Predictors of Preteen Substance Use in Substance Dependent Boys and Girls

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INTRODUCTION:

Childhood substance use (SU) is linked to poor outcomes in adolescence and young adulthood. Preteen SU is associated with youth psychosocial impairment including a 2-fold risk of serious mental illness, suicide attempts, poor academic performance, and early legal problems (1). The staggering costs of preteen SU warrant investigation of precipitating environmental and individual factors. Sexual and physical abuse, familial history of substance abuse, family discord, and childhood adversity are all linked to preteen substance use (2). Individual risk factors include early cigarette use and preexisting psychiatric symptoms. Cigarette smoking increases risk of preteen illicit drug use: more than 50% of minors who smoke cigarettes have used illicit substances before age 13 (1). MDD, ADHD, CD, and Anxiety Disorders are the most common co-occurring psychiatric disorders in substance dependent youth (3). Prior work has been limited by nonclinical samples, non-representative populations selected for clinical investigations, and insufficient number of female youth with substance dependence disorder (SDD). This study is the largest clinical sample to date of substance dependent youths with equal gender representation. The purpose of this study is to examine predictors of preteen SU among substance dependent boys and girls entering residential treatment for substance dependency. **We hypothesized that: 1)** preteen substance use (PSU) will be associated with greater psychosocial impairment prior to or at time of admission **2)** specific environmental and individual factors will increase the incidence of PSU; **3)** variables linked to early age of first use will differ by gender.

METHODS:

SUBJECTS:
•Inclusion criteria: current DSM-IV diagnosis for substance dependency; English-speaking; stable address
•Exclusion criteria: current suicidality or homicidality; severe organic impairment
•University Hospitals Case Medical Center Institutional Review Board (IRB) approved
PROCEDURES:
•Medically cleared / free of withdrawal symptoms prior to admission; last use ≥3.5 weeks prior to study
•Eligible subjects consented / assented and were interviewed 2 weeks post-admission
Raters administered: MINI-Plus (semistructured diagnostic interview), Time Line Follow-Back Interview (4), Teen Treatment Services Review
•Youth and parent self reports were obtained
•Clinical assessments including medical chart review
MEASURES:
•Demographic variables
•Psychosocial variables
STATISTICAL ANALYSIS:
•Preteen Substance Use age groups defined as in Rothman, et al.
•Univariate comparisons using Fisher's Exact Test (binary variables) and Kruskal-Wallis Chi-Square Test (continuous variables)
•To decrease type II error, significant demographic and psychosocial variables from univariate comparisons were selected for regression models predicting early age of use.
•Forward, step-wise regression with main effects entered first followed by interaction terms with gender

TABLE 1: Current SDD of Boys and Girls in Residential Substance Dependency Treatment

	Total	Boys	Girls
	119 (100%)	62 (52%)	57 (48%)
ADD (current)[a]	76 (64%)	36 (58%)	40 (70%)
SDD (current)[b]	118 (99%)	62 (100%)	56 (98%)
Type of SDD (current)			
Cocaine	40 (34%)	19 (31%)	21 (37%)
Hallucinogens	42 (35%)	17 (27%)	25 (44%)
Inhalants	7 (6%)	2 (3%)	5 (9%)
Marijuana	110 (92%)	58 (94%)	52 (91%)
Narcotics	34 (29%)	14 (23%)	20 (35%)
Sedatives	24 (20%)	4 (6%) ***	20 (35%) ***
Stimulants	31 (26%)	11 (18%) *	20 (35%) *
Total # SDD (current) M (SD)	5.0 (2.0)	4.5 (1.8)	5.4 (2.1) *
Age of First Use[c] M (SD)	12.1 (2.3)	11.95 (2.5)	12.27 (2.01)

Notes: [a] AUD = Alcohol Use Disorder, [b]SUD = Substance Use Disorder; [c]Age of first use of the dependency substance; *p • .05; **p • .01, ***p • .005

RESULTS: DESCRIPTIVE:

Background Characteristics of Substance Dependent (SD) Boys and Girls:
119 SD youth aged 14-18 were enrolled in this study. Forty-eight percent (48%) were female, 48% from a single parent household, and 54% had a biological parent with a history of SDD. 35% were from a minority background, and 31% had PSU. Youths with PSU presented with higher incidence of past psychiatric comorbidity and earlier age at smoking initiation. When they entered treatment, they were more likely to be dependent on nicotine, and they were dependent upon more total substances.

TABLE 2: Psychosocial Problems Associated With Preteen Substance Use (PSU)

First Use of Dependency Substance		Total (N, %) 119 (100%)	PSU (<13) 37 (31%)	≥13 82 (69%)
Nicotine Variables				
	No. cigarettes per day	8.7 (8.8)	10.9 (10.3)*	7.7 (8.0)
	Minutes to first cigarette	79.7 (144)	43.5 (116)*	97.0 (153)
	Age of first cigarette	11.8 (2.6)	10.2 (2.5) ***	12.4 (2.3)
Ever Suicide Attempt		27 (23%)	13 (35%)*	14 (17%)
Physical Abuse		27 (23%)	9 (24%)	18 (22%)
Sexual Abuse		29 (24%)	11 (30%)	18 (22%)
Legal Variables[a]	Assault	35 (29%)	16 (43%)*	19 (23%)
	Burglary	19 (16%)	6 (16%)	13 (16%)
	DUI	2 (2%)	1 (1%)	1 (3%)
	Incarceration	77 (65%)	27 (73%)	50 (61%)
	Motor Vehicle Theft	8 (7%)	5 (14%)	3 (4%)
	Robbery	19 (16%)	10 (27%)	9 (11%)
Current # SDD[b]	M (SD)	4.9 (2.0)	5.3 (2.1)*	4.8 (2.0)
Current # Axis I disorders[c]	M (SD)	1.4 (1.1)	1.4 (1.3)	1.4 (1.0)
Past # Axis I disorders[c]	M (SD)	1.8 (1.5)	2.2 (1.8)***	1.6 (1.3)
Major Depressive Disorder				
	Current	4 (3%)	0 (0%)	4 (5%)
	Past	23 (19%)	8 (22%)	15 (18%)
	#MDD Symptoms Past	5.5 (3.7)	5.3 (4.0)	5.3 (3.6)
Posttraumatic Stress Disorder				
	Current	8 (7%)	5 (14%)	3 (4%)
	Past	22 (18%)	15 (41%)***	7 (9%)
	#PTSD Symptoms Past	3.3 (4.5)	5.9 (5.3)	2.1 (3.6)
ADHD				
Combined	Past	34 (29%)	14 (38%)	20 (24%)
Inattentive	Past	17 (14%)	4 (11%)	13 (16%)
	#ADHD Symptoms Past	4.6 (2.7)	5.4 (2.3)	4.3 (2.8)
Conduct Disorder				
	Current	85 (71%)	25 (68%)	60 (73%)
	Past	69 (58%)	26 (70%)	43 (52%)
	#CD Symptoms Past	5.13 (3.6)	6.5 (3.7)	4.5 (3.4)

Notes: [a]Legal problems accrued in two years prior to treatment; [b] SDD=Substance Dependency Disorder; [c]Axis I disorders included: depressive, anxiety, eating, disruptive behavioral disorders. *p • .05; **p • .01, ***p • .005

RESULTS: INFERENTIAL:

Predictors of Early Age of First Use in Boys and Girls:
Table 3 shows the results of a regression model using significant variables from prior univariate comparisons (Table 2) in relation to earlier age of first use among SD boys and girls. Because prior analyses demonstrate elevated past PTSD in relation to PSU, we included sexual abuse and physical abuse history in the model.

For the sample as a whole, three main effects emerged. Early age of first use was significantly related to: 1) parental history of SDD 2) younger age of cigarette use, and 3) elevated past PTSD symptoms, in both SD boys and SD girls.

Significant interaction terms with gender were found (results not shown). Boys and girls differ in the strength of the associations between elevated PTSD-symptom-count: PSU (F = 3.63, p <0.05); between history of sexual abuse : PSU (F = 3.84, p <0.05); and between Conduct Disorder : PSU (F = 3.35, p <0.05). To understand the differential relationship, we reran the model separately for boys and then again for girls (shown in Table 3). For boys, a significant link between sexual abuse and earlier age of first use emerged. For girls, a significant link between elevated past Conduct Disorder symptoms and earlier age of first use emerged. The PTSD-symptom-count: PSU link was significant for both boys and girls, but the association was stronger for girls.

TABLE 3: Predictors of Age of First Use in Boys and Girls

Variable	Total Sample F value	p	Boys F value	p	Girls F value	p
Age: first cigarette	11.64	0.0009	13.20	0.0006	2.60	0.1133
Parental SDD history	5.59	0.0199	4.22	0.0434	2.90	0.0944
# CD Symptoms (past)	1.66	0.2001	0.39	0.5357	6.44	0.0144
# PTSD symptoms (past)	5.78	0.0179	6.76	0.0119	9.52	0.0033
Physical abuse	2.92	0.10	0.59	0.45	2.85	0.11
Sexual abuse	3.26	0.055	3.65	0.04	0.10	0.75

IMPLICATIONS:

•Substance dependent (SD) boys and girls with PSU entered treatment with more psychosocial impairment, more current SDD, and more likely to have addiction to nicotine than non-PSU peers. They also had more past Axis I disorders, inclusive of PTSD and PTSD symptom count. Histories of past PTSD or of early cigarette use appear to increase vulnerability to PSU for the total sample.
•This study demonstrates that SD girls and boys differed in historical psychosocial variables that may increase the risk of earlier substance use. For boys, sexual abuse history may underscore the PTSD. For girls, conduct disorder may mediate traumatic exposures which lead to PTSD. Our study highlights the detrimental effects of earlier age at first cigarette use, extending current research that cigarettes are a gateway drug warranting further investigation (5).
•Prevention or delay of cigarette smoking may decrease PSU which will avoid the substantially worse psychosocial outcomes including more substance dependence. Diagnosing and intervening with boys and girls at risk for PTSD and addiction may divert youth from a PSU pathway. Sensitivity to gender-specific risk conditions may further improve these efforts and youth outcomes.

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