

Behavioural and Social Characteristics of Subjects with Repeated Sexually Transmitted Diseases

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A case-control study was performed in order to assess risk factors for repeated sexually transmitted diseases. The study comprised 101 patients who had had sexually transmitted diseases 3 or more times during their lives and 182 controls who had no history of sexually transmitted disease. The subjects all attended the City Department for Skin and Venereal Diseases in Belgrade, Yugoslavia, from June 1997 to April 1998. According to multivariate logistic regression analysis, sexually transmitted diseases repeaters, in comparison with the controls, were older, more frequently divorced and widowed and without a regular partner, had more sexual partners and more sexual intercourse, and had more frequent sexual contact with people on the same day as meeting them. They also consumed alcohol, used sedatives and were prosecuted for criminal offences more frequently than the controls. The results of this study support the hypothesis that sexually transmitted diseases repeaters are different from their controls in terms of their behavioural and social characteristics. Key words: risk factors; case-control study; epidemiology.

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Sexually transmitted diseases (STDs) comprise a large group of infections produced by different microorganisms, including spirochetes, bacteria, chlamydia, mycoplasma, protozoa, fungi, parasites and viruses.

Worldwide on an average it is estimated that 685,000 people are infected with STDs every day. According to Khanna et al. (1), every year there are 250 million new cases. There are no data about the frequency of all STDs in the Belgrade population, but Bjekić et al. (2) found that during the period 1988–94, the age-standardized incidence of gonorrhoea, per 100,000 population was 48.6 for men and 14.6 for women. As shown by Bjekić (3), in the same period the age-standardized incidence of syphilis was 2.5 per 100,000.

A considerable number of sexually transmitted diseases patients are STD repeaters. As reported by Marjanović & Lalošević (4), in Belgrade, among men who during the years 1985 and 1986 visited City Department for Skin and Venereal Diseases, because of syphilis or gonorrhoea, 29% had these diseases 2 or more times during their lives. According to Bjekić et al. (5), of male patients who, from October 1993 to December 1994, visited the same institution because of gonorrhoea, about 50% reported previous STD in their personal histories. In the study by Richert et al. (6) more than 30% of all patients who in 1 year visited an STD clinic in Dade County, Florida, USA, returned with a new infection

within 3 years of their index visit. According to Brooks et al. (7) investigation gonorrhoea repeaters constituted an extremely small segment of the population, but yielded a large proportion of the morbidity due to gonorrhoea in Indianapolis, Marion County, USA. If re-infections had been prevented, gonorrhoea morbidity among patients of the clinic could have been decreased by 16%.

The aim of this study was to test the hypothesis that STD repeaters were different in terms of behavioural and social characteristics from subjects who had no STD in their personal histories.

MATERIAL AND METHODS

The case-control study was performed in the population of Belgrade, Yugoslavia, from June 1997 to April 1998.

Subjects were recruited from among patients attending the City Department for Skin and Venereal Diseases of Belgrade because of STD (syphilis, gonorrhoea, non-gonococcal urethritis or genital warts). The study comprised 101 consecutive patients, who according to their personal histories had already had STD 2 or more times. Including the last infection, 65% of cases had STD 3 times, 30% had it 4 times and 5% had STD 5 or more times in their lifetime. Urethral specimens have been used for the diagnosis of gonorrhoea (Gram-stain, culture-modified Thayer-Martin medium) and chlamydia (enzyme immunoassay). Direct microscopic examination by saline wet mount for trichomonas and candida were performed. Venereal Disease Research Laboratory (VDRL) and Treponema Pallidum haemagglutination test (TPHA) were used for the diagnosis of syphilis. Genital warts were diagnosed clinically.

The control group comprised 182 consecutive patients treated at the same institution for micotic diseases and who in their personal histories had never had STD.

All participants were men aged 20–50 years and all were from Belgrade.

Data on demographic characteristics, sexual history and sexual behaviour, as well as data on use of sedatives, smoking habits and sports activities, and data on antisocial behaviour (alcohol use, prostitution, drug use, prosecution for minor and criminal offences) were collected from all participants by using an anonymous questionnaire. Participants completed interviews while waiting for laboratory results. None of them refused cooperation.

In the analysis of data univariate and multivariate logistic regression analyses were applied.

RESULTS

Demographic characteristics of STD repeaters and their controls are presented in Table I. According to univariate logistic regression analysis, in comparison with controls, STD repeaters were significantly older and with lower educational level, they also were more frequently divorced and widowed, and were more frequently service sector workers. At the time of interview 38.6% of STD repeaters and 28.6% of controls were not employed ($p=0.0008$). Out of these, 90% of

Table I. Demographic characteristics of STD repeaters and their controls (*p* values according to age-adjusted univariate logistic regression analysis)

Variable	STD repeaters (no./%)	Controls (no./%)	<i>p</i> value
Age (years)			
20–25	11/10.9	64/35.2	
26–30	24/23.8	40/22.0	
31–35	22/21.8	31/17.0	
36–40	23/22.8	24/13.2	
41–45	14/13.9	13/7.1	
46–50	7/6.8	10/5.5	0.0001
Marital status			
Never married	53/52.5	104/57.1	
Married	25/24.7	76/41.8	
Divorced and widowed	23/22.8	2/1.1	<0.0001
Education			
Elementary	8/7.9	3/1.7	
Secondary	73/72.3	136/67.0	
High	20/19.8	57/31.3	0.0001
Occupation			
Industrial worker	30/29.7	52/28.6	
Service sector worker	24/23.7 ^a	18/9.9	0.0008
Trade worker	7/6.9	10/5.5	
White collar worker	29/28.7	72/39.5	
Other	6/6.1	12/6.6	
Supported person (student)	5/4.9	18/9.9	

^aIn comparison with all other occupational groups.

repeaters and 52% of controls left their jobs by choice ($p=0.0032$); for STD repeaters the main reason was conflict with the employer, and for controls, low salary and dissatisfaction with the type of work.

The majority of both cases and controls had had their first sexual intercourse in the age range 15–19 years (Table II). A significantly greater percentage of STD repeaters than controls began sexual activity before age of 15 years, whereas a greater percentage of controls had their first sexual intercourse when 20 or more years old. A greater percentage of STD repeaters had sex for money and had sexual contacts on the same day as meeting a person. Anal sex was also reported more frequently among STD repeaters. Use of condoms was less frequent among STD repeaters than among controls. The number of participants who had homosexual or bisexual partners was small, higher among STD repeaters than among controls, but the difference was not significant. In comparison with controls, STD repeaters had a significantly greater number of sexual partners in the past year (number of sexual partners in the past year was used instead of number of partners during the lifetime, as it is regarded as more reliable) and had more sexual intercourse in the past month. STD repeaters were also more frequently without a regular partner in the past year.

The majority (about 80%) of all participants showed sufficient knowledge of STDs and their complications. More than 60% of participants, cases and controls, were afraid of STD and about 70% reported changes in sexual behaviour because of AIDS. In most the change comprised more frequent use of condoms and avoidance of “risky” sex (sex for money, sex on first day of meeting, high number of partners).

Alcohol consumption, smoking, drug use and use of sedatives were significantly more frequent in STD repeaters

in comparison with their controls (Table III), but there were no differences in the quantity or in the length of time they were used. Repeaters used hard drinks more frequently than controls and more than half of them reported consumption of alcohol at the time of infection. Significantly greater number of controls reported taking part in sports activities. STD repeaters were more frequently prosecuted for minor and criminal offences. A greater percentage of them abandoned their families once or on several occasions, although the difference was not significant.

All variables that were related to repeated STD at a level of $p<0.05$ according to univariate analysis were included in the multivariate logistic regression model. According to multivariate analysis the following factors were significantly related to repeated STD: older age, greater number of sexual partners in the past year, greater frequency of sexual intercourse in the past month, sexual contact on the same day as meeting and alcohol consumption. STD repeaters also were significantly more frequently divorced or widowed and without a regular sexual partner, and were more frequently prosecuted for criminal offences. The use of sedatives was independently, but not significantly, related to repeated STD (Table IV).

DISCUSSION

The present study was performed in order to test the hypothesis that STD repeaters differ in terms of behavioural and social characteristics from subjects who have never had STD. The results obtained support this hypothesis.

Since in this study the frequency of STD was observed during the subjects lifetimes, the fact that STD repeaters tended to be older than controls could be explained by their longer sexual activity (they also began sexual behaviour earlier) and consequently higher exposure. In the study of

Table II. Sexual behaviour and sexual activity of STD repeaters and their controls (*p* values according to age-adjusted univariate logistic regression analysis)

Variable	STD repeaters (no./%)	Controls (no./%)	<i>p</i> value
Age at first sexual intercourse (years)			
<15	14/13.9*	6/3.3	0.0039
15–19	82/81.2	146/80.2	
20–29	5/5.0	33/16.5**	0.0013
Sex for money	18/17.8	5/2.7	0.0001
Sexual contact same day as meeting	97/96.3	51/28.0	<0.0001
Anal sexual intercourse	38/37.6	18/9.9	<0.0001
Condom use			
Never or sometimes	84/83.1	117/64.3	
With unknown partner only or always	17/16.9	65/35.7	0.0073
Homosexual or bisexual partner	5/5.0	3/1.6	0.0942
Regular partner in the past year	57/56.4	142/78.0	<0.0001
No of sexual partners in the past year			
<2	12/11.9	138/75.8	
3–5	42/41.6	31/17.0	
6–9	21/20.8	7/3.8	
10+	26/25.7	6/3.3	<0.0001
Frequency of sexual intercourse in the past month			
None	1/1.0	52/28.6	
1 per week	25/24.7	41/22.5	
2–3 per week	64/63.4	78/42.9	
Every day	11/10.9	11/6.0	<0.0001

*In comparison with all older subjects.

**In comparison with all younger subjects.

Richert et al. (6), the highest percentage of white male patients returning within a year with a new STD was in the age group 45–49 years, whereas, for black males the return rate was highest in the age group 15–19 years.

Out of sexual behaviour factors, the absence of a regular partner, a greater number of partners and of sexual intercourse and sexual contact on the same day as meeting a partner were independently related to repeated STD. Hook et al.'s (8) findings are similar. According to Upchurch et al. (9), repeated gonorrhoea was related to a higher number of sexual partners in the last month, new partners and prostitution.

In this study other independent risk factors for repeated STD were alcohol consumption and criminal offences.

Scheidt & Windle (10) found that 60% of alcoholics had at least 1 STD as the result of having a high number of sexual partners, low use of condoms and practising sex for drugs or money.

Lundin et al. (11) found that repeat venereal disease

patients (patients having 4 or more infections during a 2-year period) had a significantly higher proportion of admission to clinic than had non-repeaters (patients having 1 reported venereal infection during the same period), because of problems with alcohol, injuries sustained in physical conflict, psychiatric disorders and involvement with the police with resulting injuries. The STD repeaters also frequently changed their address, the main reasons for being; difficulties in meeting their rent payments; conflicts with landlords; loss of job; or moving in search of new employment. STD repeaters in the present study left their job most frequently because of conflicts with employer.

In Steiner et al.'s study (12) high-risk sexual behaviour was directly associated with a history of being arrested. In the present study, among STD repeaters 58% were prosecuted for minor offences (one-third because of violent behaviour and public disturbance) and 25% were prosecuted for criminal offences.

In studies by Rolfs et al. (13), Hibbs & Gunn (14),

Table III. Some other characteristics of STD repeaters and their controls (*p* values according to age-adjusted univariate logistic regression analysis)

Variable	STD repeaters (no./%) n = 101	Controls (no./%) n = 182	<i>p</i> value
Alcohol consumption	57/56.4	30/16.5	<0.0001
Smoking	61/60.4	81/44.5	0.0038
Sports activities	34/33.7	116/63.7	<0.0001
Drug use	19/18.8	7/3.8	<0.0001
Use of sedative	18/17.8	3/1.6	<0.0001
Prosecution for minor offence	59/58.4	43/23.6	<0.0001
Prosecution for criminal offence	25/24.8	6/3.3	<0.0001
Abandonment of the family	10/9.9	7/3.8	0.0791

Table IV. Factors associated with repeated STD according to multiple logistic regression analysis.

Variable	Coefficient	Standard error	Odds ratio	95% confidence interval
Age	0.1274	0.0382	1.14	1.05–1.22
Divorced and widowed	1.4731	0.6186	4.36	1.30–14.67
Regular partner	–1.4283	0.5621	0.24	0.08–0.72
No. of sexual partners in the past year (categories 0, 1, 2, 3) ^a	0.8549	0.2639	2.35	1.40–3.94
Frequency of sexual intercourse in the past month (categories 0, 1, 2, 3) ^b	1.0534	0.4787	2.87	1.12–7.33
Sexual contact on the same day as meeting	2.9704	0.6445	19.50	5.51–68.96
Alcohol consumption	0.9245	0.4615	2.52	1.02–6.23
Use of sedatives	1.5457	0.8962	4.69	0.81–27.17
Prosecution for criminal offence	2.9276	0.8385	18.68	3.61–96.64
Constant	–8.8849	1.6678		

^aCategory 0 denotes ≤ 2 partners; category 1 denotes 3–5 partners; category 2 denotes 6–9 partners; category 3 denotes ≥ 10 partners.

^bCategory 0 denotes no sexual intercourse; category 1 denotes intercourse once per week; category 2 denotes intercourse 2–3 times per week; category 3 denotes intercourse every day.

Upchurch et al. (9), Inciardi (15), Cleghorn et al. (16) and Kim et al. (17), STDs were related to drug use. While most of the subjects developed sexual disinterest and dysfunction with prolonged use of crack cocaine, some of them become more sexually promiscuous and consequently contracted STDs more often.

In the present study STD repeaters in comparison with the controls were significantly more frequently drug users (the majority of them inhaled drugs), but the relationship between drug use and repeated STD was not independent. Independent, though non-significant correlation was found between repeated STD and the use of sedatives. There are no literature data about this relationship. However, since sedatives, similarly to drugs, affect the central nervous system, they can also influence sexual behaviour. As Petrović (18) showed, higher doses of sedatives reduce libido, but moderate doses that reduce anxiety improve sexual function and sexual gratification.

The results of the present study support the hypothesis that STD repeaters are different from their controls in terms of behavioural and social characteristics.

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