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Abscess and Self-Treatment Among Injection Drug Users at Four California Syringe Exchanges and Their Surrounding Communities

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Abstract

This study aimed to identify the prevalence and determinants of soft tissue infections and self-treatment among injection drug users (IDUs) in California. The study interviewed 864 IDUs in California using computer-assisted personal interview (CAPI) from 2003 to 2005. Multiple logistic regression analyses were performed to examine adjusted associations for recent abscess and abscess self-treatment. In these analyses, Latinos had higher odds than African Americans to self-treat, while IDUs reporting a usual place of health care had lower odds of self-treatment. Findings suggest an expansion of wound care facilities to mitigate the self-treatment of abscesses, with special consideration to Latinos.

Keywords

soft tissue infection; abscess; injection drug users; self-treatment; syringe exchange

INTRODUCTION

Injection drug users (IDU) are often afflicted by serious health hazards, including overdose, blood-borne diseases (particularly HIV and HCV), and soft tissue infections. While studies on blood-borne diseases and overdoses are numerous in the scientific literature, soft tissue infections such as abscesses and cellulitis have received less attention. Abscesses, as defined

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The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

in this study, are subcutaneous masses, filled with pus and debris, resulting from one's bodily defenses against an outside infectious agent. Abscesses result from introduction of an infectious agent, often *Staphylococcus aureus*, into the body through unsterile injection equipment or unclean skin. Antibiotics and lancing, or cutting open the infection, are the standard medical treatments for an uncomplicated abscess. Although treatment of uncomplicated abscesses can be relatively easy, large metropolitan counties and hospitals have been particularly burdened by the relatively high prevalence of soft tissue infections among IDUs, often a result of delayed treatment (Center for Disease Control and Prevention (CDC), 2001; Heinzerling, Etzioni et al., 2006).

Studies of the prevalence of abscesses and cellulitis in samples of community-recruited IDUs have found that a quarter to a third reported a recent occurrence. For instance, in San Francisco, California, a study found that 54 (32%) of 169 IDUs in one neighborhood had current abscesses, cellulitis, or both during a physical examination (Binswanger, Kral, Bluthenthal, Rybold, & Edlin, 2000). In Vancouver, Canada, and Tijuana, Mexico, studies reported that ~20% of IDUs had an abscess in the prior 6 months (Lloyd-Smith et al., 2005; Pollini et al., 2010); in Denver, Colorado, 29% of IDUs reported an abscess in the prior year (Phillips & Stein, 2010). Abscesses can be very painful and prompt treatment, mostly with antibotics, may succeed in avoiding more costly and invasive surgical incision and drainage of abscess wounds. Societal stigma of injection drug use may result in IDUs choosing self-treatment over seeking medical care that may produce scrutiny or judgment by doctors and nurses (Smedley, Stith, & Nelson, 2006). Self-treatment or street-treatment procedures are often performed by untrained individuals in nonsterile environments and may increase the risk for further complications. Studies have shown that 27–40% of IDUs had at least once lanced their own abscess, and 16–26% had self-medicated with illegally purchased antibiotics (Binswanger et al., 2000; Starrels, Barg, & Meglay, 2008; Takahashi, Baernstein, Binswanger, Bradley, &Merrill, 2007). The improper use of antibiotics has resulted in a growing medical concern over the development of drug-resistant strains of bacteria; this may be further exasperated by the self-medication of abscesses by IDUs (Levy, 1998). Furthermore, treatment for abscesses at wound care clinics and emergency rooms provide venues to begin dialogue between IDUs and trained providers on alternatives to risky behaviors and disease testing (Binswanger et al., 2008). However, when IDUs self-treat their wounds, this opportunity for dialogue is lost. Additionally, the high cost associated with professional medical treatment presents a substantial barrier to care, especially among a population that tends to be uninsured (Takahashi et al., 2007). Ciccarone et al. found that 64% of IDUs treated for sexually transmitted infections (STIs) at San Francisco General Hospital between 1996 and 2000 were uninsured; consequently, this places a large economic burden on the public as often easily treatable skin infections result in complex infections (CDC, 2001).

Due to the high prevalence estimates, frequent selfcare reports, and the high cost of medical treatment, more studies on factors associated with abscess self-care among community-recruited IDUs are needed. Most prior studies have used hospital chart reviews or sampled in an emergency department. There are a limited number of studies that have analyzed population characteristics of IDUs who self-treat without seeking professional medical care

(Murphy et al., 2001; Pollini et al., 2010; Takahashi et al., 2007). This study aims to examine the prevalence of abscesses and self-treatment among IDUs for the purposes of identifying potential areas for future health promotion activities to reduce morbidities among this population.

METHODS

Procedures

This is a cross-sectional analysis of baseline data from a longitudinal multisite comparative study of IDUs who do and do not use syringe exchange programs (SEPs). Study participants were recruited from four SEPs and non-SEP IDUs in communities served by these programs in Los Angeles, Oakland, and Berkeley, California. All data of SEP clients were taken from four unique programs: Bienestar (Los Angeles), Homeless Health Care of Los Angeles (Los Angeles), Needle Exchange Emergency Distribution (Berkeley), and HIV Education and Prevention Project of Alameda County (Oakland). The four SEPs were chosen from the 24 California exchanges due to their variation in needle distribution policies and onsite ancillary services. There were four requirements for an SEP to be considered for this study —they needed to be: (1) legally sanctioned by their specific county, (2) operate at various locations in urban settings, and (3) be considered large to very large (distribute between 100,000 and 850,000 syringes).

The individual SEPs provided services at multiple locations and times in an effort to reach the maximum number of clients. Given the variation in the average number of clients served at each location and time, data collection hours were adjusted to occur proportionally to the average client use per location over the 6 months prior to initiation of data collection (information provided by local SEP staff). For example, if one site generated 75% of clients, then 75% of data collection time would be spent at that site. To recruit SEP clients, study staff approached all individuals that used SEP sites during data collection periods. The study subjects recruited through the SEP were required to be actively exchanging or receiving syringes, self-reporting injection drug use in the last 30 days, as verified through physical inspection of tract marks, and 18 years of age or older (Cagle, Fisher, Senter, Thumond, & Kaster, 2002). A unique identifier was created for each participant to ensure exclusion of repeat individuals in later cohorts. Interviews for SEP-recruited IDUs were completed at the SEP site in a private or semi-private setting.

Community participants were contacted through street outreach, referrals from other providers, and word of mouth among IDUs using a targeted sampling approach (Bluthenthal & Watters, 1995; Watters & Biernacki, 1989). Targeted sampling methods have been found to yield a sample very similar to those obtained using respondent-driven sampling (Kral et al., 2010). The community selections were identified based on locations suggested by SEP program staff and zip codes provided by IDUs in a previous study conducted on the four participating SEPs. The data were compiled to create a recruitment area to be utilized by outreach workers for identification of non-SEP study participants. Non-SEP study participants were defined as individuals who had not directly utilized SEP services in the past 6 months. Moreover, community participants were required to be over 18 years of age and to have self-reported injection drug use in the past 30 days, similar to SEP participants.

Interviews were conducted at the convenience of the IDUs at service provider locations, homes of the individuals, and semi-public locations (e.g., park bench away from other people, in a car, fast food restaurant) that were free from overt distractions.

A total of 864 IDUs completed baseline surveys. Of the 864 total consented participants, eight respondents were missing information on the primary variable of interest, recent abscess, and one participant reported no injections in the past 30 days, and were thus removed, leaving 858 participants for analysis. All study participants completed a questionnaire at baseline and at 6-month follow-up using a computer-assisted personal interview (CAPI), which provided data on drug use, sex risk, abscess, other health problems, and demographics. All study protocols were approved by the institutional review boards of the Rand Corporation, University of California San Francisco, RTI International, and San Diego State University.

Measures

Two outcome variables were evaluated in the current study—report of abscess in the past 6 months and self-treatment of abscess (Binswanger et al., 2000; Heinzerling, Kral et al., 2006). Self-report of an abscess in the past 6 months was captured using the following question: “During the last six months, did you have an abscess related to injection drug use? (Including any enduring lumps, even if they did not “come to a head,” drain, or require treatment of any kind.)”. If participants had more than one lifetime abscess, data were collected on their response in the following item: “Thinking about the last abscess you had, how did you deal with it?” Responses were reviewed and categorized into two groups, professional care (e.g., “went to hospital”, “doc-antibiotic”, “went to ER”) or nonprofessional care (e.g., “wrapped it tight, busted itself”, “self-treatment”, “let it go until it burst”, “illegal antibiotics, no doctor”). Participants reporting vague responses (e.g., “antibiotic”) not clearly identifying the location or type of care were removed from the second portion of the analysis assessing nonprofessional treatment (n = 15). Thus, only those participants who had reported a previous abscess and clearly described some form of treatment for their abscess were included in the analysis.

Primary demographic characteristics were assessed, including: race/ethnicity, biological gender, and age. Race was categorized into four categories: Black, White, Latino, and Other. The Other category included the small number of Asian, Pacific-Islander, Indian, and those endorsing multiple races. Age was categorized into four categories: less than 30 years old, 30–39 years old, 40–49 years old, and more than 50 years old. The length of injection history was categorized into three groups: less than 10 years, 10–19 years, and more than 20 years of injecting illegal drugs. Injection frequency was grouped into 1–29, 30–89, or 90 plus injections per month. Percentage of time the participant cleaned his/her skin prior to injection was evaluated as a continuous variable. Usual place of care was assessed through a single dichotomous question asking: “Is there one person or place in particular where you usually go when you are sick or want advice about your health?”. A follow-up question asked: “What is that usual place?” (i.e., a private doctor’s office, a community clinic, hospital outpatient clinic, emergency room, syringe exchange program, other, refuse to answer).

Statistical Analysis

A bivariate analysis with an alpha level of less than 0.05 was conducted comparing IDUs with abscesses during the last 6 months with IDUs without abscesses by all relevant variables, which were selected on the basis of their association with the outcome of interest in prior studies. An additional bivariate analysis was conducted among the subgroup that had abscesses to determine self-treatment prevalence. All bivariate analyses were tested using Pearson's Chi-squared tests for categorical variables, univariate logistic regression for continuous variables, and Fisher's exact Chi-squared test for categorical variables with low-cell observations. Variables reaching $P < 0.05$ in the bivariate analysis were entered into the multivariable logistic regression models. Two multivariable logistic regression models were fit using SAS version 9.1.3 (SAS Institute Inc., Cary, NC) to determine the association between IDUs (1) self-reporting having an abscess in the last 6-months and (2) reporting self-treatment of last lifetime abscess, and the independent variables of interest. Models were fit using backward elimination to determine the best model. Unadjusted crude associations were estimated to examine the association between each outcome and the covariates of interest. Next, a logistic regression model was fit with all individual covariates. Last, all reasonable interactions terms were entered one at a time into the main effects model, although none were found significant. Adjusted odds ratios (AOR) and 95% confidence intervals (95% CI) are reported. Type I error was controlled for by only examining variables previously shown to be associated with the outcome of interest and identified as significant in the bivariate analysis.

RESULTS

Among the 858 participants with complete data, 71% were men, 37% were 40–49 years old, 41% were 50+ in age, 36% were Black, 21% were White, and 35% were Latino (Table 1). The majority of participants had been injecting for over 20 years (67%) and 90 or more times in the past month (50%).

Recent Abscess

As shown in Table 1, a recent abscess was reported by 37% ($n = 320$) of the study participants. The bivariate analysis showed that there was no statistical association between a recent abscess and age, race, education, homelessness, or accessing an SEP. Women had higher odds of a recent abscesses than men ($P = 0.002$). Injecting for 20 years or more ($P = 0.01$), injecting 90 or more times per day ($P = 0.02$), and heroin use ($P = 0.01$) were all associated with a recent abscess. Methamphetamine users had lower odds of a recent abscess than non-methamphetamine users ($P = 0.002$). Among injection behaviors, percentage of time the participant cleaned skin prior to injection ($P = 0.03$) and number of times the participant injected into a vein in past 30 days ($P = 0.01$) were found to be negatively associated, while number of times the participant did skin-popping in past 30 days was positively associated with a recent abscess ($P < 0.001$) (See Table 2).

In the multiple logistic regression (Table 3), recent abscess was associated with the number of skin-popping injections (AOR: 1.21, 95% CI: 1.2–1.2) and women (AOR: 1.42, 95% CI:

1.01–2.00). Skin cleaning with alcohol swabs prior to injection was negatively associated with recent abscess (AOR: 0.96, 95% CI: 0.92–0.99).

Self-Treatment of Abscesses

Of the participants reporting a prior lifetime abscess and describing some type of treatment (n = 457), 252 (55%) had been treated by a doctor, 143 (31%) reported self-lancing, 22 (5%) reported self-medication with illegally purchased antibiotics, and 40 (9%) self-treated with some form of homeopathic care (Table 4). In the bivariate analysis, race and injection frequency were found to be significantly associated with self-treatment, while participants with a usual place of health care was negatively associated with self-treatment (Table 5).

In the multivariable analysis (Table 6), a significant relationship was found between race and self-treatment. No differences were found between Whites and Latinos or African Americans, but Latinos were significantly more likely to self-treat than African Americans (AOR: 2.83, 95% CI: 1.6–5.1). Having a usual place of care was protective against self-treatment of abscesses after controlling for all other variables in the model (AOR: 0.61, 95% CI: 0.40–0.92).

DISCUSSION

Our results showed that the primary risk factors for abscesses among IDUs were related to the method of injection (skin-popping) and injection hygiene (cleaning skin prior to injection). These findings confirm prior studies that argued for continued educational messages and distribution of prevention supplies (e.g., alcohol swabs) that promote cleanliness and care of the injection site (Binswanger et al., 2000; Murphy et al., 2001; Vlahov & Sullivan, 1992). Alcohol swabs cost less than one cent each, making this an easy and cost-effective means to prevent morbidity and the costs associated with abscess treatment. It may be beneficial to educate individuals on the risk of abscess associated with skin-popping, in addition to the preventative benefits of cleaning the skin prior to injection. Furthermore, a tailored program on proper injection techniques for women may benefit this population, since they had higher odds of recent abscesses as compared with men.

Self-treatment of a recent abscess was reported by nearly 45% of IDUs who reported a prior abscess. Our finding indicates a slightly higher level of self-treatment than the 36% reported by Binswanger and colleagues in San Francisco in 1997, although a higher rate of self-treatment was reported in Tijuana, Mexico (Pollini et al., 2010). This gradient in self-treatment may be associated with a higher proportion of Latinos in our study, as Latinos had a 2.6 odds of self-treatment compared with African Americans, or with differences in access to ambulatory care in the settings. Having medical insurance and being an SEP client were not significantly associated with self-care of abscesses, while having a usual place of care was found to be negatively associated with self-treatment. These findings may be explained by the stigma confronted by IDUs when presenting with an abscess at some healthcare facilities (Smedley et al., 2006). Insurance reduces the burden of cost associated with care, but having a usual place of care can create familiarity with a provider, supporting a level of general rapport and reducing the stigma associated with care.

Reducing barriers to care and implementing prevention programs related to abscesses among IDUs seems warranted. In one study, nearly half of all hospitalizations among IDUs were due to abscess and soft tissue infection (Lloyd-Smith et al., 2010). Another study found that 22% of IDUs receive care due to abscess and soft tissue infections yearly (Lloyd-Smith et al., 2009). According to one estimate, 193 million US dollars were spent on treating abscesses in the United States in 2001 (Takahashi, Maciejewski, & Bradley, 2010). Abscess care has been shown to cost between $185 and $360 per patient, excluding medication and physician fees, in a medical setting, compared with the treatment cost for one IDU's abscess at a Northern California wound care clinic, where the estimated cost was $5 per patient (Grau, Arevalo, Catchpool, & Heimer, 2002). Low-threshold wound care facilities offer IDUs a personalized interaction with providers trained in prevention of IDU-related health concerns, which may educate the individual on prevention strategies and available referrals for immunizations, HIV and Hepatitis C testing, drug treatment facilities, and other indicated preventive care. Grau et al. found that in addition to the client–provider interaction, there was a strong case for the economic benefits of wound care clinics attached to syringe exchanges as opposed to IDUs seeking wound care treatment at local emergency rooms (Grau et al., 2002). These findings support a recommendation to extend current funding of local wound care clinics associated with syringe exchanges to reduce the overutilization of emergency rooms and hospitals for the treatment of uncomplicated STIs.

The results of this study should be viewed in consideration of the limitations of this study. Abscesses were self-reported, not defined through examination by a healthcare professional and could be subject to recall bias. However, a previous study validated self-reports on abscesses in the past 6 months of 399 of their 1057 sampled IDUs who underwent physical examinations in a prior study, finding an 89% agreement between self-report and examination (Vlahov et al., 1992). Additionally, due to the cross-sectional analysis, we are not able to assess the temporal nature of the relationship between the risk behaviors and abscesses. It must also be noted the data were collected from 2003 to 2005; however, there is no reason to believe that significant changes have occurred in injection culture since the time of this study. Although there was a possibility for the introduction of a selection bias, extensive efforts were taken to prevent a bias, including: data collection time was assigned proportionally to reports of client use per SEP coordinator, physical inspection of tract marks were conducted to ensure the participant was an active IDU, a unique identifier was created for each participant to ensure exclusion of repeat individuals, and extensive efforts were taken to ensure a community sample representative of the SEP.

It is important that future studies are conducted to assess the type dosage, and duration medication was taken by IDUs self-treating abscesses with illegally purchased antibiotics to expand our understanding of those behaviors. Further investigations regarding these self-treatment behaviors will aid in the creation of tailored messages appropriate for this population. Self-treatment of abscesses with illegally purchased antibiotics may have severe consequences on the proliferation of antibiotic-resistant strains of abscess-causing bacteria. Given the growing prevalence of a specific strain of methicillin-resistant *Staphylococcus aureus* (MRSA) designated ST8:S, as discussed by Frazee et al., located primarily in San

Francisco and Los Angeles prisons, it would be valuable to have future study participants provide cultures of active abscesses (Frazee et al., 2005).

This study provides further evidence of the high prevalence of abscesses and self-treatment among IDUs. Self-treatment of wounds, if not adequately assessed among this population, could have detrimental and costly effects. More research in the area of self-care is necessary to develop strategies to address this current health problem.

Biographies

David S. Fink, MPH, is an epidemiologist for the Behavioral and Social Health Outcomes Program (BSHOP) in the United States Army Institute of Public Health. He has been involved in several mixed-methodology behavioral health studies in the United States Armed Forces. He received his Master's in Public Health in Epidemiology and Biostatistics from San Diego State University.

Suzanne P. Lindsay, Ph.D., MSW, MPH, is Associate Professor of Epidemiology and the Executive Director of the Institute for Public Health (IPH) in the Graduate School of Public Health at San Diego State University (http://iph.sdsu.edu). The mission of the IPH is to provide a bridge between the academic resources of San Diego State University and the public health practice community, with particular emphasis on the translation of evidence-based best practice into sustainable community programs that promote health. Within this community-based context, Dr Lindsay's primary area of research interest involves the study of interpersonal violence, including youth violence, homicide, suicide, family violence, spousal abuse, child abuse, and sexual assault. Dr Lindsay has also led numerous applied research projects in many different content areas in low-income communities vulnerable to the negative impact of social determinants of health, advocating for programs that promote community-based participatory research and collective impact. In addition, the IPH provides distance-learning opportunities in the form of website content development and Web-based training modules to provide easily accessible educational opportunities for clinical healthcare providers and the public health professional community.

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Alex H. Kral, Ph.D., is Director of the Urban Health Program at RTI International in San Francisco, CA. He has been conducting community-based research on illicit drug use and infectious diseases in urban poor populations for the past two decades.

Ricky N. Bluthenthal, Ph.D., is Professor in the Department of Preventive Medicine, Keck School of Medicine, University of Southern California. His previous research established the effectiveness of syringe exchange programs, documented how community conditions contribute to health disparities, and examined health policy implementation. He received his doctoral degree in Sociology from the University of California, Berkeley in 1998.

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TABLE 1

Demographic and injection characteristics of the survey population (N = 858), California, 2003–2005

Characteristic or practice	Sample with no recent abscess (n = 538)	Sample with recent abscess(es)[a] (n = 320)	P-value
Gender			0.0004
Male	406 (75.5)	206 (64.4)	
Female	131 (24.3)	114 (35.6)	
Race			0.91
Black	195 (36.2)	116 (37.2)	
White	116 (21.6)	66 (21.2)	
Latino	192 (35.7)	110 (35.3)	
Other	28 (5.2)	20 (6.4)	
Age			0.31
<30 years	27 (5.0)	15 (4.8)	
30–39 years	97 (18.0)	42 (13.3)	
40–49 years	194 (36.1)	124 (39.2)	
50+ years	216 (40.1)	135 (42.7)	
Education			0.46
≥ High school	326 (60.6)	186 (58.5)	
< High school	208 (38.7)	132 (41.5)	
Homeless			0.64
Yes	285 (53.0)	175 (55.6)	
No	244 (45.4)	140 (44.4)	
SEP client			0.90
Yes	367 (68.2)	220 (68.8)	
No	170 (31.6)	100 (31.3)	
Years of injecting			0.02
<10 years	90 (16.7)	36 (11.4)	
10–19 years	102 (19.0)	49 (15.5)	
20+ years	342 (63.6)	231 (73.1)	
Injection frequency			0.02
1–29 a month	115 (21.4)	48 (15.1)	
30–89 a month	170 (31.6)	95 (29.8)	
90+ a month	249 (46.3)	176 (55.2)	
Reused syringe in last 30 days			0.09
Yes	117 (21.7)	86 (26.8)	
No	420 (78.1)	234 (73.1)	
Type of drug injected			
Heroin	495 (92.0)	312 (97.5)	0.001
Cocaine (powder)	68 (12.6)	40 (12.5)	0.94
Cocaine (rock)	33 (6.1)	20 (6.3)	0.95

Characteristic or practice	Sample with no recent abscess (*n* = 538)	Sample with recent abscess(es)[a] (*n* = 320)	*P*-value
Methamphetamines	55 (10.2)	14 (4.4)	0.002
Speedball (heroin/cocaine)	123 (22.9)	88 (27.5)	0.13

[a]Those reporting an abscess in the prior 6 months.

TABLE 2

Bivariate association (Student *t*-test) between self-reported abscess in the prior 6 months and injection characteristics in 858 injection drug users, California, 2003–2005

Characteristic or practice	Sample with no recent abscess (*n* = 538) Mean (SD)	Sample with recent abscess(es)[a] (*n* = 320) Mean (SD)	*P*-value
Percentage of time the particpant cleaned skin prior to injection	46.2 (43.1)	39.7 (41.8)	0.03
Number of times the participant did skin-popping in past 30 days	11.4 (27.0)	40.1 (55.5)	< 0.001
Number of times the participant injected vein in past 30 days	74.1 (75.3)	60.5 (81.6)	0.01

[a]Those reporting an abscess in the prior 6 months.

SD, standard deviation.

TABLE 3

Multivariate logistic regression model of a self-reported abscess in the prior 6 months in 829 injection drug users, California, 2003–2005

	Adjusted odds ratio	95% CI
Age		
<30 years	1	–
30–39 years	0.74	(0.34–1.63)
40–49 years	1.05	(0.51–2.17)
50+ years	1.02	(0.49–2.14)
Race		
White	1	–
Black	0.95	(0.62–1.45)
Latino	0.87	(0.57–1.31)
Other	1.32	(0.66–2.64)
Gender		
Male	1	–
Female	1.42	(1.01–2.00)
SEP client		
No	1	–
Yes	0.91	(0.65–1.27)
10% increase in cleaning skin prior to injection*	0.96	(0.92–0.99)
Per 10 times skin-popping in past 30 days**	1.21	(1.20–1.21)

*When modeling percentage of time the participant cleanedskin prior to injection, we increased units to 10 to provide more meaningful comparisons. Example: instead of displaying a 1% increase in the percentage of time the participant cleaned skin, we reported per 10% increase in the proportion of time the participant cleaned skin.

**When modeling the number of times the participant did skin-popping in past 30 days, we increased units to 10 to provide a more meaningful increase in the described behavior.

TABLE 4

Self-reported treatment method of most recent lifetime abscess in 457 California injection drug users, California, 2003–2005

Means of abscess treatment	*n*	%
Treated by a medical professional	252	55.1
Self-treatment		
Lancing own abscess	143	31.3
Medication with nonprescribed antibiotics	22	4.8
Other homeopathic care*	40	8.8

*Examples of other homeopathic care include: salt-water soak, hot and cold compresses, and application of aloe or other moisturizers.

TABLE 5

Demographic and injection characteristics of 544 California injection drug users self-reporting treatment of previous lifetime abscess, California, 2003–2005

Characteristic or practice	Did not self-treat last abscess (*n* = 283)	Self-treated prior abscess (*n* = 261)	*P*-value
Age			0.21
<30 years	8 (2.9)	14 (5.4)	
30–39 years	41 (14.7)	33 (12.7)	
40–49 years	101 (36.2)	108 (41.5)	
50+ years	129 (46.2)	105 (40.4)	
Race			0.004
White	54 (19.4)	55 (21.5)	
Black	116 (41.6)	70 (27.3)	
Latino	92 (33.0)	116 (45.3)	
Other	17 (6.1)	15 (5.9)	
Gender			0.32
Male	203 (71.7)	177 (67.8)	
Female	80 (28.3)	84 (32.2)	
Homeless			0.67
No	128 (46.0)	114 (44.2)	
Yes	150 (54.0)	144 (55.8)	
SEP client			0.95
No	95 (33.6)	87 (33.3)	
Yes	188 (66.4)	174 (66.7)	
Years of injecting			0.43
<10 years	28 (10.0)	33 (12.7)	
10–19 years	52 (18.6)	40 (15.4)	
20+ years	199 (71.3)	187 (71.9)	
Injection frequency			0.01
1–29 a month	61 (21.7)	32 (12.3)	
30–89 a month	85 (30.3)	84 (32.2)	
90+ a month	135 (48.0)	145 (55.6)	
Medical care			0.0007
No usual place for care	80 (28.3)	110 (42.2)	
Have a usual place for care	203 (71.7)	151 (57.9)	
Usual place of care			< 0.0001
Private doctor’s office	12 (5.9)	24 (15.9)	
Community clinic	55 (27.1)	42 (27.8)	
Hospital outpatient clinic	60 (29.6)	24 (15.9)	
Emergency room	49 (24.1)	44 (29.1)	
Syringe exchange program	0(0.0)	4 (2.6)	

Characteristic or practice	Did not self-treat last abscess (*n* = 283)	Self-treated prior abscess (*n* = 261)	*P*-value
Other	23 (11.3)	19 (12.6)	
Refuse to answer	4 (2.0)	6 (4.0)	
Insurance			0.20
No insurance	161 (56.9)	162 (62.3)	
Insured	122 (43.1)	98 (37.7)	

TABLE 6

Multivariate logistic regression model of self-treatment of last lifetime abscess in 457 injection drug users, California, 2003–2005

	Adjusted odds ratio	95% CI
Age		
<30 years	1.00	–
30–39 years	0.91	(0.29–2.90)
40–49 years	1.31	(0.44–3.90)
50+ years	1.49	(0.49–4.56)
Race		
White	1	–
Black	0.60	(0.34–1.04)
Latino	1.57	(0.95–2.60)
Gender		
Male	1	–
Female	1.21	(0.79–1.85)
SEP client		
No	1	–
Yes	0.88	(0.58–1.32)
Insured		
No	1	–
Yes	0.93	(0.62–1.39)
Have usual place of care		
No	1	–
Yes	0.61	(0.40–0.92)
Contrast	Odds ratio	95% CI
Latino vs. Black	2.62	(1.66–4.13)