



Rethinking HIV Risks among Women on the US/Mexico Border: Alcohol and Latina Sex Behavior

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Abstract

Background: For HIV(-) women, unprotected, sexual activity with an HIV(+) male is the leading route of HIV transmission. The extent to which Hispanic female (Latina) emergency department (ED) patients participate in sexual activity with risk for HIV has not been well described. To design preventive interventions to decrease HIV transmission to women, more information about their sexual risk behavior is needed.

Methods: Adult, sexually active, female ED patients were surveyed on HIV risk factors including questions on sexual behaviors and alcohol use. The Questionnaire included RAPS4 (a screen for alcohol dependency) and the NIAAA quantity and frequency drinking questions. Multivariable linear regression analyses were performed to assess the associations between HIV sex risk behaviors and drinking and other factors.

Results: 56 women completed surveys with an average age of 34, 71.4% were single. Positive RAPS4 was found to be one of three independent factors associated with HIV sex risk behavior (OR = 16.6, p = 0.012). The other two associated factors were being single (OR = 19.7, p = 0.020) and being unemployed (OR = 0.1, p = 0.023). When those who screened RAPS4 positive were compared to those screening negative, 77% vs. 40% (OR = 4.95, p = 0.039) reported HIV sex risk behavior and 92.3% vs. 34.9% (OR = 19.74, p = 0.001) reported sex after alcohol or drug use. However equal numbers in both groups reported no concern about their risk for HIV (53.9% vs. 44.2%, OR = 0.078, p = 0.94), and not always using condoms (69.2% vs. 83.7%, OR = 3.12 p = 0.258).

Conclusion: Most young Latina ED patients were unconcerned about risk of HIV infection in spite of their reports of HIV sex risk behavior. Latinas who were RAPS4 positive were more likely to report HIV sex risk behavior, but they had no greater concern about their HIV risk and no greater use of condoms. Preventive interventions should be developed to decrease alcohol use and to increase concern about HIV risk among Latinas.

rate of new HIV infections among Latinas is 4.2 times higher than that of white females [1]. Understanding HIV risk behaviors within the Hispanic female population could be of value to limit HIV transmission. For Latinas, unsafe sexual behavior with an HIV infected male is the primary route of HIV acquisition [1]. HIV positive males may not be aware of their HIV status or even if they are aware, more than 13% report unprotected sex with women [2]. According to the CDC 1 in 8 HIV infected individuals are unaware they are infected [3]. Greater knowledge of Latinas' sex behaviors and associated risk factors is needed to inform preventive efforts.

Little is known about HIV sex risk behaviors among women Emergency Department (ED) patients. Factors that can greatly influence sexual behavior such as age, ethnic, racial and cultural background varies considerably by ED location. A review of literature on prevalence of HIV among ED patients demonstrates that ED patients can have a relatively high prevalence, up to >1% [4-10]. A substantial proportion of ED patients report engaging in HIV sex risk behaviors. In a Boston ED, 70% of substance users reported engaging in sex without a condom in the past 30 days, and 36% reported having sex without a condom with a casual sex partner [11]. In a New York ED, 37.6% of patients reported engaging in one or more HIV risk behaviors and among participants who reported only one sexual partner, a seemingly "low risk" population, 15.0% of women reported that their usual sexual partner had other concurrent partners in the past year [12]. In another ED, 50.2% of women reported having unprotected vaginal or anal sex and 4.3% of women reported having unprotected sex with men who had sex with another man in the past ten years [13].

To date no studies have surveyed unsafe, sexual activity among Latina ED patients. Among Latinas, immigrants may be even less enabled to protect themselves due to their lack of empowerment within machismo cultures [14]. El Paso is a major city on the US/Mexico border. El Paso's population is 80.7% Hispanic with many new and recent immigrants primarily of Mexican origin [15]. In El Paso, the HIV diagnosis rate for Latinas was 7.4/100,000 in 2013,

Introduction

In the US, Hispanic females (Latinas) continue to be disproportionately affected by HIV infection [1]. The estimated

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ranking 9th out of the 105 US metropolitan areas surveyed by the CDC [1].

While Mexico reports a low national HIV prevalence rate [16], the highly mobile border population is at risk of HIV infection secondary to poverty, lack of access to health services, and increased risk-taking behavior [17,18]. Identifying women at risk for HIV infection due to their participation in HIV sex risk behaviors and determining the factors associated with such behavior could inform future preventive efforts which, if effective, could reduce HIV acquisition rates among Latinas. This study was designed to examine HIV sex risk behaviors among Latina patients at an urban ED on the US/Mexico border and to determine factors that are associated with those behaviors.

Methods

Study Design

We conducted a survey of a convenience sample of sexually active Latina patients in an urban, academic, trauma center ED with 54,000 patient visits per year. This study was approved by the university's institutional review board and all participants completed informed consent.

Study setting and patient recruitment

Medical students approached all available female patients 18 - 64 years of age who presented for treatment in the ED, 4 - 9 PM June 23 August 25, 2010. Patients were excluded if they were prisoners or too ill, violent or psychotic. Students were trained to administer survey questionnaires and to follow a standardized study protocol. Practice sessions were conducted with roll play focused on correct delivery of the questionnaire, which includes sensitive topics: sexual behavior, alcohol and drug use. Students demonstrated proficiency in survey administration prior to participant interviews. Students were blinded to this study's hypothesis. Answers to questionnaires were obtained during 40 minute interviews in English or Spanish.

Only sexually active women were eligible, however all women screened reported sexual activity in the past 10 years. An eligibility question was embedded within a general health questionnaire, which has been used in prior studies yielding accurate responses to sensitive questions [19].

Survey questionnaire and data

The HIV Sex Risk survey is a composite derived from four previously published HIV risk surveys [20-23] and modified to include questions relevant to women and to make questions explicit. This novel instrument developed by the principal investigator is an extensive 79 question survey concerning the woman and her partners' sexual behaviors, perception of HIV risk, sexually transmitted infection, alcohol use, and drug use.

Surveys were completed by students first on paper and subsequently entered into a database independently by two students (double data entry). Few discrepancies between the two entries were encountered and those that were found were easily resolved by reviewing the original paper surveys and querying students involved.

Variables

The variables used in the study were either continuous or dichotomous scale. Age was a continuous variable. Dichotomous scale variables were marital status, preferred language, country of origin, parent's country of origin, years of education, and employment. Responses from the HIV Sex Risk assessment survey were dichotomized. For example, the response to the question "On a scale of 0 - 9 what level of concern do you have about your HIV risk?" was categorized as 0 or greater than zero. The response to "In the past year how often have you used condoms when you have sex?" was dichotomized (always or not always). Other responses to questions on the survey were treated as dichotomous variables as well, including: sexual encounter under influence of drug, alcohol or both (never or not never), number of sexual partners per month in the previous year

(0 and 1 or more), sexually transmitted infection (0 and 1 or more), injection drug use (yes or no).

Drinking variables included the Rapid Alcohol Problems Screen 4 (RAPS4) and the NIAAA quantity and frequency questions. RAPS4 is a brief screening tool with 4 items, each scored yes or no. A positive answer to at least 1 item suggests harmful drinking, alcohol dependency or alcohol use disorder. The reliability and validity of this instrument among African Americans and Latinos is well established [24]. 'At risk' drinking was identified when the participant reported drinking above NIAAA guidelines for safe drinking for females (8 or more drinks per week or binge drinking, 4 or more drinks per occasion (binge drinking) [25]. Binge drinking was also used as a variable.

For sexually transmitted infection (STI), the following question was used to create a dichotomized (no to all vs. any positive) variable: "To the best of your knowledge, do you now have or have you ever had any of the following; Gonorrhea, Chlamydia, Syphilis, Herpes, Viral Hepatitis, and Anal/Genital Warts, or HPV?"

The primary HIV sex risk behavior, having had anal, vaginal or oral intercourse without a condom in the past 10 years, was dichotomous, with a yes or no response. Responses to other questions concerning HIV sex risk behaviors were summed within three categories (sexual encounter with high risk persons or situations, sexual encounter in risky locations and sex after alcohol or drug). The total sum of these other categories was treated as a dichotomized composite outcome variable (any positive response to any question or no positive response). The following questions were combined to create sexual encounter with high risk persons and/or situations: "In the last 10 years how often have you had... one night stands, group sex, sex with sex workers, sex you 'bought' for money, drugs or other, sex multiple times with two or more sexual partners, one-time or anonymous 'tricks'?" "In the past 6 months how many times did you trade sex: for money, drugs or anything else (for example, cigarettes, or a place to stay)?" For sexual encounter in risky locations, a positive response was answering yes to any of the following: "...sexual encounters or contacts in the last 10 years: outside or inside shooting galleries (places of intravenous drug use), (adult) bookstores, parties, massage parlors, rooms rented for sex, public restrooms, or autos." The following questions were combined to create sexual encounter under the influence of drug and/or alcohol: "In the past year how many times did you have sex after drinking any alcohol?", "In the past year how many times did you have sex after using drugs?", "In the past year have you had sex under the influence of alcohol?", "In the past year have you had sex under the influence of drugs?"

Data analysis

Descriptive statistics for all continuous variables are presented as means and standard deviations. Discrete variables are presented as frequencies and proportions. The outcome variables of interest in this study are unprotected sexual intercourse and HIV sex risk behavior, defined as (yes) or (no). Treating these as a single combined outcome variable resulted in no significant associations with exposure variables.

Exposure variables of interest in this study are listed in table 1. All observations were dropped from analyses except as noted in table 2 when missing values were dropped from analyses in order to provide accurate results. The association between outcome variable of interest and exposure variables were measured and tested using a two-sample t-test for the comparison of two means or Fisher's exact test for the comparison of multiple proportions. A secondary analysis was performed on each significant summary exposure variable to estimate a measure of association for each variable separately (unadjusted model) and for associations adjusted for all other variables considered (adjusted model).

Specifically, we utilized multiple variable logistic regression models to identify the magnitude of an association (i.e. odds ratios) and the magnitude of inferential impact (i.e. p-values) for each exposure variable, adjusted for the possible confounding effects of the other exposures. Variables were kept in the model if their coefficient

Table 1: Description of demographic and general health variables by HIV sex risk behavior and unprotected sex

Variable	Total (n = 56)		HIV Sex Risk Behavior		p-value	Unprotected sex		p-value
	n	%	No (n = 29) %	Yes (n = 27) %		No (n = 20) %	Yes (n = 36) %	
Age (mean, SD)	33.54	10.85	35.6 (11.6)	31.4 (9.8)	0.1512	34.4 (11.7)	33.1 (10.5)	0.6794
Country of origin					0.1256			0.5614
USA	45	80.36	72.41	88.89		75	83.33	
Mexico	9	16.07	24.14	7.41		20	13.89	
Germany	1	1.79	3.45	0		5	0	
Missing	1	1.79	0	3.7		0	2.78	
Parents COO					0.0987			0.5499
USA	20	35.71	44.83	25.93		45	30.56	
Mexico	22	39.29	41.38	37.04		40	38.89	
US and Mexico	11	19.64	10.34	29.63		10	25	
Mexico and unknown	1	1.79	3.45	0		0	2.78	
Missing	2	3.57	0	7.41		5	2.78	
Preferred language					0.943			0.2126
English	44	78.57	79.31	77.78		85	75	
Spanish	5	8.93	10.34	7.41		0	13.89	
English/Spanish	6	10.71	10.34	11.11		10	11.11	
Missing	1	1.79	0	3.7		5	0	
Marital status					0.2078			0.5749
Single	32	57.14	48.28	66.67		60	55.56	
Married	14	25	34.48	14.81		15	30.56	
Separated	2	3.57	0	7.41		5	2.78	
Divorced	6	10.71	13.79	7.41		15	8.33	
Missing	2	3.57	3.45	3.7		5	2.78	
Single					0.204			0.4159
No	14	25	34.48	14.81		15	30.56	
Yes	40	71.43	62.07	81.48		80	66.67	
Missing	2	3.57	3.45	3.7		5	2.78	
Employment status					0.0628			0.542
Employed	19	33.93	24.14	44.44		25	38.89	
Unemployed	18	32.14	48.28	14.81		30	33.33	
Student	7	12.5	10.34	14.81		20	8.33	
Homemaker	11	19.64	17.24	22.22		25	16.67	
Missing	1	1.79	0	3.7		0	2.78	
More than 12 years of education					0.1784			0.5327
No	25	44.64	34.48	55.56		45	44.44	
Yes	30	53.57	62.07	44.44		50	55.56	
Missing	1	1.79	3.45	0		5	0	
Smoking					0.8836			0.0521
No	37	66.07	68.97	62.96		85	55.56	
Yes	18	32.14	31.03	33.33		15	41.67	
Missing	1	1.79	0	3.7		0	2.78	
STI					0.0266			1
No	43	76.79	89.66	62.96		75	77.78	
Yes	13	23.21	10.34	37.04		25	22.22	
Weekly alcohol misuse					0.1136			0.718
No	41	73.21	72.41	74.07		70	75	
Yes	11	19.64	13.79	25.93		25	16.67	
Missing	4	7.14	13.79	0		5	8.33	
Binge					0.372			1
No	31	55.36	58.62	51.85		55	55.56	
Yes	23	41.07	34.48	48.15		40	41.67	
Missing	2	3.57	6.9	0		5	2.78	
Weekly & binge					0.4157			0.5104
No	33	58.93	65.52	51.85		70	80.56	
Yes	23	41.07	34.48	48.15		30	19.44	
RAPS4					0.0266			1
Negative	43	76.79	89.66	62.96		60	58.33	
Positive	13	23.21	10.34	37.04		40	41.67	

specific p-value was less than 0.05. Microsoft Excel and SAS statistical software (v 9.3) were used for data management and analysis [26].

Results

There were 70 females who signed consent and 5 females who stopped before finishing the survey. Among the 65 patients who finished the survey, we report results for the Latina cohort, 56 patients.

Due to the sensitive nature of the questions, participants were allowed to not answer some questions and continue to finish the survey; hence not all answers to all questions were available from those finishing the survey. Only one patient reported intravenous drug use and no patient self-reported being HIV positive.

Table 1 presents descriptive statistics of clinical and demographic characteristics for all participants. This data is stratified by HIV sex

risk behavior (yes/no) and unprotected sex (yes/no). The average age of the participants was 33.5 (SD = 10.9). Most (64%) reported unprotected sex. Almost half (48%) answered 'yes' to at least one of the HIV sex risk behavior questions. Over 79% were English speaking. Most were born in the USA (80.4%) with about half having at least one parent born in Mexico. About half had a high school education or greater (54%). Only 34% of the participants were employed.

Smoking is the only characteristic that was significantly different between participants who reported unprotected sex and those that did not ($p = 0.052$). The characteristics that were significantly associated with HIV sex risk behavior were history of past sexually transmitted infection (STI) ($p = 0.027$), and positive RAPS4 ($p = 0.027$). Employment status was borderline significant ($p = 0.063$).

Table 2 presents the regression analysis of selected variables associated with HIV sex risk behavior. In the multi-variable analysis, variables independently associated with HIV sex risk behavior were being single (OR 19.7, $p = 0.02$), positive RAPS4 (OR 16.6, $p = 0.012$) and being unemployed (OR = 0.1, $p = 0.023$). When this regression was repeated excluding married participants, the strong association of RAPS4 with HIV sex risk behavior remained.

Table 3 presents HIV risk perception, unprotected sex and individual HIV sex risk behavior variables by RAPS4 status. Comparing to patients with negative RAPS4, patients with positive RAPS4 were more likely to report sexual encounters with high risk persons and/or in high risk situations (61.5% vs. 20.9%, OR = 5.6, $p = 0.02$), to report sexual encounters in risky locations (69.2% vs. 30.2%, OR = 5.0, $p = 0.029$), and to report sex after alcohol or drug use (92.3%

vs. 34.9%, OR = 19.7, $p = 0.001$). There is no significant difference in terms of perception of HIV between the RAPS4 positive and negative cohort. Almost half of the participants in both the RAPS4 positive and negative groups perceived themselves to have zero HIV risk no change respectively ($p=0.937$). Unprotected sex was common among both RAPS4 positives and negatives (53.9% and 67.4%, $p = 0.564$).

Discussion

We found HIV sex risk behavior among female ED patients to be positively associated with being unmarried and positive RAPS4, and negatively associated with unemployment. Our findings are consistent with other HIV sex risk behavior studies [27], but ours is the first to look at a group of Latinas in the ED. These women were for the most part young, single and educated. While many reported unprotected sexual intercourse (64%) and other HIV sex risk behavior (48%), half (46%) had no concern about their HIV risk and few (16%) reported always using condoms. Given their participation in unprotected intercourse and other HIV sex risk behavior, this lack of concern about HIV risk and lack of condom use is disconcerting. Of the three associations we found linked to HIV sex risk behavior, RAPS4 positivity may be amenable to modification.

Alcohol use has been linked to sexual risk [28-34] and unsafe sexual practices, including inconsistent condom use [35-38] and multiple sexual partners [39]. In a large-scale, cross-sectional study, alcohol misusers were 1.77 times more likely to engage in HIV sex risk behaviors such as exchange of sex for money or drugs and anal sex without condoms [40]. In a review of research conducted in eight countries, alcohol use was considered a facilitator of sexual

Table 2: Regression analysis of "HIV Sex Risk Behavior" on patients with complete data on "age", "single", "employment status", and "STI" (n = 53).

Variable	Univariate analysis				Multiple variable analysis		
	OR	95% CI	P-value		OR	95% CI	P-value
Age	0.95	(0.90,1.00)	0.0585		0.95	(0.88, 1.03)	0.2437
Country of origin							
Other	1						
US	3.58	(0.59,39.19)	0.222				
Parent COO							
US	1						
Mexico	1.28	(0.30,5.55)	0.9495				
Other	2.89	(0.51,18.91)	0.2997				
Single							
No	1						
Yes	3.97	(0.85,25.83)	0.089		19.7	(1.35, >999)	0.0199
Employment status							
Employed	1						
Unemployed	0.21	(0.03,1.03)	0.0552		0.1	(0.006, 0.78)	0.0226
Student	0.85	(0.11,7.67)	1		1.43	(0.08, 31.53)	1
Homemaker	0.77	(0.13,4.57)	1		0.3	(0.014, 4.07)	0.5609
More than 12 years of education							
No	1						
Yes	0.47	(0.13,1.60)	0.2748				
Smoking							
No	1						
Yes	1.05	(0.28,3.93)	1				
STI							
No	1						
Yes	5.37	(1.14,35.23)	0.0298		5.1	(0.77, 60.33)	0.1093
Weekly alcohol misuse							
No	1						
Yes	1.92	(0.41,10.50)	0.5453				
Binge							
No	1						
Yes	1.72	(0.49,6.26)	0.4929				
Weekly & binge							
No	1						
Yes	1.92	(0.56,6.9)	0.3699				
RAPS4							
Negative	1						
Positive	8.32	(1.49,88.01)	0.0102		16.6	(1.55, 949.0)	0.0122

Table 3: HIV sex risk attitudes and behaviors by RAPS4 status

	RAPS4		Unadjusted Model
	Negative (n = 43)	Positive (n = 13)	OR (p-value)
Risky behavior variable	%	%	
Perceived HIV risk			
Low	44.19	53.85	1
High	48.84	46.15	0.78 (0.937)
Missing	6.98	0	
Sexual encounter with high risk persons/situations ⁺			
Low risk	76.74	38.46	1
High risk	20.93	61.54	5.64 (0.020)
Missing	2.33	0	
Sexual encounter in risky locations ^{**}			
No	69.77	30.77	1
Yes	30.23	69.23	5.02 (0.029)
Sex encounter influenced by drug/alcohol ^{***}			
No	60.47	7.69	1
Yes	34.88	92.31	19.74 (0.001)
Missing	4.65	0	
Single Sexual Partner in the previous year			
Single partner	79.07	84.62	1
Multiple partner	13.95	15.38	1.03 (1.000)
Missing	6.98	0	
Unprotected sex			
No	32.56	46.15	1
Yes	67.44	53.85	0.57(0.564)
Always Use Condoms			
No	83.72	69.23	1
Yes	11.63	30.77	3.12(0.258)
Missing	4.65	0	

⁺ For sexual encounter with high risk persons and / or situations; yes was recorded for persons answered yes to any of the below:

- In the last 10 years how often have you had "One night stands"?
- In the last 10-years how often have you had group sex?
- In the last 10-years how often have you had sex with sex workers of sex you 'bought' with money, drugs or other?
- In the last 10-years how often have you had sex multiple times with two or more sexual partners?
- In the last 10-years how often have you had one-time or anonymous "tricks"?
- In the past 6 months how many times did you trade sex: For money, for drugs, for anything else (for example, cigarettes, and a place to stay)

^{**} For sexual encounter in risky locations; yes was recorded for persons answered yes to any of the below:

- Check the sites where you had sexual encounters or contacts in the last 10 years:
- Outside or inside shooting galleries
- Bookstores
- Parties
- Massage parlors
- Rooms rented for sex
- Public restrooms
- Autos

^{***} For Sexual encounter under influence of drug and/or alcohol; yes was recorded for persons answered yes to any of the below:

- In the past year how many times did you have sex after drinking any alcohol?
- In the past year how many times did you have sex after using drugs?
- In the past year have you had sex under the influence of alcohol?

In the past year have you had sex under the influence of drugs?

risky behaviors, such as inconsistent condom use and multiple sexual partners [41]. Alcohol misuse has also been shown to be related to HIV acquisition. In a meta-analysis assessing the relationship between alcohol misuse (greater than three drinks per occasion) and HIV infection, misusers had a 70% higher risk for acquiring or

having HIV than non-drinkers [42]. In one study, the incidence of HIV among women who consumed alcohol before sex was increased (RR 1.40 (CI 1.02 - 1.92) and when both the woman and her partner consumed alcohol, the increase was even greater (RR 1.81 (CI 1.34 - 2.45) [43]. Recently Monti reported that 6.8% of ED patients who reported binge drinking had sex without a condom and 5.4% of ED patients who were alcohol misusers reported having sex after alcohol in the 3 months prior to their ED visit [44].

We found RAPS4 positivity to be associated with HIV sex risk behavior, while drinking 'at risk' and binge drinking were not found to be associated. Generally, a positive RAPS4 reflects alcohol dependency and screens for alcohol use disorder, which are expected to be associated with chronic health and social problems. Two studies have reported increased unprotected sexual behavior among those who screen RAPS4 positive [45,46]. However, one study reported that among ED patients who were predominantly Latino or African American, heavy drinking prior to sex and not RAPS4 positivity was associated with multiple sexual partners and hence increased HIV risk [47].

Some explain the link between alcohol and HIV risk sexual behavior by suggesting that alcohol reduces cognition and enhances response to cues such as intimacy and immediate pleasure [48]. In their view intoxication leads to a diminution of the capacity to appropriately process risk. Thus intoxication would be expected as the important determinant of risky sexual behavior [49]. Lack of an association of binge drinking with HIV sex risk behavior in our data challenges this view. Our data show an association between RAPS4 positivity (alcohol dependency) and HIV sex risk behavior. Further study is needed to explore the complexity of the link between alcohol and sexual behavior, which may not be completely explained by reduced cognition. Perhaps HIV sex risk behavior is also an item on the list of social and health problems associated with alcohol dependency and needs recognition and evaluation in the context of alcohol dependency.

There was no significant difference in concern about HIV infection or in condom use between the RAPS4 positive and negative cohorts. RAPS4 positives reported more risky sexual practices and more often having sex in risky places. This may suggest a lack of education about the risk of HIV acquisition, the protective effects of condoms or the disinhibition caused by alcohol. There may be other cultural issues affecting perceptions of risk, or a culturally based lack of female empowerment to choose safer sexual practices. Preventive brief interventions should focus on raising HIV awareness while promoting condom use. Enabling discussions of the partner's HIV status and HIV sex risk behaviors may be a key component of these interventions.

Traditional Mexican culture may make it very difficult for women and wives to talk to their companion about condom use or discuss HIV. In traditional Mexican origin families, if the wife asks about condom use it can be considered an accusation of infidelity and the wife risks victimization and domestic violence [14]. In our survey, 36% never asked their sexual partner about their HIV status and never negotiated condom use with their sexual partner. While 47% reported always negotiating condom use, only 17% always used condoms.

Routine HIV screening has been introduced in some US EDs with variable success; screening rates have been reported as high as 91% [50]. Higher ED HIV screening rates have been associated with patient perceptions of a higher risk for acquiring HIV [51,52]. One of the most common reasons for declining HIV screening is a lack of perception of risk for HIV infection [53-57]. Our Latina study patients demonstrate this lack of perception of HIV risk. Hence similar to their lack of condom use, they may not participate in recommended HIV screening. Our findings suggest that a positive RAPS4 screen may be a risk factor for HIV transmission among Latinas who are sexually active and heterosexual.

This has implications for HIV screening in the ED. While routine

non-targeted opt-out HIV screening is a CDC recommendation [58], implementation has been slow. New risk stratification criteria for ED specific populations have been advocated and are under development to provide targeted HIV screening to those patients who do not have traditional risk factors [59]. Based on the results of this study, positive RAPS4 should be considered as a candidate factor prompting targeted HIV screening among Latinas.

Since positive RAPS4 is associated with increased HIV sex risk behavior among Latinas, alcohol counseling could reduce risky sexual behavior. A recent pilot study supports the feasibility of integrating a brief counseling intervention to reduce alcohol misuse and risky sexual behaviors among ED patients [44]. There is a need for more research on interventions designed to address issues of alcohol misuse and unsafe sexual activity.

One approach to improve HIV prevention may be to combine alcohol and HIV risk reduction interventions focusing on increasing self-perceived risk and condom use among ED patients. The need for effective interventions for the co-occurring problems of alcohol misuse and sexual risk behavior is suggested by our finding of an association between positive RAPS4 and HIV sex risk behaviors.

Few studies have examined a combined brief alcohol and HIV risk intervention designed to reduce both behaviors. Volkow advocated for integrating substance abuse treatment into HIV prevention to improve public health outcomes (e.g. decreasing HIV incidence) and aid in reducing HIV transmission [60]. In one randomized trial, HIV positive clinic patients were randomly assigned to a three-hour HIV-alcohol risk-reduction skills intervention or a single one-hour HIV-alcohol education control group. There was a 100% increase in condom usage or absence of sex in the lighter drinking group (77% vs. 43%; $p < 0.01$) but not in the heavier drinking group (55% vs. 59%, $p < 0.05$) [61].

Limitations

Several potential limitations could impact the results of this study. Self-reporting bias on sensitive topics such as alcohol consumption and sexual risk for HIV could lead to inaccurate data. Participants could underestimate or not recall information regarding their alcohol consumption or HIV sex risk history. However, self-report of alcohol consumption and sexual behavior is an acceptable method for obtaining this type of data [62,63].

The number of participants in this study is low and hence some relationships such as drug use could not be fully explored. In this community intravenous drug use is not common. A more highly powered study might find more correlations between drug use and risky sexual behaviors, as well as helping refine the relationships of risky sexual behaviors and positive RAPS4, positive NIAAA 'at risk' drinking and binge drinking.

In addition, we did not study Latinas under age 18. Striking associations of alcohol misuse with sexual activity would be expected among teens in El Paso. In El Paso, 64% of 8th graders report having tried alcohol [64], which is well above the national average of 28% [65]. The teen birth rate in El Paso is also above state and national averages at 69 per 1000 in teens aged 15 - 19 [66]. Hence the population under age 18 could be at even greater risk of unprotected sexual behavior and associated alcohol use.

Our sample may not have the same risk behaviors as other Hispanic ED patients. Cultural factors and behaviors vary by location, nationality and acculturation. In particular other associations with HIV sex risk behavior may be found in EDs with non-Mexican Latina populations. The population studied was from an academic public hospital and their responses may be different from patients in community emergency departments. The results of this single center study may reflect only Latinas of Mexican origin along the US/Mexico border.

We did not find a correlation between RAPS4, 'at risk' drinking or binge drinking and the behavior most related directly to HIV

transmission, unprotected intercourse. A larger study might be required to demonstrate this link, since the majority of the population studied reported unprotected intercourse. However, we did find a strong association between positive RAPS4 and HIV sex risk behaviors which have been associated with unprotected intercourse. A larger, more highly powered study would allow further refinement of the relationships between unprotected intercourse, HIV sex risk behaviors and alcohol use.

Conclusion

This is a small, detailed survey and the first to find that RAPS4 positivity is associated with HIV sex risk behavior among Latina ED patients. Those who reported positive RAPS4 were 16.6 times more likely to report HIV sex risk behaviors than RAPS4 negatives. Unsafe sexual activity places this Latina population at risk of HIV acquisition. Even so, these Latinas had no corresponding increase in concern about their HIV risk or increase in condom use. Overall about a third of these women had no knowledge of their partners' HIV status and more than half did not always discuss condom use with their partners.

Our findings suggest that sexually active Latinas who screen RAPS4 positive should be educated about safe sexual practices. Screening, brief intervention and referral to treatment (SBIRT) programs for alcohol should also address sexual practices. Counseling efforts aimed at reducing alcohol misuse could decrease HIV new infection rates by decreasing HIV sex risk behaviors, particularly if alcohol counseling interventions are expanded to promote safer sexual behavior. The effect of this approach should be studied, particularly in the Latina ED population.

Our findings also suggest that an opportunity exists in most EDs where the CDC recommendations for routine HIV screening are not being followed, to promote targeted HIV testing of Latinas who screen positive on RAPS4. In addition to HIV screening, Latina ED patients who are RAPS4 positive could benefit from safe sex and HIV risk education aimed at increasing their HIV awareness and overcoming the disconnection between their participation in HIV sex risk behavior and their lack of concern about HIV risk. Future studies are needed to determine if ED interventions can reduce HIV sex risk behavior, increase condom use and decrease HIV acquisition among Latinas.

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