

HIGH RISK BEHAVIORS AND INFECTIOUS DISEASE SPREAD AMONG ADOLESCENTS

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ABSTRACT

Aims:

Alcohol/drug abuse, risky sex, and other risky behaviors, widespread among youths, are associated with infectious disease onset/spread, mental health problems, and criminal activity. With girls engaging in risky behaviors at similar levels to boys, they face elevated risk of HIV/STD infection. Our aims: 1) Examine rates of risky behaviors and STDs among substance dependence (SD) youths entering treatment, 2) Examine predictors of risky behaviors and STDs among SD girls versus boys.

Method:

Data are from adolescents (n=195; 52% female, ages 14–18) court-referred to residential treatment for chemical dependency. Multi-method intake assessments spanned demographic, clinical, and risky sex behavior variables at intake. Gender group comparisons used Fisher's Exact Test for binary variables and Kruskal-Wallis χ^2 Test for continuous variables. Poisson loglinear modeling explored link between behaviors and STD incidence. Ordered logistic regression explored the link between variables and high-risk sexual behavior.

Results:

Minority status, felony history, years of use, sexual abuse, 3+ partners lifetime, believing drinking/sex go together, and risky sex emerged as predictors of STD incidence. Significant gender by sexual abuse interaction ($p < .0003$) emerged as a predictor of STD incidence for girls. Negative impact of sexual abuse history more pronounced among girls. Sexual abuse history and 3+ partners emerged were predictors of risky sex.

Conclusions:

Sexual abuse history is a strong indicator of infectious disease risk.

INTRODUCTION

Background:

- High prevalence of risky behaviors among youth: widespread alcohol/drug abuse, preteen sex, risky sex
- Youths' risky behaviors associated with infectious disease onset/spread, mental health problems, criminal activity
- Girls engage in risky behaviors similar to boys
 - Female social norms of being agreeable and other-oriented
 - Girls ill-prepared to care for self when engaging in risky behaviors

Study Objectives:

- Examine rates of risky behaviors and STDs among substance dependence (SD) youths entering treatment
- Examine predictors of risky behaviors and STDs among SD girls versus boys

METHOD

Subjects

- 195 youths (102 girls, 93 boys) enrolled from Feb. 2007–Aug. 2009
- Inclusion/exclusion criteria: medically detoxed (if required), no major health condition requiring hospitalization, no planned move post-treatment, aged 14-18, not currently suicidal/homicidal
- Approved by Case Medical Center Institutional Review Board
- NIAAA certificate of confidentiality obtained
- \$25 compensation for completed interviews
- Majority completed treatment (89%), 5% prematurely discharged against medical advice, 4% discharged to detention hall, 2% hospitalized for medical complications

Measures

- Multi-method intake assessments: clinician-youth-report; rater-administered interview
- Demographic variables:
 - Age, gender, minority status, ethnicity, education, parental use history, parental education
- Clinical variables:
 - Alcohol/drug dependency, age of 1st drink/drug use, PTSD, suicide attempt history (M.I.N.I.3)
 - Drinks per day, percent days abstinent, nicotine use (Timeline Follow Back Interview⁴)
 - Sexual abuse history (Childhood Sexual Abuse questionnaire^{5,6})
- Risky sex behaviors:
 - Age of 1st intercourse, number of partners, sex while drunk, risky sex (contraception use)
- STD Incidence
 - Physical exam within the last month month required for admission
 - OBGYN exam within the last 12-months required for girls
 - Medical chart review (Medical History Form^{7,8}) of STD incidence from physical exam
 - "STD ongoing/resolved?"
 - "Ever received treatment for STD?"

Statistical Analytic Plan

- SAS Version 9.29
- Gender group comparisons used Fisher's Exact Test for binary variables and Kruskal-Wallis χ^2 Test for continuous variables (Table 1).
- Of measured variables in Table 1, set of 9 explanatory variables associated with infectious disease^{9,10} were selected for linear modeling
- Models included gender interaction terms with 4 explanatory variables (Held back in school, PTSD, sexual abuse history, # sexual partners) whose effects were hypothesized to differ by gender
- Poisson loglinear model with Pearson correction for dispersion explored link between a set of explanatory variables and STD incidence (Table 3).
- Ordered logistic regression with Pearson correction for dispersion explored link between a set of explanatory variables and high-risk sexual behavior (Table 4).

TABLE 1: Demographic, Clinical, RSB Characteristics of SD Boys and Girls at Admission

Demographic variables	%	M (SD)	Total, 195 (100%)	Boys, 93 (48%)	Girls, 102 (52%)
Age	M (SD)	16.18 (1.07)	16.13 (1.08)	16.23 (1.07)	
Minority	%	59 (30%)	34 (37%)	25 (25%)	
Hispanic	%	15 (8%)	5 (5%)	10 (10%)	
Prior felonies ^a	M (SD)	0.5 (1.1)	0.7 (1.3)**	0.3 (0.7)	
Held back in school	%	27 (14%)	13 (14%)	14 (14%)	
Teen parent	%	6 (3%)	3 (3%)	3 (3%)	
Years in school	M (SD)	10.09 (1.18)	10.09 (1.27)	10.09 (1.09)	
Single parent household	%	98 (50%)	41 (44%)	57 (56%)	
Parent SD history	%	114 (58%)	51 (55%)	63 (62%)	
Parent HS diploma or less	%	87 (45%)	43 (46%)	44 (43%)	
Clinical variables					
Alcohol dependency (current)	%	118 (61%)	51 (55%)	67 (66%)	
Drug dependency (current)	%	194 (99%)	93 (100%)	101 (99%)	
Age of 1st drink	M (SD)	12.55 (2.32)	12.46 (2.49)	12.63 (2.63)	
Age of 1st drug use	M (SD)	12.71 (1.66)	12.53 (1.79)	12.87 (1.53)	
Drinks per day	M (SD)	0.61 (0.66)	0.59 (0.65)	0.63 (0.66)	
Percent days abstinent	M (SD)	0.05 (0.04)	0.05 (0.04)	0.05 (0.03)	
Nicotine use (current)	%	149 (76%)	70 (75%)	79 (77%)	
PTSD (current)	%	15 (8%)	2 (2%)	13 (13%)**	
PTSD (past)	%	36 (18%)	8 (9%)	28 (27%)***	
Suicide attempt history	%	47 (24%)	14 (15%)	33 (32%)**	
Sexual abuse history	%	50 (26%)	5 (5%)	45 (44%)***	
Risky Sex Behaviors					
SA as preteen	%	134 (69%)	52 (56%)	82 (80%)***	
Age of 1st intercourse	M (SD)	14.28 (1.66)	14.18 (1.74)	14.37 (1.57)	
Number of partners	M (SD)	2.17 (1.20)	2.11 (1.27)	2.22 (1.13)	
Sex while drunk	%	133 (68%)	59 (63%)	74 (73%)	
Risky Sex: Not SA	%	36 (18%)	20 (22%)	16 (15%)	
SA/contraception	%	39 (20%)	27 (29%)	12 (12%)	
SA/no contraception	%	120 (62%)	46 (49%)	74 (73%)**	

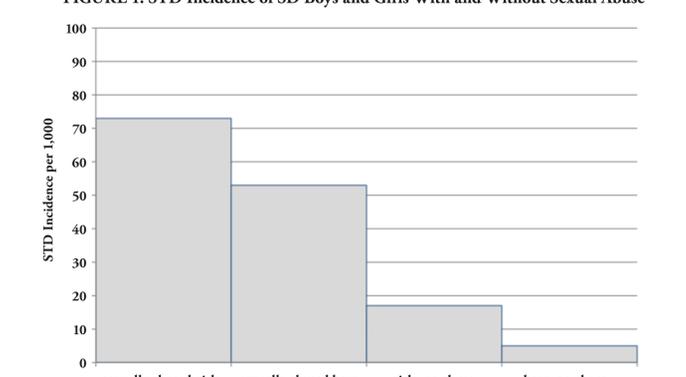
NOTES: RSB=Risky Sex Behavior; SD=substance dependent; HS=high school; SA=sexually-active; ^a24-months prior to intake
*p < 0.5 **p < 0.01 ***p < 0.001

TABLE 3: Predictors of STDs among SD Boys and Girls

Demographic variables	β	SE	Wald 95% CIs	Wald χ^2	P > χ^2
Age	0.0484	0.1658	[-0.2755, 0.3743]	0.09	0.7656
Male	-0.8642	1.3443	[-3.4990, 1.7706]	0.41	0.5203
Minority	-1.1262	0.2911	[-1.6967, -0.5558]	14.97	0.0001***
Held back in school	1.7300	2.0950	[-2.3762, 5.8361]	0.68	0.4089
Prior felonies	0.2234	0.0460	[0.1332, 0.3135]	23.56	0.0000***
Parent HS diploma or less	0.5073	0.3865	[-0.2503, 1.2649]	1.72	0.1893
Clinical variable					
Years of use	0.2275	0.1012	[0.0291, 0.4259]	5.05	0.0246
Percent days abstinent	0.0284	0.3662	[-0.6894, 0.7461]	0.01	0.9383
PTSD	-0.1128	2.1001	[-4.2289, 4.0032]	0.00	0.9572
Sexual abuse history	-2.5405	1.0331	[-4.5654, -0.5157]	6.05	0.0139*
Risky sex behaviors					
3+ sexual partners	-2.6498	0.3800	[-4.3947, -1.9049]	11.89	0.0001***
Sex when drunk	1.2406	0.7031	[0.1375, 2.6186]	3.51	0.0477
Risky sex	-2.2068	0.8039	[-3.7823, -0.6312]	7.54	0.0060**
Interactions					
Male*Held back in school	-0.0340	2.2209	[-4.3869, 4.3189]	0.00	0.9878
Male*Sex abuse history	4.0118	1.1143	[1.8279, 6.1957]	12.96	0.0003***
Male*PTSD	-0.4837	2.1207	[-4.6402, 3.6727]	0.05	0.8196
Male*Number of partners	1.0408	1.2100	[-1.0408, 2.0408]	0.79	0.3752

NOTES: STD=sexually transmitted disease; SD=substance dependent; HS=high school
*p < 0.5 **p < 0.01 ***p < 0.001

FIGURE 1: STD Incidence of SD Boys and Girls With and Without Sexual Abuse



NOTES: STD=sexually transmitted disease; SD=substance dependant ^aEstimates adjusted for demographic characteristics (age, gender, minority status, held back in school, parent HS diploma or less, prior felonies), clinical characteristics (years of use, percent days abstinent, PTSD), and risky sex behaviors (3+ partners, sex while drunk, risky sex).

TABLE 2: STD Incidence of SD Boys and Girls at Admission

STD	Total, 195 (100%)
Chlamydia	17 (9%)
Crabs	3 (2%)
Gonorrhea	11 (6%)
Hepatitis C	4 (2%)
Genital herpes	6 (3%)
HPV	15 (8%)
Syphilis	5 (3%)

NOTES: STD=sexually transmitted disease; SD=substance dependent

TABLE 4: Predictors of Risky Sex among SD Boys and Girls

Demographic variables	β	SE	Wald χ^2	P > χ^2
Age	-0.1891	0.1570	1.4499	0.2285
Male	0.5522	0.3234	2.9149	0.0878
Minority	0.1781	0.1732	1.0573	0.3038
Held back in school	0.3921	0.2397	2.6765	0.1018
Prior felonies	-0.00509	0.0665	0.0059	0.9389
Parent HS diploma or less	-0.00379	0.1811	0.0004	0.9833
Clinical variables				
Years of use	0.1885	0.1100	2.9334	0.0868
Percent days abstinent	0.1787	0.4066	0.1931	0.6604
PTSD	-0.2784	0.2496	1.2448	0.2645
Sexual abuse history	0.6490	0.2820	5.2975	0.0214*
Risky Sex Behaviors				
3+ partners	0.7379	0.1729	18.2027	0.0001***
Sex while drunk	0.1671	0.2453	0.4641	0.4957
Interactions				
Male*Held back in school	-0.2121	0.2347	0.8170	0.3661
Male*Sex abuse history	-0.2370	0.2771	0.7319	0.3923
Male*PTSD	-0.0845	0.2484	0.1158	0.7337
Male*Number of partners	-0.3635	0.1609	3.1049	0.0539

NOTES: SD=Substance-Dependent; HS=high school
*p < 0.5 **p < 0.01 ***p < 0.001

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RESULTS

Sample Profile at Intake

- Demographic Characteristics (Table 1)
 - 93 boys (48%), 102 girls (52%)
 - Average age=16 years (10th grade)
 - 30% minority, 8% Hispanic
 - 14% held back in school
 - Approximately half of youths' parents single, with SD history, HS graduate or less
 - Boys more likely to have felony history
- Clinical Characteristics (Table 1)
 - 99% with drug dependency, 60% with comorbid alcohol dependency
 - 76% smokers
 - Approximately 1 out of 4 youths enter treatment with PTSD, suicide history, sexual abuse history
 - 4 characteristics differed by gender: girls more likely to have PTSD (current & history), attempted suicide, sexually abused
- Risky Sex Behaviors (RSB; Table 1)
 - 16% had STDs (Table 2)
 - 69% had sex as preteen (< 13 years old)
 - 68% had sex while drunk
 - 62% sexually active, no contraception use
 - 2 characteristics differed by gender: girls more likely sexually-active as pre-teen (<13), sexually active without using contraception
- STD Incidence (Table 2)
 - 16% with 1+ STD
 - Most prevalent STDs: Chlamydia (9%), HPV (8%)

Predictors of STD Incidence

- Minority, felony history, years of use, sexual abuse, 3+ partners, believing drinking/sex go together, risky sex
- Significant gender by sexual abuse interaction ($p < .0003$; Table 3)
 - Negative impact of sexual abuse history more pronounced among girls (Figure 1)

Predictors of Risky Sex

- Sexual abuse history; 3+ partners (Table 4)

DISCUSSION

- 1 out of 6 youths entering treatment with 1+ STD
 - Risky sex, minority status, felony history increase STD risk
- Approximately 2 out of 3 youths having risky sex, sex while drunk
- Girls engaging in RSB similar to boys (alcohol/drug use, smoking, multiple partners, sex as preteen)
 - Sexually abused girls particularly at risk for STDs
 - Sexually abused girls particularly at risk for risky sex, consistent with prior literature¹⁰
- Study Limitations/Strengths
 - Cross-sectional study of juvenile offenders court-referred to treatment
 - Prospective investigation needed to verify findings among outpatients, normative youth populations
 - Large sample of high-risk girls (N=102), boys (N=93), minority youths (32%), multi-methods assessments
 - Future prospective research to:
 - Evaluate link between STDs, sexual abuse, dating negotiation skills
 - Efficacy of STD interventions incorporated into existing gender-specific trauma therapies

Clinical Implications

- STD, sexual abuse screening/services critical for high-risk girls and boys
 - Treatment admission critical point of entry to identify, refer youths with STDs
 - STD interventions needed for sexually abused SD youths, especially girls
 - STD education included in gender-specific trauma therapies
 - Promote assertiveness/female empowerment in navigating sexual relationships

CONCLUSIONS

- Sexual abuse history is strong indicator of infectious disease risk

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CONFLICT OF INTEREST STATEMENT

The authors and presenters report no other financial support or affiliations to disclose.

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