

BRIEF REPORTS

## Buprenorphine Versus Heroin Dependence: Comparison of Toxicologic and Psychopathologic Characteristics

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*Sociodemographic, toxicologic, and psychopathologic characteristics of 22 buprenorphine addicts and 45 heroin addicts admitted for inpatient detoxification were compared. Although the buprenorphine addicts were older, clinically significant differences were not apparent. The availability of buprenorphine may be the main reason for its abuse.*  
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**B**uprenorphine, a mixed opioid agonist-antagonist, has been shown to attenuate cocaine self-administration (1, 2) and to ameliorate depression in heroin addicts (3). Abuse of buprenorphine among opioid addicts and opioid addicts who spontaneously switched from heroin to intravenous buprenorphine has been increasingly reported (4-7). We studied whether former heroin addicts who had spontaneously switched from heroin to buprenorphine exhibited any demographic, toxicologic, or psychopathologic difference from heroin addicts.

### METHOD

We studied heroin and buprenorphine addicts admitted consecutively between October 1988 and May 1989 for inpatient detoxification. The buprenorphine abusers were former heroin addicts who had spontaneously switched from intravenous heroin self-administration to buprenorphine (mostly intravenous administration of crushed 0.2-mg tablets). The criteria for admission were opioid dependence according to DSM-III-R criteria, positive urine screening tests for heroin or buprenorphine, and previous failure of outpatient detoxification. Urine testing was carried out three times a week over the 2 weeks before admission and on the day of admission (EMIT, Syva Corp., Palo Alto, Calif.). Patients with concurrent diseases or severe psychiatric disorders were excluded. Admission to the unit was voluntary, and all subjects gave their written informed consent with the right to discontinue the program. The patients were detoxified with progressively decreasing doses of methadone (7).

The toxicologic history was evaluated by means of a structured interview during the first week of hospitalization. The psychopathologic evaluation included a clinical interview and administration of 1) the Hospital Anxiety and Depression Scale (8) before admission and on days 2, 4, and 8 after admission; 2) the Beck Depression Inventory

(9) before admission and on days 2 and 8 after admission; and 3) the SCL-90-R (10) before admission and on day 4 after hospitalization. Psychiatric diagnoses were established according to DSM-III-R criteria. Anti-HIV antibodies were measured by ELISA and confirmed by Western blot.

The results are expressed as mean and standard deviation. Statistical analyses were carried out by using the two-sample t test, the chi-square test (with Yates's continuity correction when needed), and the two-way analysis of variance (ANOVA) for repeated measures. The degrees of freedom were adjusted with the epsilon factor (Huynh-Feldt). Statistical significance was set at  $p < 0.05$ .

### RESULTS

The subjects included 22 buprenorphine abusers (17 men, five women) and 45 heroin addicts (33 men, 12 women). Their respective ages were 28.6 years (SD=4.1) and 26.3 years (SD=4.0); this difference was significant ( $t = -2.18$ ,  $df = 65$ ,  $p = 0.03$ ).

The mean length of buprenorphine self-administration was 8.13 months (range=1-24 months), and the mean total daily dose was 1.9 mg (SD=1.0) divided into three or four doses. The subjects justified the use of buprenorphine because it is an unadulterated, easily available drug that produces subjective effects very close to those of intravenous heroin. The buprenorphine addicts had begun consuming heroin at a much later age (mean=21.6 years, SD=4.3) than the subjects who were currently heroin dependent (mean=19.1 years, SD=3.6) ( $t = -2.49$ ,  $df = 65$ ,  $p = 0.02$ ). The mean durations of heroin use were similar for the two groups (7.2 versus 7.0 years). The heroin addicts used a mean of 577.2 mg (SD=465.0) of heroin per day. The mean maximum period of abstinence from heroin use was 2.6 months (SD=4.0) among the buprenorphine addicts and 6.6 months (SD=10.4) among the heroin addicts ( $t = 1.60$ ,  $df = 65$ , n.s.). No difference between the groups was found in the age at which the patients began consuming cannabis, alcohol, stimulants, cocaine, hallucinogens, or benzodiazepines. At the time of admission none of the patients was consuming amphetamines or hallucinogens. The use of alcohol, benzodiazepines, and can-

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TABLE 1. Results of Psychometric Tests for Buprenorphine and Heroin Addicts Receiving Inpatient Detoxification

Test and Time	Score				ANOVA					
	Buprenorphine Addicts (N=22) <sup>a</sup>		Heroin Addicts (N=45) <sup>a</sup>		Group-Time Interaction		Group Effect		Time Effect	
	Mean	SD	Mean	SD	F	df	F	df	F	df
Hospital Anxiety and Depression Scale										
Anxiety measure					0.51	2, 74	3.62	1, 37	28.91	2, 74
Before admission	8.6	2.9	11.4	3.6						
Day 2	8.9	4.0	10.7	4.6						
Day 8	5.0	3.3	6.5	3.7						
Depression measure					0.72	2, 74	7.17 <sup>b</sup>	1, 37	31.05	2, 74
Before admission	11.5	3.8	14.7	3.0						
Day 2	9.9	4.7	13.4	3.9						
Day 8	7.3	3.7	9.4	4.7						
Beck Depression Inventory					1.88	2, 80	3.70	1, 40	64.26	2, 80
Before admission	24.6	7.1	29.4	9.4						
Day 2	21.5	9.8	23.7	8.8						
Day 8	10.1	7.1	17.1	8.8						
SCL-90-R					0.03	1, 45	0.07	1, 45	35.59	1, 45
Before admission	1.7	0.7	1.7	0.7						
Day 4	1.2	0.7	1.2	0.7						

<sup>a</sup>Number of subjects varies because of missing data.

<sup>b</sup>p=0.01.

nabis was similar in the two groups. Fewer of the buprenorphine-dependent subjects (two of 22) than heroin addicts (14 of 44) consumed cocaine: 9% versus 32% ( $\chi^2=2.82$ , Yates's correction,  $df=1$ , n.s.).

The prevalence of HIV was 57% among the buprenorphine addicts (12 of 21) and 75% among the heroin addicts (33 of 44) ( $\chi^2=0.88$ , Yates's correction,  $df=1$ , n.s.). Most subjects consumed the drug intravenously: 91% (N=20) and 100% (N=45) of the buprenorphine and heroin addicts, respectively.

Table 1 shows the results of the repeated measure ANOVAs of the psychometric test scores of most of the buprenorphine and heroin addicts. None of the interactions between group and time of test administration for any psychometric test was significant. As expected, a time effect was observed. A diagnostic group effect was found for the depression scores on the Hospital Anxiety and Depression Scale, but the two groups did not differ significantly in mean score on the Hospital Anxiety and Depression Scale anxiety measure, the Beck Depression Inventory, or the SCL-90-R.

## DISCUSSION

Although the heroin and buprenorphine addicts in this study had been consuming opioids for similar lengths of time, the buprenorphine abusers were 2 years older on average than the heroin addicts, both when they began to consume heroin and when they were admitted to the detoxification unit. Given that the average age at which subjects in our country begin to consume heroin is 19 years (11), the patients in the buprenorphine group started consuming heroin later in life.

It is difficult to establish whether the doses of opioids used by the two groups of addicts were equivalent since

the purity of street-purchased heroin is unknown and the pharmacokinetic profile of crushed sublingual buprenorphine tablets administered intravenously has been not assessed to our knowledge.

Despite previous information (1, 2), it was not possible to confirm that the buprenorphine-dependent subjects abused less cocaine, because the patterns of poly-drug use in the two groups were similar. It has also been suggested that buprenorphine can have antidepressant effects (12), thereby making it useful in maintenance programs for heroin addicts with depressive symptoms (3). Our results, however, do not seem to support the idea that spontaneous substitution of heroin for buprenorphine could be related to depressive or any other psychopathologic symptoms. Although the buprenorphine addicts scored slightly lower than the heroin addicts on the psychometric tests, the actual magnitude of the difference was rather small. The findings reported in the literature suggesting a possible beneficial effect of buprenorphine on depression and cocaine abuse in heroin addicts were obtained from controlled trials, while this study included patients who self-administered the drug in a manner similar to that in which they would consume heroin, i.e., intravenously and probably in varying doses. The buprenorphine withdrawal syndrome was of the opioid type, began somewhat more slowly, and increased in intensity until day 5 (7).

We hypothesize that when opioid addicts spontaneously switch from heroin to buprenorphine, the availability of the drug on the market plays a stronger role than any specific effect of buprenorphine. In our study, former heroin addicts who had spontaneously switched from heroin to buprenorphine and addicts who continued to abuse heroin were not significantly different in terms of gender, toxicologic history, or psychopathologic characteristics.

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