Current characteristics of male gonorrhoea outpatients in Athens, Greece

K P Kyriakis, E Tzelepi, H Avgerinou, L S Tzouvelekis, A Flemetakis, E Frangouli

Monitoring the temporal alterations in sociodemographic and behavioural patient characteristics might be useful to evaluate and improve the STD prevention programmes and to elucidate changes in sexual activity in the population.¹ In Greece gonorrhoea surveillance data are retrieved from the public STD hospitals as described elsewhere.²

Since 1990 an influx of approximately one million economic refugees from eastern Europe, Africa, and Asia have entered Greece and their gonorrhoea related epidemiological characteristics were unknown. Analysed data concern both immigrant and Greek heterosexuals and men having sex with men (MSM). Women were excluded from the study because of their small number ($n=10$) possibly as a result of the lack of an established partner notification system.²

METHODS

The participants of this cross sectional hospital based study ("A Sygros") were 280 consecutive symptomatic gonorrhoea male cases, diagnosed on the basis of symptoms, Gram staining, and culture (97.5% of cases were culture positive). This sentinel sample includes all cases diagnosed in a 3 year period (1999–2001).

Epidemiological variables were collected on the basis of a standardised questionnaire that included age, nationality, residence, socioeconomic class (table 1), previous STD history, the suspected source of infection categorisation, marital status, number of sexual partners in the past 6 months,³ sexual orientation (heterosexuals and MSM), health seeking behaviour (time between the onset of clinically apparent disease and the seeking of medical assistance), and reporting of having sex while symptomatic and before seeking treatment (infectious contacts). Quantitative data were analysed by the unpaired t test. Categorical data comparisons were carried out by Mantel-Haenszel stratified and 2×2 χ^2 procedures or Fisher exact

test as appropriate. Respective odds ratios (ORs) and their Cornfield 95% confidence intervals (CI) were evaluated. The influence of independent on dichotomous dependent variables was evaluated by logistic regression analysis. Current data were compared with those of the early 1990s (1990–6) to detect significant changes.²

RESULTS

Gonorrhoea in heterosexuals

Overall, in both heterosexual groups, marital status, disease/STD repeaters, health seeking behaviour, and infectious contacts were homogeneously distributed (table 1).

Socioeconomic class was heterogeneously distributed. Morbidity prevailed among Greek cases, when first three classes were taken together (χ^2 , Yates's corrected, $p=0.0006$, OR 5.24, 1.8–16), followed by a significantly higher morbidity rate among unemployed immigrants (Fisher exact test, $p=0.003$, OR=5.3, 1.6–17.6) and an equal frequency among fourth class participants (manual workers, etc) (table 1). Moreover, immigrants were younger (t test, $p=0.001$), and they were more frequently infected from sex workers than Greek heterosexuals (χ^2 , Yates's corrected $p=0.0004$, OR 3.5, 1.7–7.4) (table 1). The geographic origin of heterosexual immigrants was 15 (34.9%) from Albania, eight (18.6%) Middle East, eight (18.6%) Indian Subcontinent, six (13.9%) eastern Europe, five (11.6%) South East Asia, and one unknown.

Married patients were older than single patients (mean (SEM), 38.4 (1.5), $n=53$ v 30.1 (0.8) years, $p<0.0001$, 95% CI of the difference 5.1 to 11.4 years, t test), so were disease/STD repeaters (39.3 (1.8) years $n=52$, v 29.9 (0.66) years, $p<0.0001$, t test, 95% CI of the difference 6.4 to 12.8 years).

Men having sex with men

Greek MSM compared with Greek heterosexuals, were younger (table 1, $p=0.01$, t test), exhibited a higher morbidity among first class participants

(χ^2 , Yates's corrected, $p=0.0005$ OR 3.5, 95% CI 1.6 to 7.5), and a lower morbidity among fourth class ($p=0.01$, OR 2.3, 95% CI 1.2 to 5.4). A significantly higher number of disease/STD repeaters was observed in Greek MSM than in heterosexuals (table 1, χ^2 , Yates's corrected, $p=0.02$, OR 2.1 95% CI 1.1 to 4.2). Among Greek MSM, disease/STD repeaters were significantly older than first time patients (mean (SEM), 32.7 (1.6), $n=23$ v 27.2 (0.9), $p=0.002$, t test, 95% CI of difference 2.1 to 8.9 years) but also significantly younger than Greek heterosexual repeaters (mean (SEM), 40.2 (2) years, $n=46$, $p=0.02$, t test, 95% CI of difference 1.2 to 13.6 years).

The geographic origin of immigrant MSM was five (50%) from Albania, three (30%) Indian subcontinent, one (10%) eastern Europe, and one (10%) Middle East. These cases did not differ from their Greek counterparts or immigrant heterosexuals regarding age, partner change rate and health seeking behaviour.

Source of infection categorisation, health seeking behaviour and contact(s) after symptomatic gonorrhoea onset, were found to be unrelated to sexual orientation (table 1).

Irrespective of sexual orientation, the occurrence of contact(s) while symptomatic and before seeking treatment was found significantly influenced by clinically apparent disease duration (logistic regression, $p<0.0001$, OR 2.4, 95% CI 1.6 to 3.6) as well as by higher partner change rate (logistic regression, $p=0.01$, OR 1.4, 95% CI 1.06 to 1.86). The latter remained stable even after controlling for disease duration.

Epidemiological characteristics over time

For the period 1990–2001, trend analysis, based on least squares, showed that male gonorrhoea yearly case detection rate remained constant (median 85 cases, range 62–127).

The age of Greek male heterosexuals has significantly increased when compared with the 1990–6 period (29.1 (8.8) years, $n=334$, unpaired t test, $p<0.0001$, mean difference 4.1 years, 95% CI 2.4 to 6). Health seeking behaviour and the distribution of cases by social class have remained constant.²

Between the years 1984–96, 57 patients (5.5%, 57/1031) were self reported as MSM,² while in the period studied this relative frequency rose to 68 patients (24.3%, 68/280), roughly representing a fivefold increase of gonorrhoea case detection rate among MSM, within a much shorter period of time (χ^2 , Yates's corrected, $p<10^{-9}$, OR 5.5, 95% CI 3.7 to 8.2). The percentage of MSM in male cases increased abruptly from 12.7% in 1996 to 25% in 1997 and remained constant thereafter (χ^2 , 1997–2001 cumulative frequency 22.8%, data not shown).

Table 1 Sociodemographic and behavioural characteristics of male gonorrhoea cases in "A Sygros" Hospital, Athens, Greece, by sexual orientation and nationality (1999–2001, three years)

Patient characteristics	Heterosexuals		Homo/bisexuals	
	HS-GR† (n=169)	HS-IM‡ (n=43)	MSM-GR (n=58)	MSM-IM (n=10)
(1) Age (years)				
Mean (SD) (range)	33.3 (11.1) (18–77)	28.0 (7.3) (17–54)	29.6 (7.3) (19–55)	26.0 (5.4) (19–35)
(2) Married, No (%)	43 (25.4)	10 (23.3)	3 (5.2)	0
(3) Socioeconomic class, No (%)				
1	22 (13.0)	2 (4.6)	20 (34.5)	0
2	16 (9.5)	0	4 (6.9)	0
3	31 (18.3)	3 (7.0)	9 (15.5)	1 (10.0)
4	93 (55.0)	30 (69.8)	20 (34.5)	6 (60.0)
5	7 (4.2)	8 (18.6)	5 (8.6)	3 (30.0)
(4) Number of partners, No (%)				
1	34 (20.9)	12 (27.9)	15 (25.9)	3 (30.0)
2–4	79 (46.7)	17 (39.6)	19 (32.8)	2 (20.0)
5–9	21 (12.4)	9 (20.9)	10 (17.2)	1 (10.0)
≥10	35 (20.7)	5 (11.6)	14 (24.1)	4 (40.0)
Mean (SD) (range)	5.13 (7.63) (1–60)	6.52 (15.8) (1–100)	6.9 (10.5) (1–50)	12.4 (18.3) (1–60)
(5) Health seeking behaviour (days)				
Mean (SD) (range)	8.8 (16.6) (1–180)	9.1 (8.0) (1–30)	6.3 (4.2) (1–25)	5.2 (4.2) (2–15)
<8 days, No (%)	123 (72.8)	26 (60.5)	43 (74.1)	8 (80.0)
≥8 days, No (%)	46 (27.2)	17 (39.5)	15 (25.9)	2 (20)
(6) Source of infection, No (%)				
SP-SN	30 (17.8)	3 (7.0)	19 (32.8)	1 (10.0)
SP-ON	6 (3.5)	1 (2.3)	1 (1.7)	0
CP-SN	60 (35.5)	4 (9.3)	22 (37.9)	0
CP-ON	25 (14.8)	10 (23.3)	3 (5.2)	4 (40.0)
HRP	48 (28.4)	25 (58.1)	13 (22.4)	5 (50.0)
(7) Infectious contact(s), No (%)	40 (23.7)	6 (14.0)	14 (24.1)	0
(8) STD history:				
Gonorrhoea	37 (21.9)	6 (14.0)	15 (25.9)	–
Syphilis	4 (2.4)	–	1 (1.7)	–
AIDS	–	–	8 (13.8)	–
Genital warts	4 (2.4)	–	4 (6.9)	–
NGU	1 (0.6)	–	–	–
Disease/STD repeaters, No (%)	46 (27.2)	6 (14.0)	23 (39.7)*	0

†Heterosexual-Greek; ‡Heterosexual-Immigrants. *Socioeconomic class*: class 1, scientists, artists, intellectuals, college or university students; class 2, public servants; class 3, self employed individuals; class 4, office clerks, salesmen, manual workers, and seamen; class 5, unemployed people. *Source of infection*: SP, steady partner; CP, casual partner; SN, same nationality; ON, other nationality; HRP, high risk partnership(s), eg, sex-worker. *STD history*: NGU non-gonococcal urethritis; In MSM disease/STD repeaters* there were cases with multiple STD diagnoses in the past.

DISCUSSION

The increasing age trend among Greek heterosexuals was initially observed in the early 1990s in accordance with other European sentinel populations.^{1,2} It is possibly related to gonorrhoea confinement in core or core related individuals, as implied by a stably higher percentage of low socioeconomic class participants.⁴ Increasing age trend among Greek heterosexuals indicates that young people successfully adopt and maintain low risk sexual behaviour leading to a stable disease intensity in the community, despite an increased incidence among MSM and the influx of immigrants. In terms of night time sociosexual activity, among older heterosexuals many cases should be considered as core group peripherals or adjacents, as indicated by the older age of disease/STD repeaters.⁴

Core group-like sexual behaviour was clearly detected by the association of high rates of partner change with contact(s) while symptomatic and before treatment, which corresponds to high frequency transmitters and/or core group bridges sustaining the disease in the population.⁵

Irrespective of sexual orientation, a delayed health seeking behaviour also resulted in potentially infectious contacts. Contrary to the previously held impression, this behaviour was found unrelated to promiscuity and older age.^{6,7}

Gonorrhoea incidence increased abruptly among MSM in Athens in 1997—that is, 1 year after the introduction of protease inhibitors, in line with other European countries⁸ and despite opposite trends in the recent past (1990–6).⁹ Especially among higher socioeconomic class Greek MSM, optimism about new HIV/AIDS treatments¹⁰ possibly accelerated the occurrence of “safer sex fatigue.” In this context, a core of homosexually active men is implied by the higher frequency of repeaters and their younger age compared with heterosexuals. In our MSM series urethral gonorrhoea prevailed. As previously reported, this diagnosis was associated with oral insertive intercourse commonly thought to be a “safe” sexual practice, as well as with unprotected anal insertive intercourse and HIV infection.¹¹

Our findings correspond to a transitional period when a recurrence of high risk sexual behaviour among MSM in

Greece should be expected. The above new disease dynamics require innovative preventive interventions targeting core related individuals (MSM, immigrants, older, and multipartner cases).

CONTRIBUTORS

KPK, principal investigator, responsible for the study design, statistical and epidemiological data analysis, interpretation of results and manuscript preparation; ET, study design, literature research, coordinator of gonorrhoea surveillance activities; HA, AF, and EF, microbiological diagnosis, patient interviewing and valuable, interactive field researchers in gonorrhoea surveillance for many years; LST, critical review of the article and experienced contribution in gonorrhoea surveillance and research for many years.

Sex Transm Infect 2002;**78**:e5
(<http://www.sextransinf.com/cgi/content/full/78/4/e5>)

Authors' affiliations

K P Kyriakis, E Tzelepi, L S Tzouvelekis, National Reference Centre for Neisseria gonorrhoeae, Department of Bacteriology, Hellenic Pasteur Institute, Athens
H Avgerinou, A Flietakis, E Frangouli, Microbiology Department of the “Andreas Sygros” Hospital for Skin and Venereal Diseases, Athens, Greece

Correspondence: Kyriakos P Kyriakis, MD, National Reference Centre for Neisseria gonorrhoeae, Department of Bacteriology, Hellenic Pasteur Institute, 127 Vass Sofias, 11521-Athens, Greece; tzelepi@mail.pasteur.gr

Accepted for publication 11 April 2002

REFERENCES

- 1 **Van der Heyden JHA**, Catchpole MA, Paget WJ, *et al*, and the European Study Group. Trends in gonorrhoea in nine western European countries, 1991–6. *Sex Transm Infect* 2000;**76**:110–16.
- 2 **Kyriakis KP**, Tzelepi E, Flemetakis A, *et al*. Epidemiological aspects of male gonococcal infection in Greece. *Sex Transm Dis* 1999;**26**:43–8.
- 3 **Catchpole MA**. The role of epidemiology and surveillance systems in the control of sexually transmitted diseases. *Genitourin Med* 1996;**72**:321–9.
- 4 **Barnes RC**, Holmes KK. Epidemiology of gonorrhea: current perspectives. *Epidemiol Rev* 1984;**6**:1–30.
- 5 **Aral SO**. Sexual network patterns as determinants of STD rates: paradigm shift in the behavioural epidemiology of STDs made visible. *Sex Transm Dis* 1999;**26**:262–4.
- 6 **Gott CM**, Rogstad KE, Riley V, *et al*. Delay in symptom presentation among a sample of older clinic attenders. *Int J STD AIDS* 1999;**10**:43–9.
- 7 **Hook ED 3rd**, Richey CM, Leone P, *et al*. Delayed presentation to clinics for sexually transmitted diseases by symptomatic patients. A potential contributor to continuing STD morbidity. *Sex Transm Dis* 1997;**24**:443–8.
- 8 **Goulet V**, Sednaoui P, Laporte A, *et al*. The number of gonococcal infections identified by the RENAGO network is increasing. *Eurosurveillance* 2000;**5**:2–5.
- 9 **Kyriakis KP**, Hadjivassiliou M. HIV-1 infection associated risk factors among sexually transmitted disease patients in Athens, Greece: 1990–1996. *Sex Transm Dis* 2000;**27**:259–65.
- 10 **Van de Ven P**, Kippax S, Knox S, *et al*. HIV treatments optimism and sexual behaviour among gay men in Sydney and Melbourne. *AIDS* 1999;**13**:2289–94.
- 11 **Lafferty WE**, Hughes JP, Hunter-Handsfield H. Sexually transmitted diseases in men who have sex with men. Acquisition of gonorrhea and nongonococcal urethritis by fellatio and implications for STD/HIV prevention. *Sex Transm Dis* 1997;**24**:272–8.