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Risk perception and interest in HIV pre-exposure prophylaxis among men who have sex with men with rectal gonorrhea and chlamydia infection

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Abstract

Rectal gonorrhea and chlamydia infections are associated with significantly increased risk of HIV transmission among gay, bisexual, and other men who have sex with men (MSM). MSM diagnosed with rectal gonorrhea or chlamydia may benefit from pre-exposure prophylaxis (PrEP) for HIV prevention. We analyzed HIV risk perception, PrEP interest, and sexually transmitted infection (STI) test results among MSM presenting to a publicly-funded STI clinic from 2014–2016. A total of 401 MSM were tested for rectal STIs during the study period; 18% were diagnosed with rectal gonorrhea or chlamydia infection. Patients who perceived themselves to be at medium or high risk for HIV were significantly more likely to express interest in PrEP compared to those who reported low or no perceived risk (OR=1.88, 95% CI 1.13–3.11; $p=0.014$). However, there was no significant difference in perceived HIV risk between those who were diagnosed with a rectal STI and those who were not. Although rectal STIs are a significant risk factor for HIV infection, MSM diagnosed with a rectal STI did not perceive themselves to be at increased risk for HIV infection, indicating a potential barrier to successful PrEP implementation in this population.

Keywords

STI; PrEP; Extragenital; MSM

INTRODUCTION

Gay, bisexual, and other men who have sex with men (MSM) bear a disproportionate burden of HIV and other sexually transmitted infections (STI) in the United States (US) (Centers for Disease Control and Prevention, 2016a). Although MSM constitute only about 4% of the US population (Purcell et al., 2012), they accounted for nearly 70% of all new HIV diagnoses in 2015 (Centers for Disease Control and Prevention, 2016a). Additionally, bacterial STIs, such as gonorrhea (*Neisseria gonorrhoeae*) and chlamydia (*Chlamydia trachomatis*), accounted for nearly 1.5 million total diagnoses in the US in 2015, a marked increase from previous years, which has been attributed largely to increasing incidence among MSM (Centers for Disease Control and Prevention, 2016b). There is ample evidence to suggest that STIs are themselves a predictor of increased risk for HIV infection, due to overlapping behavioral risk factors including condomless anal sex, as well as biological mechanisms that may facilitate HIV acquisition. Both gonorrhea and chlamydia may increase the risk of HIV infection (Cohen, 2003; Katz, Dombrowski, Bell, Kerani, & Golden, 2016; Pathela, Braunstein, Blank, & Schillinger, 2013). Rectal infection in particular is a strong indicator of HIV risk among MSM. Having had two rectal gonorrhea or chlamydia infections in the past two years has been found to be associated with an eight-fold increase in incident HIV (Bernstein, Marcus, Nieri, Philip, & Klausner, 2010).

Pre-exposure prophylaxis (PrEP) with daily co-formulated tenofovir disoproxil fumarate and emtricitabine is an effective tool for HIV prevention among high-risk individuals, including MSM (Grant et al., 2010; McCormack et al., 2016; Molina et al., 2015). PrEP is recommended by the Centers for Disease Control and Prevention (CDC) for MSM who have had anal sex without a condom or been diagnosed with an STI in the past six months, and are not in a monogamous relationship with an HIV uninfected partner (U.S. Public Health Service, 2014). However, PrEP uptake among high-risk MSM has been limited by several barriers, including low PrEP awareness, cost, stigma, structural barriers, and low risk perception (Bauermeister, Meanley, Pingel, Soler, & Harper, 2013; Chan, Glynn, et al., 2016; Golub, Gamarel, Rendina, Surace, & Lelutiu-Weinberger, 2013). Engaging MSM at high risk of HIV acquisition has also been challenging and has been limited by the perceived risk of the individual for acquiring HIV (Chan, Glynn, et al., 2016). MSM at highest risk for HIV acquisition include those with rectal STIs, given that they demonstrate a history of condomless receptive anal sex as well as the added biological risk of having a concurrent STI. Furthermore, multiple STIs, including HIV, are often transmitted together (Cohen, 2003). Therefore, engaging MSM with rectal STIs for HIV prevention approaches such as PrEP, and understanding potential barriers to engaging this population, is critical.

The goal of this study was to describe the prevalence of rectal STIs among MSM attending a publicly-funded STI clinic and to assess whether those at elevated risk for HIV (i.e., with a rectal STI) were more likely to perceive themselves to be at risk and to be interested in PrEP. We also examined whether HIV risk perception and interest in using PrEP differed by rectal STI diagnosis. Findings from this study will inform ongoing approaches to PrEP implementation and engaging those at highest risk of HIV acquisition.

METHODS

This study took place at a publicly-funded STI clinic in New England. All individuals presenting for screening were routinely tested for HIV, syphilis, gonorrhea, and chlamydia. In 2013, a PrEP program was implemented at the clinic in accordance with CDC guidelines (U.S. Public Health Service, 2014). Subsequently, all HIV-negative or status unknown MSM who presented to the clinic were offered education about PrEP during the course of routine clinical care, irrespective of reported behavioral risk factors (Raifman et al., 2017). Staff were trained to deliver brief PrEP education and counseling sessions lasting approximately five minutes. Educational sessions were guided by a one-page informational sheet, and included clinical indications for PrEP, a description of the medication, common side-effects, and clinical care guidelines, followed by an opportunity to discuss any of the patient's questions or concerns regarding PrEP. Following the educational session, but prior to receiving STI testing results, patients completed a brief questionnaire regarding their interest in initiating PrEP. Patients were subsequently referred to the on-site PrEP program if interested. In August of 2014, the clinic began offering all MSM routine extragenital (i.e., pharyngeal and rectal) screening for gonorrhea and chlamydia. All gonorrhea and chlamydia screening is performed using nucleic acid amplification testing (NAAT).

Demographic and behavioral data were reviewed for all MSM presenting to the STI clinic from August 2014 to December 2016. Demographic and behavioral history was collected as part of routine clinical care using an intake form prior to STI testing. Demographic information collected includes sex, race, ethnicity, and health insurance status. Patients also were asked about prior HIV testing, HIV status, and past-year STI diagnoses. Behavioral risk factors included number of sex partners (oral, anal, and vaginal), condom use during sex, any sex partners with unknown HIV status, any anonymous partners, any sex while drunk or high, and any transactional sex in the past 12 months. Patients were also asked to report past-year amphetamine ("In the past 12 months, have you used amphetamines, i.e. Meth, Tina?") and popper use ("In the past 12 months, have you used poppers?"). These substances are associated with significantly increased risk of seroconversion among MSM and have been found to be prevalent among MSM in the Northeastern US in previous studies (Plankey et al., 2007). Self-perceived risk of HIV acquisition was assessed by asking patients at intake (prior to PrEP education or receiving STI testing results) to rate their self-assessed risk of contracting HIV as high, medium, low, or none. Notably, patients were not presented with a "neutral/unsure" category of risk in order to encourage a thoughtful response. Responses were dichotomized into high/medium vs. low/none for analyses.

After receiving PrEP education, patients were asked whether they had previously heard of PrEP for HIV prevention (yes/no) or had previously taken PrEP (yes/no), and their likelihood of taking PrEP in the future (extremely likely, likely, unlikely, somewhat unlikely or extremely unlikely). For this analysis, PrEP interest was dichotomized as likely verses unlikely. Additionally, patients were asked to endorse reasons for not being interested in taking PrEP, including side effects, costs, potential interaction with alcohol or drugs, taking a medication every day, potential interaction with other medications, and fear that others would think the patient was HIV-positive.

The prevalence of gonorrhea and chlamydia rectal infections was determined at the time of the PrEP education session among patients in the sample. Univariate frequencies and proportions for categorical variables and means and standard deviations for continuous variables were calculated. Bivariate associations between rectal STIs and demographic and behavioral characteristics were examined using Chi-square and Student's *t*-tests. Multivariable logistic regression models adjusting for age, race/ethnicity, insurance status, past year STI diagnosis, and number of receptive anal sex partners – all chosen *a priori* – were used to assess the associations between HIV risk perception, rectal STIs, and PrEP interest. All analyses were conducted using SPSS version 24. Review of patient data was approved by the presiding institutional review board.

RESULTS

A total of 555 HIV-seronegative MSM presented to the STI clinic and received PrEP education between August 2014 and December 2016. MSM that were identified as HIV-positive at the time of clinical visit were excluded from PrEP education sessions and from this analysis. Of these HIV-negative MSM, a total of 401 MSM (72%) were tested for rectal STIs and were included in this analysis. Of these, 89% (*n*=356) reported having sex with other men only (MSM), and 11% (*n*=45) reported having sex with both men and women (MSMW) (Table 1). The majority of the patient population was white (*n*=258, 64%). Over half (*n*=220, 55%) reported having health insurance. Nearly 90% (*n*=349, 87%) of patients reported having ever been tested for HIV. Patients reported an average total number of 8.0 (SD=9.7) sex partners, an average of 3.9 (SD=6.6) insertive anal sex partners, and an average of 4.1 (SD=6.4) receptive anal sex partners in the past 12 months. Patients also reported an average of 7.1 (SD=9.5) oral sex partners. The majority of patients (*n*=250, 62%) reported having sex with anonymous partners in the past 12 months, while 3.0% (*n*=12) patients reported having exchanged sex for money or drugs. Nearly half of patients (*n*=187, 47%) reported having sex with partners whom they were unaware of their HIV status. Over one-third of patients (*n*=150, 37%) reported having sex while intoxicated or high in the past 12 months. Sixty-two patients (16%) reported having been diagnosed with a STI in the past year. Of those who reported their perceived risk for acquiring HIV infection (*n*=368), over a quarter of patients perceived themselves to be at high (*n*=23, 6.3%) or medium (*n*=84, 23%) risk for becoming infected with HIV; more than half of patients (*n*=225, 61%) perceived themselves at being at low risk for HIV; and 9.8% (*n*=36) perceived themselves to be at no risk for HIV infection.

Nearly two-thirds of patients (*n*=257, 64%) reported ever hearing about PrEP. However, only five patients (2.0%) had reported ever taking PrEP. After the education session, 64% (*n*=255) of patients reported that they would likely take PrEP if it was prescribed to them; 44% (*n*=176) indicated that a clinician could follow-up with them about PrEP after the education session. Importantly, 96% of patients (*n*=376) reported that they would use PrEP if they thought they were at high risk for HIV infection. Only 9.2% of patients reported having no concerns about taking PrEP. The most common reasons for reporting not being interested in using PrEP included concerns about medication side-effects (*n*=265, 66%), cost (*n*=231, 58%), potential interaction with alcohol or drugs (*n*=109, 27%), taking a medication every day (*n*=101, 25%), and potential interaction with other medications (*n*=67, 17%). A less

commonly endorsed reason was fear that others would think the patient was HIV-positive ($n=53$, 13%).

Among the 401 MSM included in the analysis, 9.5% tested positive for rectal gonorrhea and 10.0% for rectal chlamydia. Overall, 18% patients ($n=73$) tested positive for at least one rectal STI. In the bivariate analyses, patients with a rectal STI were more likely to be younger (mean 28.1 vs. 31.5 years of age), have more receptive anal sex partners in the past year (6.1 vs. 3.7), and report more condomless anal sex in the past year (94.5% vs. 79.1%) compared to men without a rectal STI (all p -values $<.05$, Table 1). Patients with a rectal STI were also less likely to report having sex with both men and women (6.8% vs. 12%), though the difference was not statistically significant ($p=.191$).

In a bivariate analyses (data not shown), patients who perceived themselves to be at high or medium risk for HIV were significantly more likely to express interest in using PrEP (OR=1.88, 95% CI 1.13–3.11; $p=.014$). However, there were no differences in self-perceived HIV risk for those with a rectal STI compared to those without a rectal STI (OR=.91, 95% CI .49–1.67; $p=.753$). In multivariable analyses, HIV risk perception was significantly associated with PrEP interest (adjusted OR [aOR]=1.80, 95% confidence interval [CI] 1.06–3.04; $p=.030$) and number of receptive anal sex partners in the past year (aOR=1.07, 95% CI 1.02–1.11; $p=.002$) (Table 2). Moreover, even after adjusting for HIV risk perception and other demographic and behavioral risk factors, rectal STI diagnosis was not associated with interest in taking PrEP (Table 3).

DISCUSSION

Our study is among the first to evaluate interest in PrEP among MSM with rectal gonorrhea and chlamydia infections. This study demonstrated an almost 20% prevalence of rectal infections. This is similar to prior studies that demonstrated a high prevalence of extragenital infection among MSM (Chan, Robinette, et al., 2016), and supports current recommendations for both pharyngeal and rectal screening in addition to urogenital (Workowski & Bolan, 2015). A national study of gonorrhea and chlamydia screening among MSM found that that urogenital-only screening would have missed up to 70% of gonorrhea infections and 85% of chlamydia infections (Patton et al., 2014). As rectal infections increase the risk of HIV acquisition, men who engage in receptive anal intercourse should receive rectal screening. MSM should be screened at least annually if sexually active and as often as 3–6 months in the case of concurrent partners and condomless sex (Workowski & Bolan, 2015).

Despite posing high biological risk and indicating presence of high behavioral risk, rectal STIs were not associated with a difference in HIV risk perception in this study. In fact, nearly three-quarters of MSM in the sample who were diagnosed with a rectal STI reported low or no perceived risk prior to learning of the prevalent rectal STI. Moreover, interest in PrEP was only moderate. As hypothesized, perceived HIV risk was associated with interest in taking PrEP. However, having a rectal STI was not associated with PrEP interest, potentially due to the lack of perceived risk for HIV. Low self-perceived HIV risk has previously been found to be a significant barrier to HIV prevention interventions, including

routine HIV testing (Lauby, Bond, Ero lu, & Batson, 2005) and PrEP uptake among MSM in general (Chan, Glynn, et al., 2016).

Given that a history of rectal STIs has been shown to be associated with HIV acquisition – both due to overlapping behavioral risk factors and increase transmissibility – rectal STIs may be an appropriate indicator for PrEP eligibility (Pathela et al., 2013). Younger age, more receptive anal sex partners, and less condom use were more common among MSM who tested positive for a rectal STI compared to those that did not. Some PrEP implementation programs already use the presence of a rectal STI as a criteria for PrEP initiation (Public Health - Seattle & King County & Washington State Department of Health, 2015). However, if MSM with a rectal STI who report behaviors associated with HIV infection do not perceive themselves to be at risk for HIV, they may not be interested in using or motivated to use PrEP for HIV prevention. As such, interventions directed toward increasing uptake of PrEP among MSM with rectal STIs are needed. Focusing on increasing perceived risk for HIV in conjunction with, and not in lieu of, increasing knowledge about PrEP among these high-risk men may be an appropriate strategy (Kowalewski, Henson, & Longshore, 1997). Prevention efforts should not exclude other groups given that MSM without rectal STIs may also be at significant risk of HIV infection.

These findings must be interpreted in the context of several limitations. First, this sample only includes individuals who presented at a single STI clinic, which may limit generalizability. Likewise, individuals who were initially believed to be HIV-negative or serostatus unknown but subsequently tested positive for HIV after having completed the PrEP education session and questionnaire are included in the sample, which may have impacted potential interest in PrEP if these individuals believed they had been exposed to HIV. Second, perceived risk for HIV was measured using a single item question. It is possible that incorporating a validated multi-item perceived risk scale would have yielded more complete information about perceived risk for HIV infection. Additionally, the MSM screened in this study were provided information about PrEP and immediately surveyed about their prior knowledge and interest. This may have inflated the number of individuals interested in PrEP due to social desirability bias. Notably, MSM were unaware of their STI test results when they were provided with PrEP education. Perceived risk for HIV may very well increase upon receiving positive STI test results. Further work is needed to identify changes in perceptions of HIV risk among MSM who receive positive STI test results compared to those who receive negative STI test results. Finally, although MSM were asked to report their risk behaviors in a safe and private environment, the stigma surrounding sexual risk may have led to underreporting of such behaviors. It is possible that risk behaviors were actually higher than reported here.

In conclusion, rectal gonorrhea and chlamydia infections significantly increase the risk of HIV acquisition and are common among MSM presenting for HIV/STI screening. PrEP is a potential HIV prevention approach that may mitigate risk in this group. However, MSM with rectal STIs may not perceive themselves at higher risk of HIV infection prior to receiving an STI diagnosis. Future interventions focused on increasing PrEP uptake among this at-risk population will benefit from identifying MSM with rectal STIs and increasing their perceived risk for HIV in order to increase interest in PrEP and ultimate uptake.

REFERENCES

- Bauermeister JA, Meanley S, Pingel E, Soler JH, & Harper GW (2013). PrEP awareness and perceived barriers among single young men who have sex with men in the United States. *Current HIV Research*, 11(7), 520–527. [PubMed: 24476355]
- Bernstein KT, Marcus JL, Nieri G, Philip SS, & Klausner JD (2010). Rectal gonorrhea and chlamydia reinfection is associated with increased risk of HIV seroconversion. *Journal of Acquired Immune Deficiency Syndromes* (1999), 53(4), 537–543. 10.1097/QAI.0b013e3181c3ef29 [PubMed: 19935075]
- Centers for Disease Control and Prevention. (2016a). Diagnoses of HIV infection in the United States and dependent areas, 2015. *HIV Surveillance Report*, 27.
- Centers for Disease Control and Prevention. (2016b). Sexually transmitted disease surveillance 2015. Atlanta, GA.
- Chan PA, Glynn TG, Oldenburg CE, Montgomery MC, Robinette AE, Almonte A, ... Nunn AS (2016). Implementation of pre-exposure prophylaxis for HIV prevention among men who have sex with men at a New England sexually transmitted diseases clinic. *Sexually Transmitted Diseases*, 43(11), 717–723. 10.1097/OLQ.0000000000000514 [PubMed: 27893604]
- Chan PA, Robinette A, Montgomery M, Almonte A, Cu-Uvin S, Lonks JR, ... Hardy EJ (2016). Extragenital infections caused by *Chlamydia trachomatis* and *Neisseria gonorrhoeae*: a review of the literature. *Infectious Diseases in Obstetrics and Gynecology*, 2016, e5758387 10.1155/2016/5758387
- Cohen MS (2003). HIV and sexually transmitted diseases: lethal synergy. *Topics in HIV Medicine*, 12(4), 104–107.
- Golub SA, Gamarel KE, Rendina HJ, Surace A, & Lelutiu-Weinberger CL (2013). From efficacy to effectiveness: facilitators and barriers to PrEP acceptability and motivations for adherence among MSM and transgender women in New York City. *AIDS Patient Care and STDs*, 27(4), 248–254. 10.1089/apc.2012.0419 [PubMed: 23565928]
- Grant RM, Lama JR, Anderson PL, McMahan V, Liu AY, Vargas L, ... Glidden DV (2010). Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *New England Journal of Medicine*, 363(27), 2587–2599. 10.1056/NEJMoa1011205 [PubMed: 21091279]
- Katz DA, Dombrowski JC, Bell TR, Kerani RP, & Golden MR (2016). HIV incidence among men who have sex with men following diagnosis with sexually transmitted infections. *Sexually Transmitted Diseases*, 43(4), 249–254. 10.1097/OLQ.0000000000000423 [PubMed: 26967302]
- Kowalewski MR, Henson KD, & Longshore D (1997). Rethinking perceived risk and health behavior: a critical review of HIV prevention research. *Health Education & Behavior*, 24(3), 313–325. 10.1177/109019819702400305 [PubMed: 9158976]
- Lauby JL, Bond L, Ero lu D, & Batson H (2005). Decisional balance, perceived risk and HIV testing practices. *AIDS and Behavior*, 10(1), 83–92. 10.1007/s10461-005-9029-7
- McCormack S, Dunn DT, Desai M, Dolling DI, Gafos M, Gilson R, ... Gill ON (2016). Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *Lancet*, 387(10013), 53–60. 10.1016/S0140-6736(15)00056-2 [PubMed: 26364263]
- Molina J-M, Capitant C, Spire B, Pialoux G, Cotte L, Charreau I, ... Delfraissy J-F (2015). On-demand preexposure prophylaxis in men at high risk for HIV-1 infection. *New England Journal of Medicine*, 373(23), 2237–2246. 10.1056/NEJMoa1506273 [PubMed: 26624850]
- Pathela P, Braunstein SL, Blank S, & Schillinger JA (2013). HIV incidence among men with and those without sexually transmitted rectal infections: estimates from matching against an HIV case registry. *Clinical Infectious Diseases*, 57(8), 1203–1209. 10.1093/cid/cit437 [PubMed: 23800942]
- Patton ME, Kidd S, Llata E, Stenger M, Braxton J, Asbel L, ... Weinstock H (2014). Extragenital gonorrhea and chlamydia testing and infection among men who have sex with men--STD Surveillance Network, United States, 2010–2012. *Clinical Infectious Diseases*, 58(11), 1564–1570. 10.1093/cid/ciu184 [PubMed: 24647015]
- Plankey MW, Ostrow DG, Stall R, Cox C, Li X, Peck JA, & Jacobson LP (2007). The relationship between methamphetamine and popper use and risk of HIV seroconversion in the multicenter

- AIDS cohort study. *Journal of Acquired Immune Deficiency Syndromes* (1999), 45(1), 85–92. 10.1097/QAI.0b013e3180417c99 [PubMed: 17325605]
- Public Health - Seattle & King County, & Washington State Department of Health. (2015). Preexposure prophylaxis (PrEP) implementation guidelines 2015. Seattle, WA.
- Purcell DW, Johnson CH, Lansky A, Prejean J, Stein R, Denning P, ... Crepaz N (2012). Estimating the population size of men who have sex with men in the United States to obtain HIV and syphilis rates. *The Open AIDS Journal*, 6, 98–107. 10.2174/1874613601206010098 [PubMed: 23049658]
- Raifman J, Nunn AS, Oldenburg CE, Montgomery MC, Fogarty AE, Almonte A, ... Chan PA (2017). An evaluation of a clinical pre-exposure prophylaxis education intervention among men who have sex with men. *Health Services Research*, Epub ahead of print. 10.1111/1475-6773.12746
- U.S. Public Health Service. (2014). Preexposure prophylaxis for the prevention of HIV infection in the United States – 2014: a clinical practice guideline. Atlanta, GA: Centers for Disease Control and Prevention.
- Workowski KA, & Bolan GA (2015). Sexually transmitted diseases treatment guidelines, 2015. *MMWR Recommendations and Reports*, 64(3), 1–138.

Table 1.

Demographics and behaviors of MSM attending an STI clinic (August 2014-December 2016)

Measure	Total	Rectal Infections <i>N</i> =73(18.2%)	No Rectal Infections <i>N</i> =328(81.8%)	<i>p</i> -value
Mean (SD)				
<i>Age (years)</i>	30.9 (11.5)	28.1(9.3)	31.5(11.8)	.022
<i>Receptive anal sex partners, past year</i>	4.1 (6.4)	6.1 (9.6)	3.7 (5.4)	.003
<i>Insertive anal sex partners, past year</i>	3.9 (6.6)	4.2 (7.6)	3.9 (6.4)	.717
<i>N</i> (%)				
<i>Race/ethnicity</i>				
White, non-Hispanic	258 (64.3)	49(67.1)	209 (63.7)	.583
Non-White	143 (35.7)	24 (32.9)	119(3.63)	
<i>Has health insurance</i>	220 (54.9)	38 (52.1)	182 (55.5)	.594
<i>Sex with women</i>	45 (11.2)	5 (6.8)	40 (12.2)	.191
<i>Ever had an HIV test</i>	349 (87.3)	61 (84.7)	288 (87.8)	.478
<i>Any condomless anal sex, past year</i>	323 (80.5)	69 (94.5)	254 (79.1)	.002
<i>Sex with anonymous partners, past year</i>	250 (62.3)	49 (67.1)	201 (61.3)	.351
<i>Sex with partner (s) of unknown HIV status, past year</i>	187(46.6)	37 (50.7)	150 (45.7)	.443
<i>History of exchanging sex for money/drugs, past year</i>	12(3.0)	2 (2.7)	10 (3.0)	.889
<i>STI diagnosis, past year</i>	62(15.5)	14 (25%)	70 (19.5%)	.335
<i>Intoxicated and/or high during sex, past year</i>	150 (37.4)	30 (41.1)	120 (36.6)	.471
<i>Used amphetamines, past year</i>	18 (4.5)	4 (5.5)	14(4.3)	.651
<i>Used poppers, past year</i>	109 (27.2)	22 (30.1)	87 (26.5)	.530
<i>Perceived HIV Risk</i>				
High	23 (6.3)	3 (4.8)	20 (6.5)	.799
Medium	84 (22.8)	14 (22.6)	70 (22.9)	
Low	225 (61.1)	37 (59.7)	188(61.4)	
None	36 (9.0)	8 (12.9)	28 (9.2)	
<i>Ever heard about PrEP</i>	257 (64.1)	43 (58.9)	214 (65.2)	.307
<i>Ever taken PrEP</i>	5 (2.0)	0 (0.0)	5 (2.3)	.310
<i>Interested in PrEP</i>	255 (64.4)	53 (72.6)	202 (62.5)	.105

MSM: men who have sex with men, STI: sexually transmitted infection

Table 2.

Multivariable logistic regression examining correlates of high/medium perceived HIV risk among MSM attending an STI clinic (August 2014-December 2016).

Measure	aOR (95% CI)	p-value
<i>PrEP Interest</i>		
Yes	1.80 (1.06,3.04)	.030
No	1.0	
<i>Rectal STI</i>		
Yes	.75 (0.39, 1.44)	.386
No	1.0	
<i>Age</i>	1.00 (.98, 1.02)	.936
<i>Race/ethnicity</i>		
White, non-Hispanic	1.25(0.75,2.07)	.392
No n-white	1.0	
<i>Health insurance</i>		
Yes	.94(0.58, 1.51)	.797
No	1.0	
<i>STI diagnosis, past year</i>		
Yes	.99 (.52, 1.90)	.994
No	1.0	
<i>Number of receptive anal sex partners, past year</i>	1.07(1.02, 1.11)	.002

STI: sexually transmitted infection, PrEP: pre-exposure prophylaxis, MSM: men who have sex with men, aOR: adjusted odds ratio

Table 3.

Multivariable logistic regression examining associations between a prevalent rectal STI and PrEP interest, perceived HIV risk, and other demographic and behavioral correlates among MSM attending an STI clinic (August 2014-December 2016)

Measure	aOR (95% CI)	p-value
<i>PrEP Interest</i>		
Yes	1.16 (.62, 2.15)	.646
No	1.0	
<i>Perceived HIV Risk</i>		
High/Medium	.77(0.41, 1.48)	.437
Low/None	1.0	
<i>Age</i>	.96 (.093, 0.99)	.011
<i>Race/ethnicity</i>		
White, non-Hispanic	1.22(0.66,2.24)	.528
No n-white	1.0	
<i>Health insurance</i>		
Yes	.87(0.49, 1.53)	.621
No	1.0	
<i>STI diagnosis, past year</i>		
Yes	.70 (.29, 1.67)	.420
No	1.0	
<i>Number of receptive anal sex partners, past year</i>	1.05(1.01, 1.09)	.009

STI: sexually transmitted infection, PrEP: pre-exposure prophylaxis, MSM: men who have sex with men, aOR: adjusted odds ratio