

## SHORT REPORT

## Re-emerging syphilis in gay men: a case-control study of behavioural risk factors and HIV status

M A Bellis, P Cook, P Clark, Q Syed, A Hoskins

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Over the later half of the 20th century levels of syphilis dropped dramatically in western European countries. Between 1990 and 1998, an area such as Greater Manchester in the UK (population, 2.7 million) reported fewer than 10 cases per year. In contrast, between January 1999 and May 2001 120 cases of syphilis were reported in Greater Manchester. Other areas within the UK (Brighton, Peterborough and Cambridgeshire), elsewhere in Europe (Dublin and Paris)<sup>1</sup> and in the USA (Southern California),<sup>2</sup> have recently experienced outbreaks of syphilis. Although epidemiological information on cases has been collected in some settings, controlled studies are urgently required in order to identify behaviours specifically associated with re-emerging syphilis. Here, we present results from such a case-control study.

## METHODS AND RESULTS

Of 58 diagnosed cases of syphilis in Greater Manchester (May 1999 and August 2000), 38 were approached through genitourinary medicine clinics to participate in a structured interview regarding their sexual, social, and drug using behaviour during 12 months before syphilis diagnosis. Characteristics of the 27 people (71.05% compliance) who agreed to participate were 96.30% male, 85.18% homosexual, and 25.93% previously having been diagnosed HIV positive. All cases had tested positive for syphilis using a Treponema

Pallidum Haemagglutination Assay and were in either primary (n=22) or secondary (n=5) stages of the disease. For sex, sexuality and HIV cases were representative of the outbreak to date. Controls were recruited (December 1999 to August 2000) for only homosexual individuals (n=23), as heterosexual cases were considered too few for analysis. Most controls were contacted through gay and HIV voluntary groups (compliance 44 of 85 contacts) with a further 18 controls recruited directly within known gay social areas (compliance 18 of 42 contacts). Controls were selected to provide an overall match for the age, sex (all male), area of residence (first part of postcode), sexual preference (all homosexual) and ethnic characteristics (all white) of the case group. For the purposes of analysis, cases and controls are separated into HIV positive and negative groups (table 1). Comparisons between these four groups use  $\chi^2$  and Mann-Whitney U tests. Overall case-control comparisons use stratified (by HIV status)  $\chi^2$  and a multifactor extension of the Kruskal-Wallis test.<sup>3</sup>

Cases had significantly more partners and new partners after controlling for HIV status (table 1). Proportions of anonymous partners, partners of unknown HIV status and numbers of oral sex partners were also higher. Cases were more likely to use darkrooms (private rooms set up specifically for sex), go cruising (use outdoor areas for sex) and use saunas to find partners. A higher proportion of cases used the drugs GHB (gamma hydroxybutyrate) and poppers (amyl nitrate).

**Table 1** Comparison of case and control group behaviour over 12 month periods

Factor	Cases		Controls		Cases versus controls p
	A Syphilis only	B Syphilis and HIV	C HIV only	D No infection	
Number	16	7	13	49	
<i>Medians</i>					
Age	30.5	30.0	30.0	31.0	0.518
Number of sexual partners	30.0	30.0	25.0	5.0 <sup>ab,c</sup>	0.022
Number of new partners	23.0	30.0	20.0	5.0 <sup>ab,c</sup>	0.033
Number of anal sex partners	4.0	15.0	16.0	3.0 <sup>bc</sup>	0.752
Number of oral sex partners	30.0	30.0	10.0	5.0 <sup>ab</sup>	0.003
% of sex partners anonymous	89.2	91.7	70.0	50.0 <sup>ab</sup>	0.002
% of sex partners of known HIV status	0.0	8.0 <sup>a</sup>	10.0 <sup>a</sup>	16.7 <sup>a</sup>	0.011
<i>Percentages</i>					
Had anal sex without a condom	75.0	71.4	61.5	54.2	0.12
Never use condoms for oral sex	100.0	85.7	92.3	89.6	0.323
Always request condom for anal sex	18.8	0.0	46.2 <sup>b</sup>	46.9 <sup>ab</sup>	0.005
Had partner refuse condom for anal sex	18.8	42.9	61.5 <sup>a</sup>	18.8 <sup>a</sup>	0.639
Use darkrooms to find partners	68.8	42.9	61.5	28.6 <sup>ac</sup>	0.045
Go cottaging to find partners	43.8	14.3	61.5 <sup>b</sup>	18.4 <sup>ac</sup>	0.619
Go cruising to find partners	71.4	68.8	61.5	36.7 <sup>a</sup>	0.031
Use saunas to find partners	37.5	14.3	69.2 <sup>b</sup>	53.1	0.032
Go abroad to find partners	37.5	28.6	46.2	6.1 <sup>ac</sup>	0.061
Used GHB (gamma hydroxybutyrate)	56.3	71.4	61.5	18.4 <sup>ab,c</sup>	0.007
Used amphetamine	56.3	57.1	61.5	34.7	0.229
Used poppers (amyl nitrate)	93.8	100.0	100.0	67.3 <sup>ac</sup>	0.037
Used cocaine	56.3	28.6	46.2	34.7	0.367

Summaries of continuous variables are presented as median values while percentages are used to summarise dichotomous data. Superscripts a, b and c are used to identify groups differing significantly ( $p < 0.05$ ) from syphilis only, syphilis and HIV and HIV only groups respectively. An overall statistical comparison between all cases and all controls is given in the final column and uses a multifactor extension of Kruskal-Wallis or stratified  $\chi^2$  tests to control for confounding relations with HIV status.

## COMMENT

Results indicate a strong association between syphilis infection and unprotected oral sex (receptive or insertive) with high numbers of partners; with cases having 30 (median) oral sex partners per year (range 1–500). Partners were predominantly anonymous making contact tracing impossible. However, results identified specific venues (dark-rooms, cruising areas, and saunas) where individuals with syphilis sought sexual partners. Such areas must form a focus for initiatives to increase understanding around the risks of oral syphilis transmission and to identify new cases.

The strong overlap between HIV and syphilis is a particular concern as syphilis infection may increase the likelihood of HIV transmission.<sup>4</sup> Moreover, individuals with HIV had higher numbers of anal sex partners (than those with neither infection) with most individuals having sex anonymously and failing to use condoms consistently (table 1). Individuals with HIV were most likely to have had partners refuse to wear condoms for anal sex suggesting complacency may have arisen regarding unprotected anal sex and HIV transmission.

Those with HIV were more likely (than those with neither infection) to use darkrooms and cottages (public toilets) to meet new partners. These settings should be used to target interventions to reduce high risk sexual behaviours. Furthermore, relations between both HIV and syphilis infection and travel abroad requires more public health work with the travel industry.<sup>5</sup>

This study also identified a strong relation between GHB use and both syphilis and HIV infection. GHB increases confidence and reduces inhibitions and may reduce the impact of safe sex messages. Consequently, forthcoming strategies to control sexually transmitted infections<sup>6</sup> should emphasise multidisciplinary approaches to unsafe sex and substance use.

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## Authors' affiliations

**M A Bellis, P Cook, P Clark**, North West Public Health Observatory, Public Health Sector, School of Health and Human Sciences, Liverpool, UK

**Q Syed**, Communicable Disease Surveillance Centre, North West, Chester, UK

**A Hoskins**, Manchester Health Authority, Manchester, UK

Correspondence to: Professor M A Bellis, North West Public Health Observatory, Public Health Sector, School of Health and Human Sciences, 70 Great Crosshall Street, Liverpool L3 2AB, UK; m.a.bellis@livjm.ac.uk

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