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SHORT SUMMARY

In a cross-sectional study, MSM with LGV proctitis, gonorrheal proctitis and proctitis of unknown etiology exhibit high-risk behavior. LGV proctitis was strongly associated with anal enema use.

ABSTRACT

OBJECTIVES: In the industrialized world, lymphogranuloma venereum proctitis (LGVP) has been only reported in men who have sex with men. Factors responsible for the outbreak remain to be elucidated.

GOAL: To elucidate risk factors associated with LGVP.

STUDY DESIGN: A cross-sectional study including 32 men with LGVP and 93 men without LGVP (22 with gonorrheal proctitis, 30 with a non-LGV chlamydial proctitis and 41 with proctitis of unknown etiology). Factors associated with LGVP were analyzed by (multinomial) logistic regression.

RESULTS: Comparing men with LGVP with men without LGVP, factors significantly associated with higher risk of LGVP in multivariate analyses were: anal enema use (OR: 7.8, 95% CI: 2.6-23.2), having sex on sex parties (OR: 5.7, 95% CI: 1.5-21.8) and having sex with HIV-positive partners (OR: 3.2, 95% CI: 1.1-9.3). Evaluating the four proctitis groups separately in a multinomial logistic regression model, similar associations between anal enema use and LGVP were found. Men with non-LGV chlamydial proctitis showed less risk behavior then men with LGVP. No substantial difference in risk behavior was found, except for attending sex parties, between men with LGVP, and gonorrheal proctitis or proctitis of unknown etiology.

CONCLUSIONS: Apart from men with LGVP, men with gonorrheal proctitis or proctitis of unknown etiology exhibit high-risk behavior. Enema use seems to play a key role in transmission of LGVP, and needs further investigation.

keywords: Cross-sectional Study, Male Homosexuality, Lymphogranuloma Venereum, Proctitis, Anal enema

INTRODUCTION

Lymphogranuloma venereum (LGV) is a sexually transmitted infection (STI) originally confined to equatorial areas.[1] In 2004, a cluster of LGV cases was reported in Rotterdam.[2-4] All were men who had sex with men (MSM) and most HIV seropositive. Other industrialized countries in Europe, North America and Australia also reported LGV cases in MSM recently.[3;5]

LGV is caused by *Chlamydia trachomatis* (CT) L serovars (comprising L1, L2, L2' and L3). They elicit an invasive infection affecting submucosal connective tissue layers and lymphatic dissemination to loco-regional lymph nodes.[6] In contrast, *Chlamydia trachomatis* serovars D-K are responsible for urogenital and anorectal chlamydia infections confined to the mucosal layer, with mild to asymptomatic clinical presentations.

All LGV cases in Amsterdam are caused by an unique chlamydia strain identified as L2b[7], and have been detected retrospectively in anal swabs from STI clinic visitors in Amsterdam as early as 2000 (no samples were available from before that year). Surprisingly, the same L2b strain was detected in anal swabs collected at a San Francisco STI clinic back to at least 1981.[7;8] These findings suggest a re-emerging infection that went unnoticed for at least 20 years, rather than a new outbreak of LGV. Although routine STI screening included CT testing in this period, LGV diagnostics (serovar typing or *Chlamydia trachomatis* serology) were no standard procedure.

We previously showed in a retrospective study that HIV status, anoscopy, and the abundant presence of white blood cells in Gram stained anorectal smears help to predict LGV infections, and can inform the clinical decision to start syndromic treatment in MSM reporting receptive anal intercourse before definite PCR results are available.[9] Here we describe results of a cross-sectional study started shortly after the recent outbreak of LGV in 2004. We investigated the relationships between potential risk factors and LGV among MSM.

METHODS

Study setting and participants

The STI outpatient clinic of the Health Service Amsterdam is the largest inner city institute for diagnosing and treating STI in the Netherlands. It offers screening and free-of-charge treatment to approximately 24,000 clients a year, many of whom are self-referred.[10] All MSM visitors reporting receptive anal intercourse in the previous six months undergo anoscopy on routine basis , and for all anorectal swabs for Gram-staining, CT and gonorrhea testing are obtained. If an anorectal swab is positive for CT, our real time PCR to exclude

LGV is performed.[11] We exclude syphilis, genital herpes and LGV, in case of inguinal bubo's, genital or peri-anal ulceration, with dark-field microscopy, syphilis serology and specific PCR tests for *T. pallidum,* herpes simplex viruses 1 and -2 and *C. trachomatis*.

This study was approved by the Ethical Committee of the Academic Medical Center, Amsterdam, The Netherlands. In the period August 2004 to August 2006, from consenting MSM reporting receptive anal contact within the previous 6 months, we included those with at least one of the 4 most prevalent proctitis diagnoses among MSM in our clinic. These are respectively; proctitis of unknown etiology, non-LGV chlamydial proctitis, gonorrheal proctitis and LGV proctitis (LGVP).[12] MSM with less prevalent diagnoses like herpetic- and syphilitic proctitis were not included in the study. A non-LGV chlamydial proctitis, gonorrheal proctitis, or LGVP diagnosis was based on definite cultivation and/or PCR results in anorectal swabs. A diagnosis of a proctitis of unknown etiology was based on the following criteria: 1) signs of hypervascularity, edema, discharge, ulcerations, fistulas, abscesses upon anoscopy and/or more than 10 white blood cells per high power field in a Gram stained anorectal smear upon first visit, and 2) exclusion of STI organisms (i.e. *N. gonnorhoeae* by cultivation and *C. trachomatis, T. pallidum*, herpes simplex 1 and 2 by PCR) after one week.

As part of the standard STI screening, client characteristics (e.g. complaints, sexual behavior, and previous STI diagnoses), physical findings, lab results, current diagnoses, and therapy were recorded in an electronic patient database. Besides the STI diagnostics collected as part of the standard procedure and described earlier[9], participants were tested, as part of the present study, for CT serology (*Chlamydia trachomatis*-IgG-pELISA, medac Diagnostika, Germany), hepatitis B serology (antibody to hepatitis B virus core antigen recombinant, Axsym system, Abbott, Germany) and hepatitis C serology (HCV version 3.0, Axsym system, Abbott, Germany, confirmed with Deciscan HCV plus, Bio-rad, Hercules, CA, USA). For HIV-seropositive participants on their consent, we obtained the CD4 count, CD8 count, and viral load measurement taken most closely both before and after the date of study inclusion, and the start date of anti-retroviral therapy (ART) from the national HIV Monitoring Foundation. Also at study inclusion, a public health nurse according to a specifically designed questionnaire interviewed participants about sexual risk behavior within the previous 6 months. Information was collected on traceable partners (partners that can be contacted by telephone, email and/or home address) and anonymous partners (non-traceable partners).

Statistical analysis

In case of anal co-infections leading to more than one proctitis diagnosis, men were allocated to a proctitis group according to the following hierarchy, which was based on the

diagnostic frequency among our MSM clinic attendees during one year: LGVP, gonorrheal proctitis, non-LGV chlamydial proctitis, and proctitis of unknown etiology. This was done because we expected the most network associated factors in the least prevalent proctitis group. Therefore, men with an LGVP (least prevalent among MSM clinic attendees) and gonorrheal proctitis were included in the LGVP group, whereas men with gonorrheal proctitis and non-LGV chlamydial proctitis (being more prevalent than gonorrheal proctitis among MSM clinic attendees) were included in the gonorrheal proctitis group.

Differences in background characteristics, clinical signs, markers of HIV disease progression if diagnosed HIV-positive, and sexual risk behaviors across men with LGVP, gonorrheal proctitis, non-chlamydial proctitis or proctitis of unknown etiology were tested univariately using ANOVA or Kruskal-Wallis test (continuous variables) or Pearson chi square test for independence, with Fishers' exact test in case of small numbers (non-continuous variables).

To assess sexual risk behaviors associated with LGV among MSM with proctitis, we first performed univariate and multivariate logistic regression analysis using STATA version 9. MSM with LGVP were compared with MSM with a non-LGV proctitis. Variables related to sexual partners (number, type and HIV status), and practices such as unprotected receptive anal intercourse, fisting, use of toys, use of anal enemas, anal use of elicit drugs, and location of sexual contact (dark room, park, party, home, abroad) were first evaluated univariately. Subsequently, all variables were entered in a multivariate logistic regression model. Backward selection was performed using the likelihood ratio test. To assess the robustness of our model we also performed similar analyses restricted to MSM with signs of a proctitis based on anoscopy or more than 10 WBC in the anal gram-stain, irrespective of a causative STI organism. Secondly, variables included in the multivariate model were tested using multinomial logistic regression containing the 4 proctitis groups separately and using the proctitis of unknown etiology group as the reference group. A p value <0.05 was considered statistically significant.

RESULTS

We included 125 participants between August 2004 and August 2005with over-sampling of LGV cases for whom the inclusion period was extended until April 2006; 32 (26%) had LGVP (7 were co-infected with anal gonorrhea), 22 (18%) had gonorrheal proctitis (6 were co-infected with anal non-LGV chlamydia), 30 (24%) had non-LGV chlamydial proctitis and 41 (48%) had proctitis of unknown etiology. We excluded five men with an anal

swab positive for chlamydia due to inconclusive serovar determination by PCR; and we excluded 1 participant with syphilitic proctitis and 7 with herpetic proctitis.

Background and clinical characteristics

Overall, participants with LGVP and proctitis of unknown etiology were older than men with gonorrheal or non-LGV chlamydial proctitis (table 1). The majority of the men with LGVP were HIV-positive (78%), compared to 54% of the men with proctitis of unknown etiology, 50% of the men with gonorrheal proctitis and 27% of the men with non-LGV chlamydial proctitis. Men with LGVP or proctitis of unknown etiology were more often positive for hepatitis B virus core antibody (65% and 59%, respectively) than men with non-LGV chlamydial (30%) or gonorrheal proctitis (23%). Both previous and concurrent syphilis and HCV infections, although the latter two effects were not statistically significant, were found more often in men with LGVP than in men with proctitis of unknown etiology, gonorrheal proctitis or non-LGV chlamydial proctitis.

The majority of the men with LGVP, gonorrheal proctitis or proctitis of unknown etiology reported STI-related symptoms as reason for visiting the clinic compared to the minority of the men with non-LGV chlamydial proctitis. Anal discharge was reported by 44% of the men with LGVP and 32% of the men with gonorrheal proctitis, whereas only 1 man with non-LGV chlamydial proctitis reported anal discharge. Remarkably , a substantial number of men with LGVP, showed no anoscopic abnormalities (40%) and reported no anal discharge (56%).

MSM with LGVP and gonorrheal proctitis had higher numbers of white blood cells in the anal gram stain compared to men with proctitis of unknown etiology or non-LGV chlamydial proctitis. The majority (60%) of the MSM with LGVP and 20% of the MSM with proctitis of unknown etiology had a *Chlamydia trachomatis* IgG titer of 800 or higher.

Of the 66 men with HIV positive serology, 38 men (18 with LGVP, 6 with gonorrheal, 4 with chlamydial and 10 with proctitis of unknown etiology) consented to retrieval of HIV data from the HIV Monitoring Foundation. The men with LGVP did not differ from MSM without LGV proctitis in ART duration or (changes in) CD4 count, CD8 count and HIV viral load as measured around the time of inclusion (data not shown).

Sexual risk factors associated with LGVP

Of our 125 participants, 101 (81%) consented to fill in the questionnaire on sexual partners and sexual risk behavior (all 32 men with LGVP and 69/93 men, i.e. 74%, without

LGVP). Men who declined did not differ significantly from the others with respect to age, ethnicity, HIV status, or previous STI's diagnosed.

First, we compared MSM with LGVP to those without LGVP using logistic regression analysis (table 2). Unprotected receptive anal intercourse, use of enemas, anal drug use, sex in darkrooms, having sex on sex parties and having sex with HIV-positive partners were associated with LVGP in univariate analysis. In multivariate logistic regression, LGVP remained significantly associated with use of enemas (Odds Ratio (OR) 7.8, 95% confidence interval (CI) 2.6-23.2), having sex on sex parties (OR: 5.7, 95% CI: 1.5-21.8) and having sex with HIV positive partners (OR 3.2, 95% CI 1.1-9.3). Surprisingly, using toys was associated with a lower LGVP risk (OR: 0.2, 95% CI 0.04-0.6). To asses the robustness of our model we repeated our analysis restricted to MSM with proctitis based on anoscopic abnormalities or more than 10 WBC in the anal gram stain, irrespective of an STI causing organism. This analysis revealed a multivariate model containing the same four variables as described above. The effects were comparable except that the odds ratio for the use of enemas increased to 12.0 (95% CI 3.1-46.9).

We then compared the 4 proctitis groups separately (table 3). A large part of the MSM with LGVP, gonorrheal proctitis or proctitis of unknown etiology reported sexual contact with anonymous partners, whereas most of the men with non-LGV chlamydial proctitis reported sexual contact only with traceable partners. For the men reporting anonymous partners, the total number of anonymous partners did not differ significantly between the four groups, but seemed lower among MSM with non-LGV-chlamydial proctitis (table 3, p=0.22) Moreover, MSM with non-LGV chlamydial proctitis had significantly less sex in darkrooms (28%), and more often had sex with known HIV negative partners (59%) than MSM with LGVP, gonorrheal proctitis, or proctitis of unknown etiology. Most of the MSM with LGVP reported anal enema use (69%), which was significantly more often than in MSM with gonorrheal proctitis or proctitis of unknown etiology (25% and 13%, respectively). Also 41% of the MSM with non-LGV chlamydial proctitis reported anal enema use.

Finally, we evaluated our 4 proctitis groups separately in a multinomial logistic regression model (table 4). Similar associations with LGV as reported above were found. When comparing with the proctitis of unknown etiology group, anal enema use was associated with a higher LGVP risk (OR 31.1, 95%CI 5.4-180.3), a higher non-LGV chlamydial proctitis risk (OR 8.7, 95%CI 1.6-46.7), and with a higher gonorrheal proctitis risk (OR 3.1, 95%CI 0.5-20.4). Toy use was associated with a lower risk for LGVP, whereas having sex on a party was associated with a higher LGVP risk.

DISCUSSION

Since the identification of numerous outbreaks of LGV among MSM in the industrialized world, those affected are limited to a network of men with high-risk behavior for STI's.[14] Among men with LGVP we found multiple previous STI's, and high HIV prevalence, reflecting high-risk behavior in this group. Additionally, apart from having sex with HIV-positive partners and having sex on a sex party, enema use was strongly associated with LGVP in our MSM population.

So, high-risk behavior seems to be an important factor in LGVP transmission. In addition, MSM with proctitis of unknown etiology or gonorrheal proctitis did not seem to substantially differ in there sexual risk behavior from MSM with LGVP given their high prevalence of HIV-and HBV antibodies, and high levels of a previous syphilis infection, having sex with anonymous partners and sex in dark rooms. However, MSM with LGVP more often reported sex on sex party. This suggests that MSM with these three forms of proctitis are taking part in high-risk sexual networks for STI. In contrast, MSM with non-LGV chlamydial proctitis seem to take part in networks with a lower risk for STI (table 3).

Our study suggest that enema use is the most important factor associated with LGVP, although residual confounding factors can never be excluded and the limited number of cases in this study possibly caused relevant factors to go unnoticed. On the other hand, the association between enema use and LGVP was consistent in the different statistical models which support its relevance in the transmission of LGVP.

Before 2004, standard STI screening in industrialized countries did not include specific LGV diagnostics. It is never the less puzzling that the LGV epidemic could spread worldwide and remain unnoticed for so long. We earlier speculated [9] that the increase could be explained by the immune restoration inflammatory syndrome (IRIS), which is characterized by paradoxical infectious and inflammatory processes in immune-compromised HIV patients soon after starting ART.[15] HIV patients with asymptomatic LGVP would thus become symptomatic the moment their immune system responded to ART, but this was not confirmed by the present study. Most HIV positive men with LGVP had been on ART for several years before LGVP was diagnosed. Moreover, no sudden signs of immune restoration (CD4 count increase, HIV viral load decrease) could be demonstrated around the time of LGVP diagnosis. Therefore, it seems unlikely that IRIS caused the sudden identification of LGV outbreaks.

Even though most men diagnosed with LGVP visited the clinic because of STI-related complaints and/or showed abnormalities upon anoscopy, 40% of the LGVP cases reported little complaints and/or had no physical abnormalities. This was in accordance with our previous findings in a retrospective case-control study.[9] Since these mild cases can delay the diagnosis and hamper screening and prevention measures, clinicians should not count on patient complaints and/or proctoscopic findings alone to identify LGVP. Serovar determination to exclude LGV is therefore advisable in MSM with a PCR-positive anorectal chlamydia infection.[11;16] In case serovar determination is unavailable, a white blood cell count in Gram stain smears from anal mucosa, HIV-testing and anoscopy can be useful in discriminating non-LGV chlamydial proctitis from LGVP.[9]

Hepatitis C antibodies were detected in 4 out of 32 men with LGVP (13%), supporting earlier reports that hepatitis C infection seems sexually transmissible among MSM, particularly in high-risk MSM networks.[17] Why the use of toys was negatively associated with LGVP is unclear but our findings are in contrast with the previously suggested role of toy use in the transmission of LGV.[3] However, all four studied forms of proctitis (gonorrhoeal proctitis, nonLGV chlamydial proctitis, proctitis of unknown etiology and LGVP) could be transmitted through the rectal exposure to rectal excretions during the sharing of toys and fisting, thus eliminating associations with these sexual practices.

MSM reporting receptive anal intercourse, often take anal enemas before having sex for hygienic reasons.[18] Anal enemas have been shown to be associated with sexual transmission of hepatitis B [19] and hepatitis C [20]. To our knowledge, we describe here for the first time their possible role as a risk factor for STI-related forms of proctitis like LGVP, but also for non-LGV chlamydial proctitis (and to a lesser extend for gonorrhoeal proctitis) given the substantial increased odds when compared to men with proctitis of unknown etiology (table 4).

When preliminary analysis revealed that that enema use was associated with LGVP, we designed and implemented an additional questionnaire focused on the practice of enema use. This questionnaire was completed by 68/125 participants of whom 22 MSM with LGVP Most men took anal enemas and all used tap water. One man added salt, another added soap to the water; both did not have LGVP. The majority irrigated using a hose connected to the water supply system, whereas a minority irrigated with water using a douche ball. About one quarter shared their enema equipment with others, but this was not significantly associated with any of the study groups (data not shown).

To identify both symptomatic as well as asymptomatic LGV cases among MSM we have developed a routine screenings method. As described in the methods section, all patients reporting receptive anal intercourse in the previous 6 months undergo anoscopy and anorectal swabs for Gram-staining CT and gonorrhea testing are obtained. In case anal chlamydia is diagnosed, additional serovar determination is performed to exclude LGVP. Moreover, chlamydia diagnostic is performed on all genital and perianal ulceration to exclude inguinal forms of LGV. Due to this routine procedure we were able to show that the LGV epidemic in 2007 is ongoing in the Netherlands. [21]

Why enema use is associated with STI transmission can be speculated upon. The additional information on enema use taught us that it is likely the irrigation procedure itself and not an aggressive substance added to the water used, since almost all men only reported the use of water when using enemas. The disruption of the mucosal barrier caused by anal irrigation before receptive anal intercourse facilitates transmission of STI pathogens, and also of blood borne viruses such as HBV and HCV.[19;20] Discouraging the use of enemas as such seems warranted. These findings stress the importance of further research on the biological effects (as we plan to do), but also behavioral effects of anal enemas on the transmission of STI's in general and LGVP, in particular.

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Table

TABLES

Table 1. Background and clinical characteristics of 32 men with an LGV proctitis (LGVP), and 93 men without LGVP comprising 22 men with gonorrheal proctitis (GOP), 30 men with a non-LGV Chlamydia proctitis (CTP), and 41 men with a proctitis of unknown etiology (PUE)[1], STI outpatient clinic Amsterdam, August 2004-April 2006.

Background characteristics	**With LGVP, n (%)**	**Without LGVP**			
		GOP, n (%)	**CTP, n (%)**	**PUE, n (%)**	**p[2]**
Mean age (standard deviation)	39.6 (8.2)	35.8 (7.6)	34.7 (7.5)	40.4 (8.0)	0.008
Sexual orientation					0.5
Sex with men only	32 (100)	21 (95)	28 (93)	40 (98)	
Sex with both men and women	0 (0)	1 (5)	2 (7)	1 (2)	
Ethnicity					0.80
West-European	25 (78)	15 (68)	23 (77)	33 (80)	
South-American, including Dutch Antilles and Surinam	3 (9)	3 (14)	4 (13)	2 (5)	
Other	4 (13)	4 (18)	3 (10)	6 (15)	
HIV antibodies					0.001
negative	5 (16)	9 (41)	21 (70)	16 (39)	
positive	25 (78)	11 (50)	8 (27)	22 (54)	
unknown	2 (6)	2 (9)	1 (3)	3 (7)	
Hepatitis C antibodies					0.38
negative	27 (87)	21 (95)	28 (93)	40 (98)	
positive	4 (13)	1 (5)	2 (7)	1 (2)	
Hepatitis B core antibodies					0.002
negative	11 (35)	17 (77)	21 (70)	17 (41)	
positive	20 (65)	5 (23)	9 (30)	24 (59)	
Concurrent syphilis infection[3]	6 (19)	2 (9)	1 (3)	4 (10)	0.28
Previous chlamydia infection	14 (44)	9 (41)	13 (43)	23 (56)	0.58
Previous gonorrhea infection	17 (53)	14 (64)	15 (50)	20 (49)	0.71
Previous syphilis infection	19 (60)	8 (36)	5 (17)	12 (29)	0.004
STI related complaint[4]	27 (84)	16 (73)	13 (43)	35 (83)	<0.001
Anal discharge (patient complaint)	14 (44)	7 (32)	1 (3)	8 (20)	0.001

[1] PUE diagnosis based on inflammatory signs and/or more than 10 white blood cells/high power field in the gram-stain
[2] Tested with ANOVA (continuous variables) or Pearson chi square test for independence with Fishers' exact test in case of small numbers (non-continuous variables).
[3] Infectious stages: syphilis first and second stage and latent recent syphilis
[4] Reason for STI clinic visit.

Clinical signs					
Enlarged inguinal lymph nodes	4 (13)	4 (18)	5 (17)	6 (15)	0.93
Abnormalities at routine anoscopic examination	19 (60)	11 (50)	8 (27)	34 (83)	<0.001
WBC[5] count in Gram-stained anorectal smear specimen					<0.001
≤10 cells/hpf	9 (30)	2 (10)	16 (70)	14 (36)	
11-50 cells/hpf	5 (17)	1 (5)	5 (22)	14 (36)	
>50 cells/hpf	16 (53)	17 (85)	2 (9)	11 (28)	
Chlamydia trachomatis IgG titer					<0.001
<=200	8 (25)	14 (64)	24 (86)	28 (70)	
>200 and <800	5 (16)	6 (27)	3 (11)	4 (10)	
>=800	19 (60)	2 (9)	1 (4)	8 (20)	

[5] WBC, white blood cells; hpf, high-power field.

Table 2. Logistic regression analysis of sexual risk behaviors of 32/32 men with LGV proctitis (LGVP) compared to 69/93 men without LGVP, STI outpatient clinic Amsterdam, August 2004-April 2006.

Sexual risk behaviors	**OR (95% CI) Univeriate logistic regression**	**P**	**OR (95% CI) Multivariate logistic regression containing only significant variables**	**p**
Number of anonymous partners		0.44		
0	1			
1-5	1.1 (0.3-4.0)			
5-15	0.9 (0.2-3.2)			
>15	2.0 (0.6-6.6)			
Unprotected receptive anal intercourse		0.02		
No	1.7 (0.2-18.4)			
Only with traceable partners	1			
Only with anonymous partners	4 (0.9-18.8)			
With traceable and anonymous partners	5 (1.8-13.9)			
Fisting	1.8 (0.7-4.5)	0.19		
Use of toys	0.9 (0.4-2.1)	0.73	0.2 (0.04-0.6)	0.009
Use of enema	5.8 (2.3-14.4)	<0.001	7.8 (2.6-23.2)	<0.001
Anal drug use	3.8 (1.0-14.4)	0.05		
Sex in a darkroom	3.1 (1.2-7.2)	0.02		
Sex on a sex party	3.1 (1.1-8.3)	0.03	5.7 (1.5-21.8)	0.01
Sex in a foreign country	1.7 (0.7-3.9)	0.24		
Sex with HIV positive partners	2.9 (1.2-6.9)	0.02	3.2 (1.1-9.3)	0.03
Sex with HIV negative partners	0.41 (0.2-1.0)	0.06		

Table 3. Sexual risk behaviors with traceable (TP) and anonymous partners (AP) of 32 men with LGV proctitis (LGVP), 16 men with gonorrheal proctitis (GOP), 29 men with a non-LGV chlamydia proctitis (non-LGV chlamydial proctitis), and 24 men with a proctitis of unknown etiology (PUE)[6], STI outpatient clinic Amsterdam, August 2004-April 2006.

Sexual risk behaviors	**With LGVP n (%)**	**Without LGVP**			
		GOP n (%)	**CTP n (%)**	**PUE N (%)**	**P[2]**
Unprotected receptive anal intercourse					0.001
No	1 (3)	0 (0)	2 (7)	1 (4)	
Only with traceable partners	7 (22)	5 (31)	20 (69)	10 (42)	
Only with anonymous partners	4 (13)	2 (13)	2 (7)	1 (4)	
With traceable and anonymous partners	20 (63)	8 (50)	3 (10)	9 (38)	
Unknown	0 (0)	1 (6)	2 (7)	3 (13)	
Fisting	12 (38)	3 (19)	7 (24)	7 (29)	0.52
Use of toys	10 (31)	6 (38)	9 (31)	9 (38)	0.93
Use of enema	22 (69)	4 (25)	12 (41)	3 (13)	<0.001
Anal drug use	6 (19)	0 (0)	1 (3)	3 (13)	0.11
Sex in a darkroom	24 (75)	11 (69)	8 (28)	15 (63)	0.001
Sex on a sex party	11 (34)	2 (13)	4 (14)	4 (17)	0.15
Sex in a foreign country	15 (47)	6 (38)	8 (28)	10 (42)	0.47
Sex with HIV positive partners	19 (59)	7 (44)	8 (28)	8 (33)	0.065
Sex with HIV negative partners	8 (25)	4 (25)	17 (59)	10 (42)	0.033
Number of anonymous partners (median, IQR)[7]	16 (6-29)	14 (6-21)	8 (2-15)	14 (6-30)	0.22

[6] PUE diagosis based on clinical signs of a proctitis and/or more than 10 white blood cells/high power field and in the gram-stain.
[7] Only for men reporting anonymous partners, IQR Inter quartile ratio

Table 4. Multivariate multinomial logistic regression model of 32 men with LGV proctitis (LGVP),16 men with gonorrheal proctitis (GOP), 29 men with a non-LGV chlamydia proctitis (non-LGV chlamydial proctitis), compared with 24 men with a proctitis of unknown etiology (PUE), reference group)[8] STI outpatient clinic Amsterdam, August 2004-April 2006.

Group	Risk factor	Odds Ratio (95% CI)	p
CTP	Use of toys	0.3 (0.1-1.5)	0.1
	Use of enemas	8.7 (1.6-46.7)	0.01
	Sex on a sex party	1.6 (0.3-9.8)	0.6
	Sex with HIV positive partners	0.7 (0.2-2.5)	0.5
GOP	Use of toys	0.4 (0.08-2.5)	0.4
	Use of enemas	3.1 (0.5-20.4)	0.2
	Sex on a sex party	1.0 (0.1-8.2)	1.0
	Sex with HIV positive partners	1.3 (0.3-5.4)	0.7
LGVP	Use of toys	0.07 (0.01-0.4)	0.004
	Use of enemas	31.1 (5.4-180.3)	0.000
	Sex on a sex party	7.6 (1.2-47.1)	0.03
	Sex with HIV positive partners	2.8 (0.7-11.3)	0.1

[8] PUE diagosis based on clinical signs of a proctitis and/or more than 10 white blood cells/high power field and in the gram-stain.