used.

TREATMENT

Patients were interviewed, informed of potential side effects, and asked to sign a form allowing treatment. Penicillin cured more than 90% of all gonorrhoea infections. By the late 1980s, penicillin therapy for gonorrhoea was no longer recommended because of widespread gonococcus resistance. Instead, another relatively inexpensive drug, such as tetracycline, ciprofloxacin, ofloxacin, ceftriaxone, or quinolones, became widespread in Greece. Because clinical series have historically documented co-infection with *Chlamydia trachomatis* in patients with gonorrhoea—as high as 20%—routinely co-treating for chlamydia in all cases of gonorrhoea has been an important public health measure for chlamydia control. Consequently, either azithromycin or doxycycline should be given.^{4,6}

Results

Figure 1 shows new gonorrhoea cases for each year between 1974 and 1998 in men and women. During this programme 1 643 823 subjects were examined, of whom 858 879 (52.2%) were males and 784 944 (47.8%) were females. Among positive cases 9834 (98.6%) were males and only 143 (1.43%) were females, 735 (7.5%) males and 14 (9.79%) females were asymptomatic (carriers) when discovered.

In addition, the median age of the total examined subjects was 20 years (range 18–39 years). For men, all age strata remained stable from 1974 to 1981 followed by a sharp drop, the minimum occurring in 1996. In contrast, the notified women were on average younger than men. Although the total number of the identified cases declined to a minimum, from 1989 up to the end of this study, 50/690 (7.3%) males and 2/14 (14.4%) females were discovered to have both gonorrhoea and chlamydia infection.

Table 1 Reported gonorrhoea cases by sex, drug use, involvement with prostitution and other occupations (where available). Programme cases (n = 9977)

Characteristic	No of cases	%
Males	9834	98.57
Females	143	1.43
Users of any illicit drug	783	7.84
Homosexuals	696	6.98
Prostitutes and clients	2248	22.6
Food retailers	56	0.56
Wholesalers	34	0.34
Nursery	28	0.28
School workers	12	0.12
Hotel workers	1285	12.87
Seafarers	1771	17.75
Other (clerks, nurses, drivers, etc)	1616	16.18
Unknown	1448	14.51

As was expected urethritis was the predominant clinical finding (95%) among men followed by a gonorrhoea infection of the rectum which was very common among male homosexuals (41%). The cervix was most often affected in women (43%).

Additionally, data available from this programme for active gonorrhoea among occupational groups are presented in table 1.

Discussion

During the past 25 years major changes have been made in the notification of new gonorrhoea cases, especially those related to the male population. From 1974 to 1984 the new cases among males were over 450 per year and thereafter gradually declined.

In contrast, during the same period of study the number of cases among women remained almost stable. It is estimated that the affected males visited our hospital much more often because their symptoms were obvious and severe and they had not been afraid of social stigma associated with their examination for the disease. Interestingly, the observed very small number of female patients could be because of self treatment, the fear of a social stigma, and/or a general unwillingness to be examined by a doctor.

In addition, the observed continuing decline in the incidence of the disease as well as in the absolute number of the identified cases, especially in men, from 1984 up to the end of 1998 could be due to the following reasons: (a) the better standard of living, (b) the use of a condom as a preventive measure against AIDS,⁷ (c) a higher education level, and/or (d) the opportunity of a medical examination in a private venereal clinic, avoiding self presentation to our department.

On the other hand, the median age of gonorrhoea cases as well as the number of the identified cases showed a continuing decline, which stopped from 1981 to the end of 1984, when a strong wave of immigration from eastern Europe, especially from Russia, moved to Greece. It is well documented that

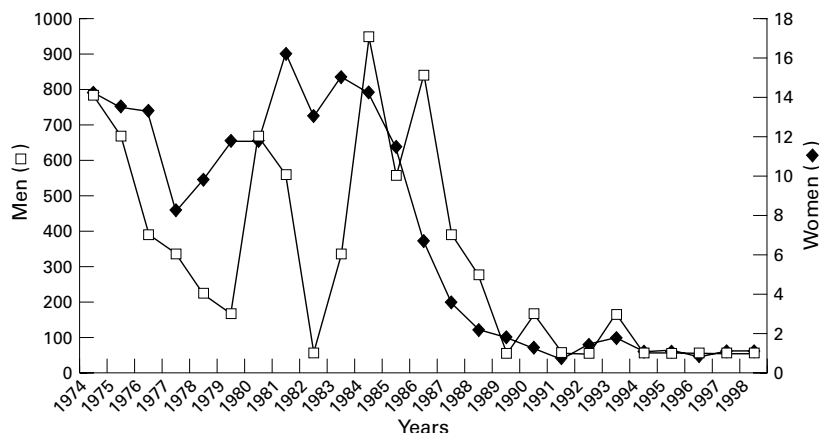


Figure 1 Gonorrhoea case finding programme.

during this period STDs had shown a rapid and substantial increase in eastern Europe.⁸

The incidence of co-infection with gonococci and chlamydia (7.3% and 14.4% for men and women, respectively) was not greater compared with that in other countries.⁶

Furthermore, serial surveys provided the useful information that prostitutes and especially people (clients), who had sexual contacts with them, shared the greatest proportion of gonorrhoea cases as a consequence of the Greek law which obliged this occupational group, but not the clients, to be "followed up" monthly. The hotel workers, who might indirectly relate to the previous occupational group, were found as the third most affected occupational group whereas the seafarers, who could directly relate to the above occupational groups in Greece and other foreign countries, were also highly affected.⁹⁻¹¹ Homosexuals and the users of illicit drugs were similarly affected.

However, people with better education and higher standard of living such as workers in schools, nurseries, food retailers and wholesalers shared a low proportion of the positive cases in this study.¹²

The high percentage of early diagnosed cases (which were asymptomatic) among the case patients suggested that this preventive measure reduced transmission, since asymptomatic men accounted for a disproportionate share of STD transmission and were unlikely to seek medical attention on their own.^{10, 11}

Thus, an approach, such as the present study, might be recommended for people recruited for examination. Furthermore, the possibility of incorporating other cities in this programme could also offer a valuable nationwide profile of STDs.

Contributors: SG followed up the gonorrhoea cases; KHS analysed the positive cases and wrote the manuscript; CG enrolled a number of the participants of the programme and found the recent references; GAK did the laboratory tests.

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Prevalence of *Chlamydia trachomatis* infections in women attending six women's healthcare units in Kaunas, Lithuania

Introduction

Knowledge about the morbidity caused by *Chlamydia trachomatis* in eastern Europe is still insufficient. Reporting systems of sexually transmitted diseases and diagnostic tools, especially for the diagnosis of chlamydial infections, are still suboptimal,¹ epidemiological studies are costly, and national resources devoted to STD prevention and control are small.

The aim of this study was to investigate the prevalence of *C trachomatis* infections in Lithuanian women, attending six main healthcare units in Kaunas, the second biggest Lithuanian town (500 000 inhabitants) and to learn about risk factors related to genital chlamydial infections.

Materials and methods

Women (n=1008) attending four gynaecological outpatient clinics and two antenatal clinics in Kaunas (Lithuania) between November 1999 and December 2000 were enrolled.

Study participants were given a standardised questionnaire concerning social status, sexual behaviour and contraceptive habits, medical and sexual history, and presence of genitourinary symptoms. Pelvic examination was carried out using a standardised examination protocol.

Direct microscopy of the vaginal wet mounts, methylene blue stained urethral and cervical smears was done "bedside." The direct immunofluorescence (DIF) test (Syva MicroTrak *Chlamydia trachomatis* Direct

Specimen Test, Trinity biotech, Ireland) was used for chlamydia antigen detection.

Results

The median age of the population tested was 25 (mean age 26.1) years. Of the patients who answered the question about the reason of visiting, 513 (59.2%) came for symptom evaluation, 300 (34.6%) for a regular check up, and 53 (6.1%) for a test of cure. There was no significant difference in the reason to attend different clinics.

The overall prevalence of *C trachomatis* infection was 8.4%. The highest prevalence of *C trachomatis* was observed in women below 19 years of age (17.4%), in women 20-40 years decreasing to 6.1-7.9%. In women older than 40 years, there was seen to be a further decrease to 2.9%.

There was a significant difference between the medical facility and the prevalence of *C trachomatis* infections. Thus, *C trachomatis* positive patients were: 6.7% of the women consulting OPGC I; 4.5%, OPGC II; 4.0%, OPGC III; 11.3%, OPGC IV; 9.5%, AC I; and 13.5%, AC II, respectively ($p < 0.001$).

Figure 1 demonstrates the association between the percentage of young people (below 19 years of age) attending a certain health facility and the prevalence of *C trachomatis* infection.

Trichomonas vaginalis was detected in the wet mounts of 2.9%, candida in 14.3%, and bacterial vaginosis in 14.1% of the women tested. *Neisseria gonorrhoeae* was detected in 0.4% of the cervical smears.

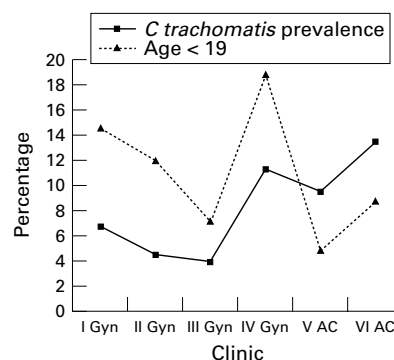


Figure 1 Prevalence of *C trachomatis* infections and percentage of women aged below 19 years in 1008 women attending six women's health units in Kaunas, Lithuania.

Smokers (n = 243; 24.3%) were significantly more often chlamydia positive compared with non-smokers (13.2% v 7%, OR 2.0, 95% CI 1.3-3.2; $p < 0.005$). Smokers had significantly often more than two sexual partners during the last 2 months compared with non-smokers (41.3% v 23.6%, OR 2.3, 95% CI 1.2-4.2). Significantly more smokers had had their first sexual intercourse at below 18 years of age ($p < 0.001$).

The median age at sexual debut was 18 years (mean 19 (SD 2.7)). The median number of partners during the last 6 months was 1 (range 1-2), during 12 months 1 (1-7), during their lifetime, 1 (1-50). Significantly more women who started their sexual life

before 18 and had more than one sexual partner during the last 6 or 12 months had a chlamydial infection.

The reason for attending, marital status, education, occupation, past or present genitourinary symptoms, a history of reproductive tract infections, day of the menstrual cycle, child birth, legal abortions or miscarriages did not affect the incidence of *C trachomatis* infection.

Approximately one fourth of the women could not answer the question about their sexual partner's genital symptoms, if any, or if he was tested for any reproductive tract infection, neither did they know if he had ever had any infection.

C trachomatis positive women more often had cervical discharge (44% v 22%, OR 2.7, 95% CI 1.7–44.; $p < 0.000$), which was mostly mucopurulent (37% v 10%, OR 3.0, 95% CI 1.3–6.1, $p < 0.000$).

C trachomatis positive women significantly more often had concomitant infections with *T vaginalis* (7.1% v 2.5%, OR 2.9, 95% CI 1.1–7.1, $p = 0.02$) and *N gonorrhoeae* (2.4% v 0.3%, OR 7.3, 95% CI 1.0–45.1, $p = 0.02$), as well as bacterial vaginosis (21.2% v 13.5%, OR 1.7, 95% CI 1.0–2.9, $p = 0.05$) and cervicitis (52.9% v 10.5%, R 9.6, 95% CI 6.0–15.5, $p = 0.00$). There was no significant difference in the number of candida infections or the finding of urethritis between *C trachomatis* positive and negative women.

Discussion

In the present study we found the prevalence of *C trachomatis* infection to vary between six different healthcare units from 4% to 13.5%. This difference was not caused by differences in reasons for visiting but by the proportion of visitors below 19 years of age. This group had a prevalence five to eight times greater than that of the following 5 years age groups. In a previous study conducted on the female population in Klaipeda,² the prevalence peak was at 24 years of age. This exemplifies that when tailoring prevention programmes one has to be aware of the age specific prevalence.

In this study smoking was associated with chlamydial infection. Probably smoking itself was not a risk factor, but smoking women significantly more often had had more than two sexual partners during the last 6 and 12 months. They also became sexually active earlier—that is, smokers belong to a group with “risky behaviour,” a fact also noted by others.³

The presence of current symptoms or a history of reproductive tract infections did not influence the presence or absence of *C trachomatis* infections in the present study. This could reflect the women's awareness of symptomatology in general.

Cervical discharge, especially of a mucopurulent character,^{4,5} is a well known marker for having genital chlamydial infection. These signs were significantly more often expressed in *C trachomatis* positive women in this study.

Since most STDs have common risk factors, anyone with one infection diagnosed is at higher risk of having several infections.⁶ This is also supported by the present study.

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Conflict of interest: none.

Contributors: MD initiated, designed and supervised the study, worked on this paper, and conducted statistical analysis; AH co-supervised the study and was working on the manuscript; RB was helping with the study design, its technical performance, data computing and interpretation; TS and VJ were helping with the study design, its laboratory performance, and interpretation; DM, RJ, VP, JB, and MG were responsible for sample collection and evaluation at the study site.

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