

Gender Differences in Substance Use Disorders

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Objective: The goals of this study were to explore gender differences in demographic variables, psychiatric comorbidity, and personality disorders in individuals with substance use disorders. **Method:** A total of 100 treatment-seeking substance users (50 men and 50 women) admitted to a university-based and a university-affiliated private chemical dependency hospital were compared with regard to demographic variables and comorbid psychiatric and personality diagnosis according to the Structured Clinical Interview for DSM-III-R after 14–21 days in treatment. **Results:** Men were significantly more likely to have a higher household income and to be alcohol dependent. Women were significantly more likely to have another axis I disorder in addition to substance use disorder, particularly anxiety disorders, but these gender differences were not substantially different from the gender prevalence of these disorders in the general population. Men had more affective disorders relative to women than would be expected from the general population data. Female alcoholics had substantially more psychopathology than male alcoholics, and generally these differences were consistent with the ratios of these disorders in the general population. For cocaine users, female/male ratios of anxiety and affective disorders were inconsistent with general population ratios and indicated more psychopathology than would be expected in male cocaine users. There were no gender differences in axis II diagnoses. **Conclusions:** Some of the gender differences in psychopathology in substance users are at odds with gender differences for psychopathology in the general population. Further exploration of these differences could have important theoretical and treatment implications.

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Gender differences in substance use disorders are an underinvestigated area. Previous studies indicate important differences between male and female alcoholics and cocaine and opiate users (1–3), with far-reaching assessment and treatment implications.

One area in which many important differences between male and female substance abusers have been detected is that of comorbid psychiatric diagnosis. Hesselbrock and co-workers (2) reported more depression, panic disorder, and phobia among hospitalized female alcoholics than among male alcoholics. Data from a community sample (4) of alcoholics indicate that female alcoholics have more comorbid psychiatric disorders than male alcoholics in general, and, in particular, more depression, panic disorder, and phobia. Studies of comorbid psychiatric disorders in opiate (5) and co-

caine (1, 2, 6) abusers have shown higher percentages of affective and anxiety disorders in women than in men. It is important, however, in reviewing these data to keep in mind gender differences in affective and anxiety disorders in the general population. While all of these studies show more psychopathology in female substance abusers than males, epidemiologic study data (7) indicate that in the general population, these disorders are more prevalent in women than in men. In order to distinguish gender differences that are specific to substance abusers, trends that are an exaggeration of general population differences or are in a different direction from general population differences should be explored.

The present study was designed to investigate gender differences in a group of treatment-seeking substance users. Particular attention was paid to the area of comorbid psychiatric and personality disorders.

METHOD

The subjects were 100 individuals (50 men and 50 women) admitted for inpatient treatment of substance use disorders to a university-

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TABLE 1. Demographic Characteristics of Substance-Dependent Men and Women

Item	Men (N=50)		Women (N=50)	
	N	%	N	%
Caucasian	39	78	32	64
High school education or greater	39	78	32	64
Married	16	32	13	26
Income of more than \$15,000 per year ^a	36	72	18	36
Primary alcohol dependence ^b	36	72	21	42
Primary cocaine dependence	13	26	25	50

^a $\chi^2=11.6$, $df=1$, $p\leq 0.01$.

^b $\chi^2=8.0$, $df=1$, $p\leq 0.01$.

based hospital and a university-affiliated private chemical dependency hospital. Subjects were from varied socioeconomic backgrounds and from both rural and urban settings in the greater Charleston area. Subjects were consecutively selected after completing detoxification approximately 1 week after admission. Women were oversampled in order to obtain equal gender distribution. Patients who were psychotic or demented were excluded from the study.

Between hospital days 14–21, the anxiety and affective portion of part I of the Structured Clinical Interview for DSM-III-R (SCID) (8) was administered. Seventy-six subjects (36 men and 40 women) were also administered part II (personality disorders section) of the SCID (8). The substance use portion of the SCID was amended to determine age at onset of substance dependence. All subjects were substance dependent. The primary drug of abuse was defined as the drug for which the patient currently met dependence criteria. If a patient met criteria for dependence on more than one substance, the drug of choice was designated as the primary drug of abuse. Seven subjects in the cocaine group met criteria for dependence on another substance (all alcohol) but clearly identified cocaine as their drug of choice. No patients in the alcohol group met criteria for dependence on cocaine or any other drug.

Most subjects (N=92) reported at least occasional use of more than one substance. Alcohol and marijuana were the substances most commonly used in conjunction with the primary substance of abuse. While the cocaine group commonly reported at least occasional use of alcohol (N=34 of 38 subjects), the alcohol group was less likely to report stimulant use (N=10 of 57 subjects). Only five subjects were not dependent on alcohol or cocaine (three used opiates, and two used sedative hypnotics). Subjects were given another axis I diagnosis only if the symptoms predated the onset of the substance use disorder or persisted during a period of more than 14 days of abstinence. Unpaired Student's *t* test was used to compare men and women with regard to age. Chi-square (two by two) analysis was used for comparison of socioeconomic variables and axis I and II psychopathology.

RESULTS

There were no significant gender differences in race, education, or marital status (table 1). In addition, there was not a significant difference in age (men: mean=34 years, SD=9.3; women: mean=33 years, SD=11.8). Men were significantly more likely ($p\leq 0.01$) to report a household income of >\$15,000 in the year before the interview and significantly more likely ($p\leq 0.01$) to have alcohol dependence. Although the difference was not statistically significant, women were more likely to have cocaine dependence (50%) and narcotic dependence (8%) than were men (26% and 2%, respectively).

A substantial number of men and women had other axis I psychopathology. In table 2, the gender ratios of disorders in this study are compared to the ratios in the Epidemiologic Catchment Area (ECA) Program community study (7). Women were significantly more likely than men to have an axis I diagnosis in addition to the substance use diagnosis ($p\leq 0.05$). Men and women were equally likely to be diagnosed with affective disorder; however, women were significantly more likely than men to have an anxiety disorder ($p\leq 0.05$), and there was a trend toward more posttraumatic stress disorder (PTSD) in women ($p\leq 0.10$). In addition, there was a trend toward later onset of substance dependence in women (men: mean=23 years, SD=7.2; women: mean=26 years, SD=8.8; $t=1.8$, $df=98$, $p=0.08$). Most of the PTSD was related to sexual or physical victimization. The specific area of victimization and PTSD in this population has been dealt with in another publication (9).

Table 3 displays data on psychiatric disorders in men and women according to primary drug of abuse. Alcoholic women had higher percents of all types of psychopathology. Female alcoholics were significantly more likely than male alcoholics to have an anxiety disorder ($p\leq 0.01$) and, in particular, to have panic disorder ($p\leq 0.05$). For the cocaine group, the gender differences in psychopathology were less consistent. Although it was not statistically significant, the male cocaine group had a higher percent of anxiety disorders, particularly PTSD, than the female group.

Table 4 displays the number and percent of subjects in various diagnostic groups who met criteria for an anxiety or affective disorder before the onset of the substance dependence disorder. Women were significantly more likely than men to experience the onset of panic disorder before the onset of substance dependence ($p\leq 0.05$).

A substantial percent of both men and women met criteria for axis II disorders (table 5). There were no significant gender differences in the overall prevalence of axis II disorders, antisocial personality disorder, or any specific cluster of axis II disorders.

DISCUSSION

In spite of similar educational backgrounds, men had significantly higher household income than women. This gender difference is also found in general population samples. Other investigators (3, 10) have found that male cocaine abusers were more likely to be employed, hold higher status jobs, and be self-supporting. Many of the women in the present study were single parents with primary (if not sole) responsibility for child care. Such responsibility likely interfered with earning capacity as well as access to treatment.

The finding of a higher prevalence of alcoholism among men and other drug use among women is supported by data from a community sample (7) in which men were more than five times as likely as women to have alcoholism, but only 2.6 times as likely to have

TABLE 2. Comorbid Psychiatric Disorders in Substance-Dependent Men and Women

DSM-III-R Axis I Disorder	Men (N=50)		Women (N=50)		Analysis (df=1)	Female-Male Ratio	
	N	%	N	%		Present Study	Epidemiologic Catchment Area Program (8)
Any axis I disorder	24	48	35	70	$\chi^2=4.4, p\leq 0.05$	1.5	1.9
Affective disorder	19	38	22	44	n.s.	1.2	1.9
Major depressive episode	18	36	20	40	n.s.	1.1	1.8
Bipolar disorder	3	6	2	4	n.s.	0.7	1.3
Any anxiety disorder	19	38	32	64	$\chi^2=4.9, p\leq 0.05$	1.7	2.0
Panic disorder	5	10	9	18	n.s.	1.8	2.3
Social phobia	7	14	5	10	n.s.	0.7	1.6
PTSD	12	24	23	46	$\chi^2=3.3, p\leq 0.10$	1.9	2.6

TABLE 3. Affective and Anxiety Disorders in Men and Women With Primary Cocaine or Alcohol Dependence

DSM-III-R Affective or Anxiety Disorder	Cocaine				Female-Male Ratio	Alcohol				Female-Male Ratio
	Men (N=13)		Women (N=25)			Men (N=36)		Women (N=21)		
	N	%	N	%		N	%	N	%	
Any affective disorder	4	31	8	32	1.0	11	31	13	62	2.0
Major depressive episode	3	23	7	28	1.2	15	42	11	52	1.2
Bipolar disorder	1	8	1	4	0.5	2	6	2	10	1.7
Any anxiety disorder	7	54	8	32	0.6	12	33 ^a	16	76 ^a	2.3
PTSD	6	46	7	28	0.6	6	17	8	38	2.2
Panic disorder	0	0	1	4	0.0	4	11 ^b	7	33 ^b	3.0
Social phobia	2	15	1	4	0.3	5	14	4	19	1.4

^a $\chi^2=8.1, df=1, p\leq 0.01$ ^b $\chi^2=5.6, df=1, p\leq 0.05$ **TABLE 4. Men and Women With Substance Dependence Who Met Criteria for Affective or Anxiety Disorder Before the Onset of Substance Dependence**

DSM-III-R Affective or Anxiety Disorder	All Subjects			Men			Women		
	Total	With Disorder		Total	With Disorder		Total	With Disorder	
		N	%		N	%		N	%
Any affective disorder	46	16	35	21	5	24	25	11	44
Major depressive episode	38	14	37	18	4	22	20	10	50
Bipolar disorder	8	3	38	3	1	33	5	2	40
Any anxiety disorder	53	42	79	22	16	73	31	26	84
PTSD	34	26	76	11	8	73	23	18	78
Panic disorder ^a	14	9	64	5	1	20	9	8	89
Social phobia	12	12	100	7	7	100	5	5	100

^aSignificant difference between men and women ($\chi^2=4.0, df=1, p\leq 0.05$).

other drug abuse. Further study of genetic vulnerability and transmission of drug abuse disorders may indicate that this type of gender difference reflects different genetic vulnerability to drug abuse compared to alcoholism.

While other investigators (2, 5, 10) have also reported more axis I psychopathology in female substance users than in males, it is important to view these data within the larger context of data from the general population. In the ECA study, women in the general population were nearly twice as likely as men to have an axis I disorder (7). Clearly, axis I psychopathology should be expected to be more prevalent in female substance users than in males. What these data suggest,

however, is that in the face of depression or anxiety disorders, women are no more likely than men to self-medicate with substances of abuse.

There are, however, interesting gender differences in particular diagnostic categories. Women in our population were not more likely than men to have affective disorders. This is at odds with data from the general population which indicate that major depressive disorder is approximately two times more prevalent in women than in men (7, 11). The majority of the depressed men, however, experienced the onset of depression after the onset of substance dependence. This may indicate an organically induced depression, precipitated by substance use but with continuing symptoms in spite

TABLE 5. Personality Disorders in Substance-Dependent Men and Women

DSM-III-R Axis II Disorder	Men (N=36)		Women (N=40)	
	N	%	N	%
Any axis II disorder	20	56	27	68
Antisocial personality disorder	7	19	7	18
Cluster A (paranoid, schizoid, or schizotypal personality disorder)	6	17	9	23
Cluster B (histrionic, borderline, antisocial, or narcissistic personality disorder)	17	47	19	48
Cluster C (dependent, passive-aggressive, avoidant, or obsessive-compulsive personality disorder)	16	44	16	40

of periods of discontinued use. Most studies comparing amounts of intake of both alcohol and cocaine between men and women indicate higher volume use by men (12, 13). Perhaps this greater volume of use has a more potent pharmacologic effect in inducing long-lasting affective changes.

Consistent with reports in the literature, women had significantly more anxiety disorders than men. It is important to note, however, that these differences in prevalence of anxiety disorders are not consistent with what might be expected on the basis of the gender distribution of anxiety disorders in the general population.

Social phobia was found in 12% of our population, compared to the 2.8% prevalence in the general population (14). The fact that the onset of social phobia preceded that of the substance use disorder suggests self-medication of social phobia with substances of abuse. We found no gender differences in social phobia. The ECA data (14) reported social phobia to be 1.5 times as common in women as in men. While social phobia is a risk factor for substance abuse in both sexes, for men this risk appears to be exaggerated. It may be that with the cultural expectation for men to be more aggressive socially, there is more pressure to use pharmacologic agents to overcome social phobia in men.

Our data indicate, as others have reported (15), a much higher prevalence of PTSD among substance users (35%) than in the general population (1%). It has been suggested that substance abusers place themselves at high risk for traumatic events because of their lifestyle and hence are more likely to develop PTSD as the result of such trauma (15). Others have postulated that this population may use substances of abuse for relief of painful memories of trauma and to medicate the hyperarousability, sleep disturbance, and other features of PTSD (16). Both of these hypotheses are likely to be partially true. The finding that for both men and women, the onset of the trauma and PTSD predated the onset of substance dependence in the majority of cases argues for self-medication of symptoms of PTSD in the majority of our patients.

Our data reflect a slightly higher male/female ratio of PTSD in substance users than in the general popula-

tion. This is consistent with the ECA data, which indicate that men with PTSD were five times as likely as men without PTSD to have a diagnosis of drug dependence, while women with PTSD were only 1.4 times as likely as women without PTSD to develop drug dependence (17).

When subjects were separated by primary substance of use, some interesting gender differences emerged, although these conclusions must be tempered by the fact that most of our subjects were polysubstance users. The finding that female alcoholics had higher percentages of all anxiety and affective disorders than male alcoholics is consistent with the findings of other authors (2, 18). Of interest is the fact that female/male ratios of these disorders in alcoholics are fairly close to female/male ratios in the general population for all disorders except panic disorder. The female alcoholics in the present study were three times as likely as males to have panic disorder. In the general population, panic disorder is twice as common in females as males (7). Women were significantly more likely than men to have the onset of panic disorder before the substance use disorder. It appears that panic disorder in women marks a particular vulnerability to alcohol abuse, which may be an attempt to self-medicate symptoms of panic.

In contrast, in the cocaine-dependent group there were no significant gender differences in psychopathology. Other investigators (1, 10) have also found similar prevalence rates of psychopathology in male and female cocaine abusers. For the anxiety disorders, male cocaine abusers have a higher prevalence of all disorders except panic disorder. The ECA data (7) indicate that more women than men in the general population have all of these diagnoses. It may be that cocaine, because of its anxiogenic effects, worsens the course and exaggerates the symptoms of anxiety disorders so that more problems are reported by both men and women in treatment. It is of interest that the anxiety disorder with the most dramatic gender difference is PTSD. Cottler and co-workers (15) reported that cocaine/opiate users were more likely than other substance abusers to report a traumatic event and to meet criteria for PTSD. They felt that this was explained by a combination of the dangerousness of situations in which cocaine users place themselves and the cocaine-induced exaggeration of symptoms of PTSD like jumpiness, nightmares, and sleep problems. This gender difference may have to do with the fact that male cocaine users experience more violent and dangerous situations as a result of their use than do females, with subsequent paranoia, hypervigilance, and other symptoms.

We found a nearly equal gender distribution of affective disorders in cocaine users, although in the general population, depression is twice as common in women as in men (10). Our data indicate that for both men and women, the substance use disorder predated the affective disorder in the majority of cases. Because cocaine has such potent effects on neurotransmitter systems, it may be that in many of these individuals, cocaine has precipitated depressive episodes that outlast

the duration of intoxication and acute withdrawal. Perhaps this could explain the lack of gender differentiation, since an organically precipitated affective episode may be less susceptible to gender bias than other types of depression.

It is surprising that the data on axis II disorders show remarkably similar rates of all disorders in men and women. This is of particular interest for antisocial personality disorder. A higher prevalence of antisocial personality disorder in men than in women in the general population (7), as well as in alcoholics and opiate abusers (2, 5), has been reported. However, in a recent report on psychopathology in cocaine abusers (1), no significant gender differences in antisocial personality disorder were noted. It is possible that women with drug dependence, specifically cocaine dependence, are more likely to have antisocial personality disorder. Because the majority of the women in the present study were cocaine dependent, this may partially explain the discrepancy between our data and previous studies.

It is difficult to interpret our axis II findings with respect to the general population because there are no good estimates of the prevalence of personality disorders in the general population. In a report on personality disorders in substance abusers, Nace et al. (19) found no differences in gender between groups with and without personality disorder, but they did not report on gender differences for the various personality disorders. In an unpublished report by H.M. Pettinati and co-workers, it was noted that in a group of individuals diagnosed with axis II disorders 2 weeks into treatment for substance abuse, 53% no longer met criteria for a personality disorder at 1-year follow-up. Although personality disorders are by definition enduring and pervasive, these data indicate change with recovery from substance abuse. This may mean that certain characteristics or behaviors that we use to diagnose personality disorders may be the result of substance abuse and hence clear with the discontinuation of use. This may help to explain the gender homogeneity of our data. If many of the features measured (i.e., impulsivity, erratic behavior) are results of chronic patterns of substance use and withdrawal, it follows that these characteristics would appear equally in male and female substance abusers.

In conclusion, these data accentuate the need for more rigorous exploration of gender differences in psychopathology in substance users, with particular attention to such differences in the general population. Such exploration may be helpful in clarifying some of the mechanistic questions concerning substance use, psy-

chopathology, and comorbidity, as well as having important assessment and treatment implications.

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