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“Shotgunning” in a Population of Patients with Severe Mental Illness and Comorbid Substance Use Disorders

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Abstract

“Shotgunning” refers to the practice of one individual forcibly exhaling smoke into the mouth of another, and may increase the risk of transmission of respiratory pathogens. The extent of shotgunning among individuals with co-occurring serious mental illness and substance use is unknown. We included questions about shotgunning in an interview of 236 participants of a study testing a model to prevent and treat HIV and hepatitis. Shotgunning was common (61% [145/236]) and correlated with increased substance use severity and several high-risk behaviors. Only 8% (11/145) understood that shotgunning could transmit disease. Further research and patient education on shotgunning is warranted.

INTRODUCTION

Smoking of illicit drugs has been associated with the transmission of respiratory pathogens including bacterial pneumonia and tuberculosis.^{1–7} Although this association has multiple causes,^{8–17} the practice of “shotgunning” may contribute. “Shotgunning” or “doing a shotgun” refers to the practice of one individual forcibly exhaling (blowing) smoke into the mouth (or, rarely, nose) of another. The term may have originated from the practice of using an actual shotgun to smoke illicit drugs during the Vietnam War. Currently, this practice is more commonly performed by one individual drawing smoke into his or her mouth, holding it there temporarily and exhaling it directly into another individual’s mouth (either with the lips of the individuals touching directly or with one or both individuals using their fingers to form a “tube” around the blunt connecting their mouths) or by the placing of the cigarette, joint, blunt, or pipe directly into the individual’s mouth before exhaling.^{18–20}

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Declaration of Interest

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

Shotgunning currently seems to be performed for a mixture of practical and other reasons including to increase the subjectively experienced “high” as the smoke is forced into the recipient’s lungs, to try to “conserve” smoke, to “share” with another individual in a controlled manner, to lessen the “harshness” of the smoke (when previously inhaled smoke is blown into another’s mouth), as an adjunct to intimate behavior, and as a novelty in social interactions.²⁰

Shotgunning has been associated with potential increased transmission of respiratory pathogens, including tuberculosis, as well as high-risk sex practices. Shotgunning of crack cocaine has also been associated with a retropharyngeal abscess which may result from increased intraoral pressure and a microperforation of the pharyngeal mucosa with subsequent introduction of air and oral bacteria into the retropharyngeal space.²¹ Several case reports have suggested a link between shotgunning (or sharing of a water pipe) and tuberculosis transmission.^{4,5,7} Perlman et al.^{19,20} interviewed 354 drug users who were participants at New York City syringe exchange or inpatient detoxification programs and found that 17% of the participants reported shotgunning in the prior 6 months. Shotgunning was associated with the use of crack cocaine and having engaged in high-risk sexual behaviors.¹⁹ In another study involving needle exchange participants in Baltimore, Riley et al. also found an association of shotgunning with positive purified protein derivative tuberculin skin test (PPD) results.²²

Individuals with serious mental illness (SMI) may be more likely to engage in high-risk sexual behaviors and have been shown to be at significantly increased risk for human immunodeficiency virus (HIV) and Hepatitis C virus (HCV) infection due in large part to co-occurring use of substances and elevated rates of high-risk drug related behaviors. Rosenberg et al.²³ found an HIV prevalence of 3.1% (approximately 9 times the overall U.S. rate) and HCV prevalence of 19.6% (approximately 11 times the overall U.S. rate) in individuals with severe mental illness. Little is known about the rates of shotgunning in this population. The possible association of shotgunning with transmission of respiratory illness could incur a large risk to public health and also be especially devastating for individuals with SMI, 70–80% of whom also smoke cigarettes.²⁴

We aimed to (1) describe the prevalence and practices of shotgunning among individuals having a current diagnosis of SMI and a current or lifetime diagnoses of a substance use disorder; (2) assess what clinical, demographic, and behavioral factors correlate with shotgunning; and (3) assess the risk of infectious disease among individuals who have a history of shotgunning.

METHODS

We recruited 236 clients dually diagnosed with SMI and co-occurring substance use disorders and receiving services at one of four community mental health programs in Baltimore between 2006 and 2008. Individuals enrolled in a randomized study designed to evaluate an integrated service model for needed HIV and hepatitis infectious diseases treatment. Data reported here are from the baseline assessment. After providing informed consent, each participant completed a baseline assessment covering: demographics;

knowledge, attitudes, and risk behaviors for blood-borne infections; substance use; and health status (including tuberculosis).²⁵ The study was approved by the Institutional Review Boards of Dartmouth and the University of Maryland and relevant boards associated with clinical sites.

Participants

Participants were between the ages of 18 years and 65 years, and had schizophrenic spectrum, major depressive, or bipolar disorder. All participants had current or lifetime diagnoses of substance use disorder, were English speaking, and able to give informed consent. The study was offered to patients who met eligibility according to their treatment team; a total of 76.4% (240/314) consented to participate. Consenters did not differ from refusers on diagnosis, ethnicity, gender, and age. A majority of the sample was African American and 38% were women (Table 1).

Measures

Individuals who reported having ever heard of “shotgunning” were asked an additional 16 questions specific to shotgunning. Questions included whether the participant had ever participated in some form of shotgunning and whether they had engaged in shotgunning in the past 6 months. The AIDS Risk Inventory (Modified) (ARI) is a structured interview for assessing knowledge, attitudes, and risk behaviors associated with acquiring and transmitting blood-borne infections. Specific items on hepatitis were added. Previous studies using the ARI with SMI respondents found that it is reliable and valid.^{26–28} The Dartmouth Assessment of Lifestyle Instrument (DALI) is an 18-item questionnaire which contains two scales: current alcohol and drug use disorders in people with SMI.²⁹ The SF-12 Health Survey is a 12-item survey assessing physical and mental health. It is reliable and valid in general medical populations and has been used extensively in studies of persons with severe mental illness.

Statistical Analysis

Frequencies were calculated to describe the shotgunning behaviors of the sample. A dichotomous variable was created from the question asking if subjects had ever shotgunned. *t*-tests and chi-square tests (fisher exact tests for HIV) were used to compare the participants who had and had not ever shotgunned on demographic factors (age, gender, and race), clinical status (diagnosis, substance abuse, infectious disease including Hepatitis C and B, HIV, and TB), and other high-risk behaviors.

RESULTS

Virtually all participants (99% [233/236]) reported that they had ever smoked drugs including tobacco (91% [215/236]), marijuana (87% [205/236]), cocaine (52% [121/236]), PCP (18% [41/236]), methamphetamine (9% [21/236]), and heroin (5% [11/236]). The majority (77% [181/236]) also reported that they had ever shared a cigarette, pipe, blunt or, joint. About half (45% [102/236]) reported having done so within 6 months.

Most participants (81% [189/236]) said that they had ever heard of “shotgunning” with 61% (145/236) saying that they had ever shotgunned themselves. A minority of those who reported ever shotgunning (9% [13/145]) had done so within 6 months. Crack and marijuana were the common drugs that individuals were currently shotgunning (7 of 13 in each case). The average age of first shotgunning was 19.7 (SD 7.91; range 9–55 years). The majority (73.1% [106/145]) reported learning to shotgun from a friend. Less than 10% learned from primary sexual partner, casual sexual partner, sibling, and prostitute. Most participants who had shotgunned said that they typically both give and receive smoke (69% [100/145]) whereas 26.2% (38/145) said they only receive and 4.8% (7/145) said they only give.

The most common reasons for shotgunning included to increase the intensity of the “high” (62.8% [91/145]), as part of a social activity (48.6% [70/145]), as a means to conserve smoke (33% [48/145]), and as part of intimacy with a sexual partner (16.6% [24/145]). The most common primary reason for shotgunning was for a more intense high (49% [69/145]). Only 8% (11/145) said that they thought that they could catch or transmit a disease by shotgunning.

Correlates of Shotgunning

Table 1 shows African Americans were more likely than Caucasians to have a history of shotgunning. Shotgunning was also significantly correlated with high-risk behaviors including ever injecting drugs, sharing needles, having unprotected sex in exchange for drugs, and reporting a sexually transmitted disease. Clinically, shotgunning was associated with increased DALI scores but not with health status measures HIV, Hepatitis C, tuberculosis, or history of positive PPD.

DISCUSSION

Our study is the first to report on shotgunning among individuals with SMI. We found that over 60% of our sample of individuals with a lifetime substance abuse history had engaged in shotgunning. This high rate coupled with the minimal knowledge regarding shotgunning observed among the SMI group is alarming given the potential health consequences of shotgunning. On the other hand, only 6% of this sample reported shotgunning within the past 6 months. This is somewhat lower than the prevalence of recent shotgunning (17%) observed in a previous study conducted in New York City over 10 years ago that focused on a somewhat younger general population of patients with current substance use disorders.^{19,20}

The association of shotgunning with other high-risk behaviors as well as increased severity of substance use underscores the need to monitor and educate individuals with SMI and co-occurring substance use about the potential increased health risks of shotgunning. Although the study had several limitations including its cross-sectional nature, reliance on self-report, and our inability to confirm participants' PPD status, the potential for shotgunning to increase the risk of transmission of respiratory pathogens as well as possible association with sexually transmitted diseases highlights the need for better understanding of shotgunning in different populations.

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TABLE 1

Comparison of participants with and without history of shotgunning

Variable	Total (N = 236)			No (N = 91)			Yes (N = 145)			Comparison		
	n	%		n	%		n	%		Test	df	Test value p value
Age	Mean	46.48 ± 8.91		47.28 ± 8.8			45.99 ± 8.97			t	233	1.08 .281
DALI alcohol score	Mean	-.45 ± 1.71		-.79 ± 1.74			-.24 ± 1.66			t	234	-2.44 .015
DALI drug score	Mean	-1.17 ± 1.12		-1.53 ± .94			-.95 ± 1.17			t	219	-3.99 <.0001
SF-12 physical component normative score	Mean	47.93 ± 10.30		47.57 ± 10.34			48.15 ± 10.30			t	233	-.42 .674
SF-12 mental component normative score	Mean	43.13 ± 12.55		44.41 ± 12.62			42.34 ± 12.48			t	233	1.23 .220
Gender	Female	90	38.1%	36	39.6%		54	37.2%		Chi-square	1	.13 .721
	Male	146	61.9%	55	60.4%		91	62.8%				
Race	White	65	27.5%	36	39.6%		29	20.0%		Chi-square	1	10.72 .001
	Black	171	72.5%	55	60.4%		116	80.0%				
Psychiatric diagnosis	Major depression	31	13.1%	9	9.9%		22	15.2%		Chi-square	3	1.70 .636
	Bipolar disorder	40	16.9%	17	18.7%		23	15.9%				
	Schizoaffective DO	55	23.3%	23	25.3%		32	22.1%				
	Schizophrenia	110	46.6%	42	46.2%		68	46.9%				
HCV infection status (self report)	Yes	26	25.5%	9	22.0%		17	27.9%		Chi-square	1	.45 .501
	No	76	74.5%	32	78.0%		44	72.1%				
HIV infection status (self report)	Yes	8	7.9%	3	7.3%		5	8.3%		Fisher		1.000
	No	93	92.1%	38	92.7%		55	91.7%				
“Ever shot up drugs?”	Yes	64	27.1%	16	17.6%		48	33.1%		Chi-square	1	6.8 .009
	No	172	72.9%	75	82.4%		97	66.9%				
“Ever used cocaine through nose?”	Yes	110	46.6%	30	33.0%		80	55.2%		Chi-square	1	11.08 .001
	No	126	53.4%	61	67.0%		65	44.8%				
“Ever smoked cocaine?”	Yes	78	33.1%	20	22.0%		58	40.0%		Chi-square	1	8.2 .004
	No	158	66.9%	71	78.0%		87	60.0%				
“Ever had an STD?”	Yes	103	44.0%	28	31.5%		75	51.7%		Chi-square	1	9.19 .002
	No	131	56.0%	61	68.5%		70	48.3%				
“Ever shared needles?”	Yes	43	18.3%	8	8.9%		35	24.1%		Chi-square	1	8.64 .003
	No	192	81.7%	82	91.1%		110	75.9%				

Variable	Total (N = 236)			No (N = 91)			Yes (N = 145)			Comparison			
	n	%		n	%		n	%		Test	df	Test value	p value
“Ever sniffed/snorted drugs?”	113	47.9%	Yes	30	33.0%		83	57.2%		Chi-square	1	13.20	<.001
	123	52.1%	No	61	67.0%		62	42.8%					
	36	15.3%	5 times	12	13.2%		24	16.7%		Chi-square	2	2.35	.309
“Had unprotected sex in last 6 months?”	34	14.5%	1–5 times	10	11.0%		24	16.7%					
	165	70.2%	Never	69	75.8%		96	66.7%					
	34	16.4%	Yes	4	5.6%		30	22.2%		Chi-square	1	9.50	.002
“Had unprotected sex in exchange for drugs?”	173	83.6%	No	68	94.4%		105	77.8%					