ORIGINAL ARTICLE

Correlation between pubic hair grooming and STIs: results from a nationally representative probability sample

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ABSTRACT

Objective STIs are the most common infections among adults. Concurrently, pubic hair grooming is prevalent. Small-scale studies have demonstrated a relationship between pubic hair grooming and STIs. We aim to examine this relationship in a large sample of men and women.

Design We conducted a probability survey of US residents aged 18–65 years. The survey ascertained self-reported pubic hair grooming practices, sexual behaviours and STI history. We defined extreme grooming as removal of all pubic hair more than 11 times per year and high-frequency grooming as daily/weekly trimming. Cutaneous STIs included herpes, human papillomavirus, syphilis and molluscum. Secretory STIs included gonorrhoea, chlamydia and HIV. We analysed lice separately.

Results Of 7580 respondents who completed the survey, 74% reported grooming their pubic hair, 66% of men and 84% of women. After adjusting for age and lifetime sexual partners, ever having groomed was positively associated with a history of self-reported STIs (OR 1.8; 95% CI 1.4 to 2.2), including cutaneous STIs (OR 2.6; CI 1.8 to 3.7), secretory STIs (OR 1.7; CI 1.3 to 2.2) and lice (OR 1.9; CI 1.3 to 2.9). These positive associations were stronger for extreme groomers (OR 4.4; CI 2.9 to 6.8) and high-frequency groomers (OR 3.5; CI 2.3 to 5.4) with cutaneous STIs, and for non-extreme groomers (OR 2.0; CI 1.3 to 3.0) and low-frequency groomers (OR 2.0; CI 1.3 to 3.1) with lice.

Conclusions Among a representative sample of US residents, pubic hair grooming was positively related to self-reported STI history. Further research is warranted to gain insight into STI risk-reduction strategies.

INTRODUCTION

Pubic hair removal has become a common practice among men and women worldwide.[1] The media has driven adoption of new grooming patterns[2][3] and modern society's definition of attractiveness, cleanliness and feelings of femininity or masculinity. As a result, our perception of genital normalcy has changed.[1][3][4]

While hair removal has been shown to contribute to increased morbidity, such as injury[5] and cutaneous infections (eg, folliculitis[2]), little is known about the relation between grooming practices and STIs. Such a relation is plausible because the act of grooming with razors or shavers causes epidermal microtears, which may permit epithelial penetrance by bacterial or viral STIs, such as human papillomavirus (HPV) and molluscum contagiosum.[6] This hypothesis is supported by a small-scale report of increased molluscum contagiosum acquisition among groomers.[7] On the other hand, grooming removes the amount and length of pubic hair, which may reduce the risk of acquiring other sexually transmitted pathogens, such as pubic lice. This hypothesis is also supported by a small-scale report.[8] Finally, as pubic hair grooming is correlated with an increased number of lifetime sexual partners and is viewed as a preparatory act to sexual engagement,[1][4][9][10] it may also serve as a marker of increased STI risk. Irrespective of the underlying mechanism—whether a causal relation or statistical association—understanding the possible link between pubic hair grooming and STI acquisition could be useful for developing strategies to reduce STI rates.

STIs remain the most commonly transmitted infection, and the USA has the highest incidence of STIs among the industrialised countries.[11] Roughly half of Americans will acquire an STI at some point in their lifetime.[12] STIs are associated with a multitude of sequelae, including pelvic inflammatory disease, infertility, genital-related cancers and increased rates of HIV acquisition and transmission.[11] The increasing incidence of STIs warrants investigation into reduction strategies beyond routine screening, media advertisements and improved diagnostics.[2] Prior studies have demonstrated that the act of grooming with a razor causes epidermal microtears, which may permit epithelial penetrance by bacterial or viral STIs, such as HPV and molluscum contagiosum.[6][7] A better understanding of the relation between pubic hair grooming and STI risk could lead to improved STI-reduction strategies by identifying high-risk individuals who would benefit from education regarding safe sex practices. Our group has previously reported that grooming in conjunction with sexual orientation and sexual role may influence STI transmission;[13] however, no large-scale, gender-balanced study has evaluated the relation between grooming and STIs, taking into consideration specific grooming practices. Our hypothesis is that grooming is positively related to STIs, except for pubic lice that would be reduced by hair removal.

METHODS
Study population
We conducted a nationally representative survey of non-institutionalised adults aged 18–65 years

residing in the USA. We developed a questionnaire designed to capture and characterise pubic hair grooming practices, grooming injuries, sexual behaviours and STI history (see online supplementary appendix A). The survey was conducted with the GfK group (GfK, formerly Knowledge Networks). Details regarding GfK study methods have previously been reported and are briefly summarised below.[14]

Study participants are recruited using random probability-based sampling to increase accuracy.[15] Respondents are recruited using address-based sampling of the US Postal Service's delivery sequence file. The address-based sampling estimates 97% of households can be reached and contacted through household mail.[14] Once a survey participant is recruited, he/she receives a notification via email to participate in a study sample. The participants may also check their personal online member page to participate in survey taking. The topic of the survey is given to the participants. The participants do not see any questions from a particular survey until they accept the survey. The topic of the current study was 'Personal Grooming Injuries'. GfK provides a laptop computer and free internet service to all panel members without access to the internet. For the current study, the panel members received 1000 points for completing the survey, which is the cash equivalent of $1.

A pretest survey was completed in December 2013 to ensure face validity and participant comprehension. The final survey was conducted in January 2014. GfK consented all participants prior to the survey.

GfK uses statistical weighting adjustments to correct for known deviations. Additional survey errors such as non-coverage and non-response are also corrected using panel demographic poststratification weights.[14] The Committee on Human Research approved this study at the University of California—San Francisco, San Francisco, California, USA (#13-11519).

Main exposure variables

Our survey instrument queried participants' grooming practices, including whether they had ever groomed (yes/no) and their frequency of grooming (daily, weekly, monthly, every 3–6 months or every year). It also queried the amount of hair respondents typically removed (trimming vs complete removal), and typical grooming tools (non-electric razor, electric razor, wax, scissors, electrolysis, laser hair removal, depilatories or tweezers). We defined ever groomers as anyone who had groomed their pubic hair in the past, extreme groomers as those who removed all of their pubic hair via grooming more than 11 times per year and high-frequency groomers as those who performed daily or weekly pubic hair trimming. Extreme groomers and high-frequency groomers were not mutually exclusive categorisations as respondents may remove all of their pubic hair (extreme) more than 11 times per year and also trim their pubic hair on a weekly basis following hair regrowth.

Main outcome variables

The participants were queried on their history of STIs, including the number and type of STIs. We categorised cutaneous STIs as herpes, HPV, syphilis and molluscum contagiosum, and secretory STIs as gonorrhoea, chlamydia and HIV. We analysed pubic lice separately. The participants with missing or incomplete data were excluded from the analyses (n=110, 1.5%).

Covariates

We included demographic factors such as age and sex, and sexual behaviour variables such as frequency of sexual activity and number of sexual partners annually and over a lifetime.

Statistical methods

We limited the analytic sample to participants who reported at least one lifetime sexual partner to ensure that all participants were at risk for STIs. Univariable associations between grooming and STI history were investigated by comparing the prevalence of each individual STI and STI type by grooming status and practices, using χ^2 or Fisher's exact test, as appropriate. Multivariable logistic regression models were then created to measure associations adjusting for confounders a priori (age and number of lifetime sexual partners). A data analysis was performed with Stata V.13.0 (StataCorp, College Station, Texas, USA). p Values ≤0.05 were considered statistically significant.

RESULTS

Grooming habits

In total, 7580 subjects completed the survey out of 14 409 sampled (52.5%). Respondent breakdown by sex was 56% men and 44% women. Of the 7580, a total of 7470 respondents reported at least one lifetime sexual partner.

The majority of participants (74%) reported a history of grooming their pubic hair (66% men and 84% women). Of those who groomed, 17% were extreme groomers and 22% were high-frequency groomers; 10% of extreme groomers were also high-frequency groomers (table 1). Overall, groomers were younger than non-groomers (mean age and SD 43±13 years vs 50±13 years, respectively). Groomers reported a greater number of annual (mean, SD 1.9±21.7) and total lifetime sexual partners (mean, SD 16.5±60.1) compared with non-groomers (mean, SD 1.2±2.1 and 13.8±52.3, respectively). Groomers also reported more frequent weekly and daily sexual activity (53% and 4%, respectively) compared with non-groomers (43% and 3%, respectively). Considering only participants who groomed, those who were extreme or high-frequency groomers were more likely to be younger and female, and to report more frequent sexual activity than those who were non-extreme or low-frequency groomers. Extreme groomers also reported a greater number of annual and total lifetime sexual partners than other types of groomers (table 1).

Grooming tools

The types of grooming tool used varied by sex. A greater percentage of male groomers used an electric razor compared with female groomers (42% vs 12%). Non-electric razor usage was more common among women compared with men (61% vs 34%). Scissor usage was equally prevalent among both male and female groomers (19% vs 18%, respectively). Women reported using wax more often than men (5% vs 0%, respectively). Electrolysis, laser hair removal and usage of tweezers were rare among both male and female groomers.

Grooming and STIs

Thirteen per cent of participants (n=943) reported a history of STI(s), 11% men and 15% women (table 2). A greater proportion of groomers reported a lifetime history of STIs than non-groomers (14% vs 8%, respectively, p<0.01). Among groomers only, those who reported extreme grooming were more likely to report a lifetime history of STIs than those who reported non-extreme grooming (18% vs 14%, respectively, p<0.01), whereas no differences were observed between high-frequency and low-frequency groomers (15% vs 14%, respectively, p=0.92) (table 2).

Table 1 Demographic and sexual behavioural characteristics of participants by grooming subtypes in a nationally representative US probability sample, 2013

		Non-groomers n=1953	Groomers n=5517	Extreme groomers n=922	High-frequency groomers n=1196
Age (years) (mean (SD))		49.8 (13.0)	43.3 (13.0)	37.4 (12.2)	38.8 (12.3)
Sex (%)	Male	1415 (73)	2739 (50)	347 (38)	404 (34)
	Female	538 (28)	2778 (50)	575 (62)	792 (66.2)
Annual number of sexual partners (mean (SD))	Per year	1.23 (2.1)	1.92 (21.7)	3.24 (36.7)	1.90 (9.9)
	Lifetime	13.8 (52.3)	16.5 (60.1)	22.1 (75.6)	16.9 (49.4)
Frequency of sexual activity (%)	Less than monthly	298 (23)	738 (17)	103 (13)	120 (12)
	Monthly	422 (32)	1169 (27)	168 (21)	217 (21)
	Weekly	560 (43)	2325 (53)	478 (59)	632 (61)
	Daily	38[16]	175 (4)	58 (7)	71 (7)

Extreme grooming—removal of all pubic hair more than 11 times per year.
High-frequency grooming—hair trimming daily or weekly.

Table 2 Associations of grooming practices with self-reported histories of individual STIs and individual types of STIs in a nationally representative US probability sample, 2013

	Non-groomers, n (%) 1953	Groomers, n (%) 5517	p Value*	Non-extreme groomers, n (%) 4558	Extreme groomers, n (%) 922	p Value*†	Low-frequency groomers, n (%) 4292	High-frequency groomers, n (%) 1196	p Value*‡
History of any STI	159 (8)	784 (14)	<0.01	618 (14)	163 (18)	<0.01	611 (14)	172 (15)	0.92
History of cutaneous STIs:									
Any cutaneous STI§	46 (2)	356 (7)	<0.01	265 (6)	88 (10)	<0.01	261 (6)	95 (8)	0.02
Herpes	20 (1)	142 (3)	<0.01	105 (2)	36 (4)	0.01	107 (3)	35 (3)	0.40
HPV¶	14 (1)	182 (3)	<0.01	126 (3)	55 (6)	<0.01	127 (3)	55 (5)	0.01
Syphilis	14 (0.7)	69 (1.3)	0.05	59 (1)	10 (1)	0.60	56 (1)	13 (1)	0.55
Molluscum contagiosum	2 (0.1)	6 (0.1)	0.94	5 (0.1)	0 (0)	0.31	4 (0.1)	2 (0.2)	0.49
History of secretory STIs:									
Any secretory STI§	97 (5)	441 (8)	<0.01	353 (8)	88 (10)	0.07	356 (8)	84 (7)	0.15
Gonorrhoea	62 (3)	215 (4)	0.15	189 (4)	26 (3)	0.06	188 (4)	27 (2)	<0.01
Chlamydia	46 (2)	286 (5)	<0.01	214 (5)	72 (8)	<0.01	221 (5)	64 (5)	0.78
HIV	3 (0.2)	28 (0.5)	0.04	25 (1)	3 (0.3)	0.39	22 (1)	6 (0.5)	0.96
History of other STIs:									
Lice	34 (2)	162 (3)	0.01	143 (3)	19 (2)	0.08	142 (3)	20 (2)	<0.01

Extreme grooming—removal of all pubic hair more than 11 times per year. High-frequency grooming—hair trimming daily or weekly.
*Calculated by χ^2 or Fisher's exact test.
†Compares extreme with non-extreme groomers.
‡Compares high-frequency groomers with low-frequency groomers.
§Any of the subcategorised independent STIs.
¶ HPV includes HPV, vaginal and anal warts.
HPV, human papillomavirus.

Grooming and cutaneous STIs

Groomers were more likely to report a history of cutaneous STIs when compared with non-groomers (7% vs 2%, respectively, p<0.01). This positive association was observed for herpes (3% vs 1%, respectively, p<0.01), HPV (3% vs 1%, respectively, p<0.01) and syphilis (1.3% vs 0.7%, respectively, p=0.05), but not for molluscum contagiosum, although the number of participants who reported molluscum was low (table 2). Stronger positive associations were observed for extreme groomers when compared with non-extreme groomers with a history of cutaneous STIs and for individuals with histories of herpes and HPV (table 2). The stronger positive associations were also observed for high-frequency groomers compared with low-frequency groomers with histories of cutaneous STIs and for individuals with histories of HPV (table 2).

Grooming and secretory STIs

Groomers were more likely to report a history of secretory STIs compared with non-groomers. This positive association was observed for chlamydia and HIV, but was not statistically significant for gonorrhoea. Extreme groomers compared with non-extreme groomers were more likely to report a history of secretory STIs, although this did not reach statistical significance. Extreme groomers were significantly more likely to report a history of chlamydia than non-extreme groomers. Finally, high-frequency groomers were significantly less likely to report a history of gonorrhoea than low-frequency groomers.

For pubic lice, groomers were more likely to report a history of this STI than non-groomers, but this association was limited to non-extreme and low-frequency groomers.

Table 3 Adjusted associations of grooming practices with self-reported histories of individual types of STIs in a nationally representative US probability sample, 2013

Non-groomers	Any STI N=943		Cutaneous STI N=401		Secretory STI N=538		Lice N=196	
	Crude OR 1.0 (reference‡)	Adjusted OR† 1.0 (reference‡)	Crude OR 1.0 (reference‡)	Adjusted OR† 1.0 (reference‡)	Crude OR 1.0 (reference‡)	Adjusted OR† 1.0 (reference‡)	Crude OR 1.0 (reference‡)	Adjusted OR† 1.0 (reference‡)
Groomers	1.9 (1.6–2.2)**	1.8 (1.4–2.2)**	2.9 (2.1–3.9)**	2.6 (1.8–3.7)**	1.7 (1.3–2.1)**	1.7 (1.3–2.2)**	1.7 (1.2–2.5)**	1.9 (1.3–2.9)**
Non-extreme groomers	1.8 (1.5–2.1)**	1.7 (1.4–2.1)**	2.6 (1.9–3.5)**	2.3 (1.6–3.3)**	1.6 (1.3–2.0)**	1.6 (1.2–2.1)**	1.8 (1.3–2.7)**	2.0 (1.3–3.0)**
Extreme groomers	2.4 (1.9–3.0)**	2.5 (1.9–3.3)**	4.4 (3.0–6.3)**	4.4 (2.9–6.8)**	2.0 (1.5–2.7)**	2.2 (1.6–3.2)**	1.2 (0.7–2.1)	1.5 (0.8–3.0)
Low-frequency groomers	1.9 (1.6–2.2)**	1.7 (1.4–2.2)**	2.7 (2.0–3.7)**	2.4 (1.6–3.4)**	1.7 (1.4–2.2)**	1.7 (1.3–2.3)**	1.9 (1.3–2.8)**	2.0 (1.3–3.1)**
High-frequency groomers	1.9 (1.5–2.4)**	2.0 (1.5–2.6)**	3.6 (2.5–5.1)**	3.6 (2.3–5.4)**	1.5 (1.1–2.0)*	1.6 (1.1–2.2)*	1.0 (0.6–1.7)	1.4 (0.8–2.6)

Extreme grooming—removal of all pubic hair more than 11 times per year. High-frequency grooming—hair trimming daily or weekly. Cutaneous STI—herpes, HPV, syphilis, vaginal/anal warts and molluscum contagiosum. Secretory STI—gonorrhoea, chlamydia and/or HIV.
*p<0.05, **p<0.01.
†Adjusted for age and number of lifetime sexual partners.
‡Reference category for all comparisons.
HPV, human papillomavirus.

Multivariate analysis

After adjustment for age and number of lifetime sexual partners, ever having groomed remained positively associated with histories of any STIs (OR 1.8; 95% CI 1.4 to 2.2), cutaneous STIs (OR 2.6; CI 1.8 to 3.7), secretory STIs (OR 1.7; CI 1.3 to 2.2) and pubic lice (OR 2.0; CI 1.25 to 2.91) when compared with non-grooming. The stronger positive associations for extreme grooming (OR 4.41; CI 2.9 to 6.8) and high-frequency grooming (OR 3.6; CI 2.3 to 5.4) with cutaneous STIs also persisted when compared with non-grooming. Finally, for pubic lice, non-extreme grooming (OR 2.0; CI 1.3 to 3.0) and low-frequency grooming (OR 2.0; CI 1.3 to 3.1) remained positively associated with these STIs. Extreme grooming (OR 1.5; CI 0.8 to 3.0) and high-frequency grooming (OR 1.4; CI 0.8 to 2.6) were not associated with pubic lice when compared with non-grooming (table 3).

DISCUSSION

Knowing the burden STIs have upon society, our primary aim was to evaluate the relation between grooming practices and STIs among a nationally representative sample of US residents. To our knowledge, this is the first national survey to investigate this possible relation. We found that a greater proportion of groomers reported a history of STIs than non-groomers. This positive relation was observed for all STIs, including cutaneous STIs, secretory STIs and pubic lice. However, the nature of these associations varied by grooming practices and type of STI. For cutaneous STIs, a dose–response was observed, whereby extreme groomers had a greater lifetime prevalence of any cutaneous STIs, herpes and HPV, and high-frequency groomers had a greater lifetime prevalence of any cutaneous STIs and HPV. These patterns were less clear for secretory STIs. Although extreme groomers did not have a significant difference in their lifetime prevalence of secretory STIs overall, this association varied widely across individual STIs. High-frequency groomers were also less likely to report gonorrhoea than low-frequency groomers. Finally, for pubic lice, the positive association between grooming and lice was limited to non-extreme and low-frequency groomers. As expected, after adjustment, both extreme grooming and high-frequency grooming were not associated with pubic lice when compared with non-grooming.

Several possible mechanisms may explain our findings. First, grooming may cause epidermal microtears, which may increase the risk of STIs, particularly cutaneous, viral STIs. This mechanism was recently proposed for grooming and molluscum contagiosum.[7] This mechanism is also consistent with our observed dose–response relation between grooming and cutaneous STIs, as more extreme and/or frequent grooming should, in theory, result in a greater number and frequency of epidermal microtears and thus a greater risk of cutaneous STIs. The impact that HPV vaccine has on groomers and cutaneous STIs is unknown. As a second possible explanation for our findings, shared use of grooming tools may lead to STI transmission and a positive relation between grooming and STIs. For instance, there has been one report of HIV transmission among brothers sharing a razor blade;[17] however, transmission of HIV via non-sexual, non-needle sharing, household contacts of persons with HIV is extraordinarily rare.[18] With regard to gonorrhoea and chlamydia, the most common secretory STIs among groomers, these bacterial infectious agents have not been reported on inanimate object(s). Therefore, we believe that shared use of grooming tools is highly unlikely to explain our positive findings. As a third possible explanation for our findings, individuals who groom may be more likely to engage in risky sexual behaviours than those who do not groom. Although we adjusted our analyses for lifetime sexual partners, it is still possible that our findings may have been confounded by risky sexual behaviours. Finally, several mechanisms may work together to explain our findings. For instance, our stronger findings for cutaneous STIs may be explained by both microtears and residual confounding. Our findings for secretory STIs may be explained solely by residual confounding, for example, unmeasured sexual behaviour practices, self-reporting biases and/or STI recall biases. The positive relations between pubic lice and grooming, which were limited to non-extreme and low-frequency grooming, may reflect residual confounding masking a likely protective association between grooming and lice acquisition. This type of protective association was observed in a prior report and was attributed to removal of the hairs where louse eggs can hatch.[8] Lastly, reverse causality may explain all associations whereby respondents become groomers following a recent STI. Future,

prospective studies with more detailed STI risk information will be necessary to disentangle these possible mechanisms. Beyond epidemiological correlation, the clinical impact to which grooming affects STIs remains to be seen.

Irrespective of the ultimate underlying mechanisms, we believe that a better understanding of the relation between grooming and STIs may be useful for STI risk reduction. For instance, if our positive findings reflect a statistical correlation between grooming and STI acquisition, this information could be used to target STI risk prevention. Future, prospective studies examining this correlation are warranted. Grooming is known to be a surrogate for sexual activity[1 2] and could prompt physicians to inquire about safer sex practices if evidence of grooming is seen on physical examination. Alternatively, if grooming-induced epidermal microtears are found to increase STI risk, then groomers could be counselled to reduce their amount or frequency of grooming, or to delay sexual activity after grooming, to allow the skin to re-epithelise. Finally, if grooming is found to protect against lice, individuals at risk for pubic lice could be counselled to remove their pubic hair.

Our study has limitations. First, it was cross-sectional; therefore, we were not able to determine the timing of grooming relative to STI acquisition to inform causation. Second, we did not assess safe sex practices (eg, condom usage) of respondents. To control for STI risk, we used the number of lifetime sexual partners as a surrogate for risky sexual behaviour, but more detailed information should be collected in future studies. Our survey assessed intimate topics that may have inhibited honest responses. Our exposure and outcome were both sensitive and self-reported, which limits reliability. The impact of underdiagnosed STIs is unknown. Furthermore, our findings may have been influenced by recall bias if respondents who were willing to report their grooming experiences honestly. Certain STIs inherently have a greater probability of recall bias (eg, syphilis) and have varying degrees of prevalence across populations, which may account for the differential in STI self-reporting.

Conclusions
Roughly 13% of groomers from our nationally distributed survey reported a history of STIs. Pubic hair grooming was positively correlated with a lifetime history of cutaneous STIs, secretory STIs and pubic lice. Future, prospective studies are warranted to confirm our cross-sectional findings and to eluci-

date the underlying mechanisms for their insight into new STI risk-reduction strategies. Depending on the underlying mechanisms, these strategies might take the form of delayed sexual activity following grooming to allow re-epithelialisation and sexual risk education for groomers.

REFERENCES
1　Herbenick D, Hensel D, Smith NK, et al. Pubic hair removal and sexual behavior: findings from a prospective daily diary study of sexually active women in the United States. J Sex Med 2013;10:678–85.
2　Bercaw-Pratt JL, Santos XM, Sanchez J, et al. The incidence, attitudes and practices of the removal of pubic hair as a body modification. J Pediatr Adolesc Gynecol 2012;25:12–14.
3　Butler SM, Smith NK, Collazo E, et al. Pubic hair preferences, reasons for removal, and associated genital symptoms: comparisons between men and women. J Sex Med 2015;12:48–58.
4　Herbenick D, Schick V, Reece M, et al. Pubic hair removal among women in the United States: prevalence, methods, and characteristics. J Sex Med 2010;7:3322–30.
5　Glass AS, Bagga HS, Tasian GE, et al. Pubic hair grooming injuries presenting to U.S. emergency departments. Urology 2012;80:1187–91.
6　Moscicki AB. Impact of HPV infection in adolescent populations. J Adolesc Health 2005;37(6 Suppl):S3–9.
7　Desruelles F, Cunningham SA, Dubois D. Pubic hair removal: a risk factor for 'minor' STI such as molluscum contagiosum? Sex Transm Infect 2013;89:216.
8　Armstrong NR, Wilson JD. Did the "Brazilian" kill the pubic louse? Sex Transm Infect 2006;82:265–6.
9　DeMaria AL, Berenson AB. Prevalence and correlates of pubic hair grooming among low-income Hispanic, Black, and White women. Body image 2013;10:226–31.
10　DeMaria AL, Flores M, Hirth JM, et al. Complications related to pubic hair removal. Am J Obstet Gynecol 2014;210:528 e1–5.
11　Mark H, Jordan ET, Cruz J, et al. What's new in sexually transmitted infection management: changes in the 2010 guidelines from the Centers for Disease Control and Prevention. J Midwifery Womens Health 2012;57:276–84.
12　Workowski KA, Berman S, Centers for Disease C, Prevention. Sexually transmitted diseases treatment guidelines, 2010. MMWR Recomm Rep 2010;59(RR-12):1–110.
13　Gaither TW, Truesdale M, Harris CR, et al. The influence of sexual orientation and sexual role on male grooming-related injuries and infections. J Sex Med 2015;12:631–40.
14　GfK. KnowledgePanel (R) Design Survey http://www.gfk.com/Documents/GfK-KnowledgePanel-Design-Summary.pdf (accessed 28 Nov 2014).
15　Chang L, Krosnick JA. National surveys via Rdd telephone interviewing versus the internet: comparing sample representativeness and response quality. Public Opinion Q 2009;73:641–78.
16　Mentzer RM Jr, Golden GT, Chandler JG, et al. A comparative appraisal of emphysematous cholecystitis. Am J Surg 1975;129:10–15.
17　Centers for Disease C, Prevention. HIV transmission between two adolescent brothers with hemophilia. MMWR Morb Mortal Wkly Rep 1993;42:948–51.
18　Simonds RJ, Chanock S. Medical issues related to caring for human immunodeficiency virus-infected children in and out of the home. Pediatr Infect Dis J 1993;12:845–52.

Key messages

- ▶ In a large, nationally representative sample of US residents, intensity and frequency of pubic hair grooming were positively related to STI history.
- ▶ Specifically, herpes, human papillomavirus, syphilis and molluscum were more common among groomers after adjusting for age and number of lifetime sexual partners.
- ▶ Clinical awareness of grooming behaviours may provide insight into STI history.

STI

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Notes