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Clinical and laboratory observations

LSD: Patterns of use by chemically dependent adolescents

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Use of the hallucinogenic drug lysergic acid diethylamide (LSD) among adolescents is much more widespread than many pediatricians may realize. Three statewide surveys of high school upper graders showed that 10% or more of the students in those states had taken LSD.¹⁻³ We sought to determine the prevalence of LSD use by adolescents in our drug treatment facility, and the morbidity associated with use of this drug.

METHODS

Straight, Inc., is a not-for-profit, private, long-term drug treatment program for adolescents and young adults ages 12 to 22 years. The facility draws patients primarily (about 85%) from the Maryland and northern Virginia suburbs of Washington, D.C. Most patients are from the middle and upper-middle class, and 92% of the 220 adolescents in the facility were originally brought by their parents for assess-

ment of substance abuse because of dysfunctional behaviors at home, at school, and in the community; 8% of the adolescents are court-ordered to the drug treatment facility (unpublished data on 202 admissions). Usually these behaviors include violent altercations, school truancy, school failure, and out-of-control behaviors.

A 25-item multiple-choice questionnaire on LSD use was distributed simultaneously at one sitting to 179 adolescent patients present at the time of the survey at the Straight, Inc. facility in Springfield, Virginia. Before distribution of the questionnaire, it was stated to the group that participation was voluntary and that there were neither inducements to participate nor consequences for refusal to participate. Five adolescents refused to participate in this survey; 174 responded.

The 174 completed questionnaires were analyzed by a computer program designed for the study.

RESULTS

Of the 174 adolescents 14 to 18 years of age (mean age 16 years) who answered the questionnaire, none was an

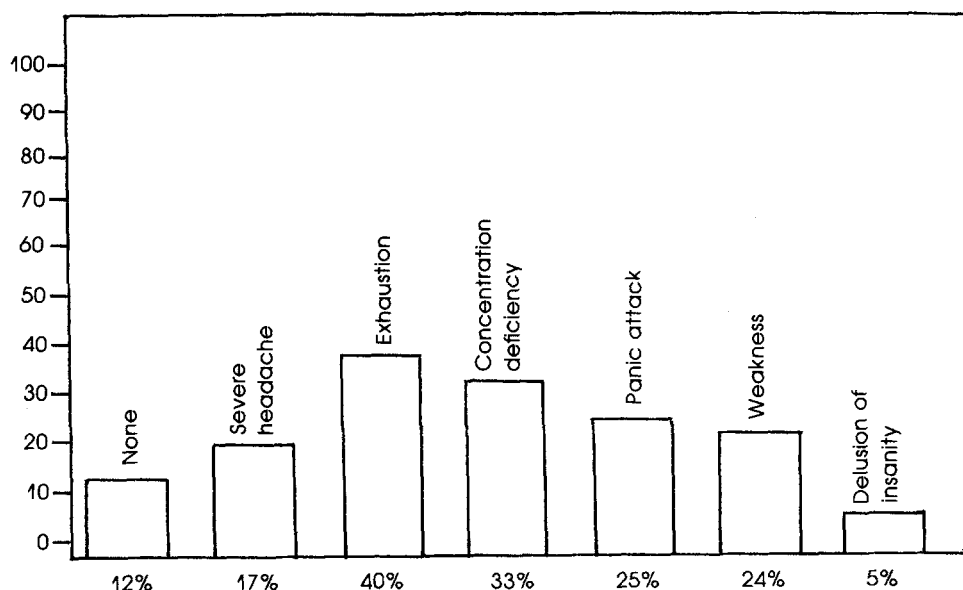


Figure. Acute physical adverse effects of LSD in 107 users.

intravenous opiate abuser. Cannabis was the primary drug of abuse for 160 of the 174 respondents, alcohol was the primary drug for 11, and cocaine for three respondents. Daily drug use was reported by approximately 60% of the 174 who primarily used cannabis and alcohol, and almost all the remaining patients had used drugs at least three times a week. The majority of respondents had experimented with several drugs of abuse. After cannabis and alcohol, LSD was the third most frequently used drug by the chemically dependent adolescents in the study.

Seventy percent ($n = 76$) of 109 boys and 47% ($n = 31$) of 65 girls had taken LSD at least once. It was reported to be the drug of choice (but not the drug used most often) by 25 (14%). Repeated LSD users included 29% of the boys and 8% of the girls. Each of these LSD abusers had taken LSD at least 30 separate times; 4% of the adolescents admitted to using it at least 100 times.

The most frequently used form of LSD in 1985 was "blotter acid": 5×5 mm squares of thin white blotting paper impregnated with LSD and usually printed with a design such as circles, elliptical eyes, pyramids, or pentagons; planets, stars, or moons in different colors; mythical figures such as unicorns; cartoon characters such as Mickey Mouse in sorcerer's apprentice garb; or musical notes. Blotter acid was the form of LSD used by 92 (86%) of the 107 LSD users, although 52 (48%) users had taken LSD in the form of small vibrantly colored tablets called "microdots." Less common forms were gelatin squares impregnated with the drug and called "window panes," and LSD drops, which were either placed in the conjunctival sac or dropped on a sugar cube and eaten.

In 1985, LSD users at Straight, Inc., reported that they

had usually paid \$4 or \$5 for a single dose. Other intoxicants such as alcohol and marijuana were often taken with LSD. Almost 50% of the respondents who tried LSD reported that they had remained under the influence of the drug for an average of 7 to 10 hours. Although LSD was not the drug of choice for most of the 174 respondents, 63% ($n = 68$) of the 107 who had tried LSD considered the drug to produce a state of intoxication that they rated "among the best" of any drug they had tried.

During the period of acute intoxication, physical symptoms such as exhaustion, inability to concentrate, or headache were reported by 87% ($n = 94$) of the 107 LSD users (Figure). Recovery from LSD was gradual, with periods of normal perception, cognition, and mood alternating with the drugged state. Fatigue, exhaustion, depression, irritability, and moodiness often persisted for 12 to 24 hours after the LSD experience. Toxic delirium (disorientation, confusion, and illusions) was experienced by 69% (74 of 107) of the LSD users, and sheer terror was experienced by 39% ($n = 42$).

The sudden appearance of Satan's face in space or on another person's body was particularly unnerving during LSD hallucinations. During the 24 hours after the LSD experience ("comedown"), 31 (29%) LSD users stated that they felt severely depressed or intensely lonely. Flashbacks were recalled by 64% ($n = 68$) of users. Usually, flashbacks were non-frightening, such as halos of light around objects, shadowlike trails of light following a moving object, vivid geometric designs within a familiar object, or distortions of sizes or shapes of faces or images. However, recurrent and particularly worrisome flashbacks (>10) were noted by 16% ($n = 17$) of the LSD users, and in two

Table. Unpleasant visual illusions or hallucinations experienced by 107 adolescent LSD users

	n	%
Acute		
Bugs or animals crawling about	19	18
Satan's face appearing	19	18
Faces of friends or strangers appearing to be dramatically aging	13	12
Flashbacks		
Stationary object in motion	44	40
Auditory illusions or hallucinations	27	24
People's faces aging	6	5
External control (by devil or others)	7	6

users these occurred daily for many months to more than 1 year after the last LSD experience (Table). Flashbacks, according to self-reports, tended to occur most frequently during stress, illness, and after vigorous exercise.

Twenty-one percent ($n = 23$) of the LSD users reported that they or a very close friend had been involved in a serious accident or had made a serious suicide attempt while intoxicated by LSD. Of the 23 accidents or suicide attempts, five resulted in the need for medical care at an emergency clinic or a hospital. In addition, seven of the 107 LSD users (three had used the drug at least 30 times) reported that they knew someone personally who had died as a result of an accident ($n = 3$), homicide ($n = 2$), or suicide ($n = 2$) during an LSD "trip."

DISCUSSION

The use of most other drugs of abuse has declined over the past 2 years, but use of LSD has remained stable, according to a recent government study.⁴ In a private pediatric practice (R.H.S.), evaluation of a questionnaire survey completed anonymously in 1984 by 225 middle-

class adolescents revealed that 8% of the respondents' best friends had tried LSD at least once (unpublished data). The survey of middle- and upper-middle-class adolescents and young adults reported here, all of whom were in a drug treatment facility, substantiates the continued use of LSD among American teenagers.

Participants in the study reported that they had often taken LSD in solitude (without a non-intoxicated person nearby to handle "bad trips"). One of three LSD users took three or more doses simultaneously, which theoretically increases the risk of negative experiences with the drug. Further, more than 60% of adolescents LSD users in the study experienced flashbacks, some of which were extremely frightening or recurring. This is consistent with the 53% frequency of flashbacks after LSD use by adults reported by Abraham.⁵

One fifth ($n = 23$) of our respondents attributed a serious injury, accident, or suicide attempt sustained or committed by themselves or a close friend directly to LSD intoxication. These responses show that use of LSD by adolescents should still be a matter of grave concern to pediatricians, and in particular, those who treat adolescents.

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Detection of adolescent substance abuse in a pediatric outpatient department: A double-blind study

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Substance abuse ranks high on the list of potential problems that should be explored when adolescents receive health and medical care services.¹ Recent surveys indicate that between 20% and 40% of high school students use